WEBVTT

- NOTE duration:"01:05:52.2130000"
- NOTE language:en-us
- NOTE Confidence: 0.71013916
- 00:00:00.000 --> 00:00:04.998 OK, welcome to the second episode of
- NOTE Confidence: 0.71013916
- $00:00:05.000 \rightarrow 00:00:10.840$  our yearly after my lecture series.
- NOTE Confidence: 0.71013916
- $00:00:10.840 \longrightarrow 00:00:15.616$  Today we are going to have
- NOTE Confidence: 0.71013916
- $00:00:15.616 \longrightarrow 00:00:17.608$  our cheaper international.
- NOTE Confidence: 0.71013916
- 00:00:17.610 --> 00:00:21.630 An ideology, namely.
- NOTE Confidence: 0.71013916
- 00:00:21.630 --> 00:00:28.410 Doctor Madoff, David Madoff, David Madoff.
- NOTE Confidence: 0.71013916
- 00:00:28.410 --> 00:00:31.315 Did his Bachelor degree and Emory University,
- NOTE Confidence: 0.71013916
- 00:00:31.320 --> 00:00:34.848 and then the MD and University speech book NOTE Confidence: 0.71013916
- $00:00:34.848 \rightarrow 00:00:37.980$  from there went to SUNY for the residency?
- NOTE Confidence: 0.71013916
- $00{:}00{:}37{.}980 \dashrightarrow 00{:}00{:}41{.}525$  It was Othello, and then a faculty
- NOTE Confidence: 0.71013916
- 00:00:41.525 --> 00:00:43.697 member at MD Anderson.
- NOTE Confidence: 0.71013916
- 00:00:43.700 --> 00:00:47.046 From MDN, Nasoni moved to we Cornell
- NOTE Confidence: 0.71013916
- 00:00:47.046 --> 00:00:49.420 Presbyterian in New York City,
- NOTE Confidence: 0.71013916
- $00:00:49.420 \longrightarrow 00:00:53.278$  where he became the section chief

 $00:00:53.278 \rightarrow 00:00:55.850$  of Interventional Radiology there

NOTE Confidence: 0.71013916

00:00:55.951 --> 00:00:59.119 and join him in July 2019 is now.

NOTE Confidence: 0.71013916

 $00{:}00{:}59{.}120 \dashrightarrow 00{:}01{:}00{.}545$  Professional radiology and

NOTE Confidence: 0.71013916

00:01:00.545 --> 00:01:01.970 medical oncology section,

NOTE Confidence: 0.71013916

 $00{:}01{:}01{.}970 \dashrightarrow 00{:}01{:}04{.}195$  chief of interventional radiology and

NOTE Confidence: 0.71013916

 $00{:}01{:}04{.}195 \dashrightarrow 00{:}01{:}07{.}523$  vice chair for visas in the Department

NOTE Confidence: 0.71013916

 $00:01:07.523 \rightarrow 00:01:11.050$  or radiology and biomedical imaging.

NOTE Confidence: 0.71013916

 $00:01:11.050 \rightarrow 00:01:13.506$  David is a great aspect in liver tumor

NOTE Confidence: 0.71013916

00:01:13.506 --> 00:01:15.440 treatment without correctional treatment,

NOTE Confidence: 0.71013916

00:01:15.440 --> 00:01:18.368 and if you look at his CV and

NOTE Confidence: 0.71013916

 $00:01:18.368 \longrightarrow 00:01:21.710$  his publication, he has been.

NOTE Confidence: 0.71013916

00:01:21.710 --> 00:01:26.180 One of the forces behind the

NOTE Confidence: 0.71013916

 $00:01:26.180 \longrightarrow 00:01:28.415$  great developments that.

NOTE Confidence: 0.71013916

 $00{:}01{:}28{.}420 \dashrightarrow 00{:}01{:}31{.}015$  I've been brought by interventional

NOTE Confidence: 0.71013916

 $00:01:31.015 \rightarrow 00:01:34.730$  radiology in the treatment of liver cancer,

 $00:01:34.730 \longrightarrow 00:01:38.118$  and he in particular is very interested

NOTE Confidence: 0.71013916

 $00:01:38.118 \dashrightarrow 00:01:43.207$  in all the method to which we can increase

NOTE Confidence: 0.71013916

 $00:01:43.207 \longrightarrow 00:01:46.320$  liver regeneration before and after

NOTE Confidence: 0.71013916

 $00:01:46.320 \longrightarrow 00:01:50.220$  surgery on Echologics surgery to deliver.

NOTE Confidence: 0.71013916

00:01:50.220 --> 00:01:52.580 David.

NOTE Confidence: 0.71013916

 $00{:}01{:}52{.}580 \dashrightarrow 00{:}01{:}56{.}492$  Is one of the members of our team

NOTE Confidence: 0.71013916

 $00:01:56.492 \rightarrow 00:02:01.150$  are as as highlighted in this slide.

NOTE Confidence: 0.71013916

00:02:01.150 --> 00:02:03.430 The treatment of Reperta

NOTE Confidence: 0.71013916

 $00{:}02{:}03{.}430 \dashrightarrow 00{:}02{:}05{.}710$  circus numbers very complex.

NOTE Confidence: 0.71013916

 $00{:}02{:}05{.}710 \dashrightarrow 00{:}02{:}08{.}570$  We have Transformers, action ablation,

NOTE Confidence: 0.71013916

 $00:02:08.570 \dashrightarrow 00:02:10.544$  radiation, systemic therapy.

NOTE Confidence: 0.71013916

 $00:02:10.544 \longrightarrow 00:02:15.150$  We need to mind also the liver

NOTE Confidence: 0.71013916

 $00{:}02{:}15.268 \dashrightarrow 00{:}02{:}19.508$  disease that is present in all if not.

NOTE Confidence: 0.71013916

 $00:02:19.510 \longrightarrow 00:02:21.118$  Most if not all,

NOTE Confidence: 0.71013916

 $00:02:21.118 \longrightarrow 00:02:22.726$  the patient liver cancer,

NOTE Confidence: 0.71013916

 $00:02:22.730 \longrightarrow 00:02:25.355$  and so it really takes a village

 $00:02:25.355 \rightarrow 00:02:28.183$  to be able to manage and treat this

NOTE Confidence: 0.71013916

 $00{:}02{:}28.183 \dashrightarrow 00{:}02{:}30.589$  patient and it is very important

NOTE Confidence: 0.71013916

 $00:02:30.589 \rightarrow 00:02:32.829$  concept that this patient should

NOTE Confidence: 0.71013916

 $00{:}02{:}32.829 \dashrightarrow 00{:}02{:}35.224$  be treated in referral centers.

NOTE Confidence: 0.71013916

 $00:02:35.230 \rightarrow 00:02:38.446$  Yeah, you can see some of our members.

NOTE Confidence: 0.71013916

 $00:02:38.450 \longrightarrow 00:02:41.285$  Actually there should be 2 times than

NOTE Confidence: 0.71013916

 $00:02:41.285 \rightarrow 00:02:43.690$  the pictures that are shown here,

NOTE Confidence: 0.71013916

 $00:02:43.690 \rightarrow 00:02:49.519$  but I don't want to take more time to our.

NOTE Confidence: 0.71013916

 $00:02:49.520 \longrightarrow 00:02:50.663$  Lecture to night then,

NOTE Confidence: 0.71013916

00:02:50.663 --> 00:02:53.330 so I'll stop here and I like

NOTE Confidence: 0.71013916

 $00:02:53.415 \longrightarrow 00:02:54.920$  the baby in the beginning.

NOTE Confidence: 0.757946888888888

 $00:03:02.040 \dashrightarrow 00:03:06.360$  Jay Silva I assume you can see my screen.

NOTE Confidence: 0.757946888888889

00:03:06.360 --> 00:03:09.900 Yep. OK, so thanks Mario for

NOTE Confidence: 0.757946888888889

 $00:03:09.900 \dashrightarrow 00:03:11.836$  that really nice introduction.

NOTE Confidence: 0.757946888888889

 $00:03:11.840 \rightarrow 00:03:15.400$  What we're going to talk about today is

 $00{:}03{:}15{.}400 \dashrightarrow 00{:}03{:}18{.}609$  local regional the rapies for liver tumors.

NOTE Confidence: 0.757946888888889

00:03:18.610 --> 00:03:22.426 A 2021 update. What I wanted to do

NOTE Confidence: 0.757946888888889

 $00{:}03{:}22{.}426 \dashrightarrow 00{:}03{:}25{.}875$  is really go through a whirlwind tour

NOTE Confidence: 0.757946888888889

 $00:03:25.875 \rightarrow 00:03:30.428$  of what IR or IO can actually offer.

NOTE Confidence: 0.757946888888889

 $00{:}03{:}30{.}430 \dashrightarrow 00{:}03{:}33{.}502$  And not necessarily bore a lot of the

NOTE Confidence: 0.757946888888889

 $00{:}03{:}33{.}502 \dashrightarrow 00{:}03{:}36{.}605$  audience with a lot of really hard core data,

NOTE Confidence: 0.757946888888889

 $00{:}03{:}36{.}610 \dashrightarrow 00{:}03{:}39{.}178$  which I definitely have, but I think to

NOTE Confidence: 0.757946888888889

 $00:03:39.178 \rightarrow 00:03:42.007$  make it more interesting and palatable,

NOTE Confidence: 0.757946888888889

 $00:03:42.010 \rightarrow 00:03:44.509$  I think that we're going to show

NOTE Confidence: 0.757946888888889

 $00{:}03{:}44{.}509 \dashrightarrow 00{:}03{:}47{.}408$  a lot of cases and make this.

NOTE Confidence: 0.757946888888889

 $00:03:47.410 \rightarrow 00:03:50.250$  I think, quite interesting.

NOTE Confidence: 0.757946888888889

 $00:03:50.250 \longrightarrow 00:03:52.690$  So these are my disclosures.

NOTE Confidence: 0.757946888888889

 $00:03:52.690 \longrightarrow 00:03:55.120$  Some of which I'm going to

NOTE Confidence: 0.757946888888889

 $00:03:55.120 \longrightarrow 00:03:57.566$  be speaking about today. So.

NOTE Confidence: 0.757946888888889

00:03:57.566 --> 00:04:00.870 As you all know.

NOTE Confidence: 0.757946888888889

 $00{:}04{:}00{.}870 \dashrightarrow 00{:}04{:}02{.}998$  Interventional radiology is involved

- NOTE Confidence: 0.757946888888889
- 00:04:02.998 --> 00:04:06.246 in numerous types of tumors, right?
- NOTE Confidence: 0.757946888888889
- $00:04:06.246 \dashrightarrow 00:04:09.762$  We treat both primary liver cancer
- NOTE Confidence: 0.757946888888889
- $00{:}04{:}09{.}762 \dashrightarrow 00{:}04{:}12.565$  and metastatic liver cancer for
- NOTE Confidence: 0.757946888888889
- $00:04:12.565 \longrightarrow 00:04:15.403$  the purpose of this talk today
- NOTE Confidence: 0.757946888888889
- 00:04:15.403 --> 00:04:18.428 to focus primarily on each CC,
- NOTE Confidence: 0.757946888888889
- $00:04:18.430 \longrightarrow 00:04:21.075$  with the understanding that a
- NOTE Confidence: 0.757946888888889
- 00:04:21.075 --> 00:04:24.458 lot of the local local regional
- NOTE Confidence: 0.757946888888889
- $00:04:24.458 \longrightarrow 00:04:27.598$  the rapies that we can offer.
- NOTE Confidence: 0.757946888888889
- 00:04:27.600 --> 00:04:30.672 Actually can be translated
- NOTE Confidence: 0.757946888888889
- $00:04:30.672 \rightarrow 00:04:33.744$  into other disease types.
- NOTE Confidence: 0.757946888888889
- $00:04:33.750 \rightarrow 00:04:36.190$  So when talking about the goals of therapy,
- NOTE Confidence: 0.757946888888889
- $00:04:36.190 \longrightarrow 00:04:37.626$  there are really 3.
- NOTE Confidence: 0.757946888888889
- $00:04:37.626 \rightarrow 00:04:40.295$  There is what you would call curative
- NOTE Confidence: 0.757946888888889
- $00{:}04{:}40.295 \dashrightarrow 00{:}04{:}43.354$  the rapy and that could be, you know,
- NOTE Confidence: 0.757946888888889
- $00{:}04{:}43{.}354 \dashrightarrow 00{:}04{:}44{.}665$  transplantation resection and
- NOTE Confidence: 0.757946888888889

 $00:04:44.665 \rightarrow 00:04:46.850$  ablation for early stage disease.

NOTE Confidence: 0.757946888888889

 $00:04:46.850 \rightarrow 00:04:49.618$  We also I guess you briefly mentioned my

NOTE Confidence: 0.757946888888889

 $00:04:49.618 \dashrightarrow 00:04:52.630$  area of interest in liver regeneration.

NOTE Confidence: 0.757946888888889

 $00:04:52.630 \longrightarrow 00:04:55.108$  We can convert patients who are

NOTE Confidence: 0.757946888888889

 $00:04:55.108 \longrightarrow 00:04:56.347$  unresectable to resectable,

NOTE Confidence: 0.757946888888889

 $00:04:56.350 \rightarrow 00:04:59.646$  and that can typically be done by portal,

NOTE Confidence: 0.757946888888888

00:04:59.650 --> 00:05:01.302 vein, embolization, radiation, lobectomy,

NOTE Confidence: 0.757946888888889

 $00:05:01.302 \rightarrow 00:05:02.954$  and transarterial emblow therapy,

NOTE Confidence: 0.757946888888889

 $00:05:02.960 \longrightarrow 00:05:05.020$  which we'll get into later.

NOTE Confidence: 0.757946888888889

 $00{:}05{:}05{.}020 \dashrightarrow 00{:}05{:}07{.}540$  And for those patients that are

NOTE Confidence: 0.757946888888889

 $00:05:07.540 \rightarrow 00:05:09.570$  of intermediate and advanced age,

NOTE Confidence: 0.757946888888889

 $00:05:09.570 \rightarrow 00:05:12.454$  we really can offer what's called palliation.

NOTE Confidence: 0.757946888888889

00:05:12.460 --> 00:05:14.148 Which is, you know,

NOTE Confidence: 0.757946888888889

 $00:05:14.148 \longrightarrow 00:05:15.836$  can be transarterial embolization

NOTE Confidence: 0.757946888888889

 $00{:}05{:}15{.}836 \dashrightarrow 00{:}05{:}17{.}390$  and or ablation.

NOTE Confidence: 0.757946888888889

 $00:05:17.390 \longrightarrow 00:05:19.721$  So all of the different types of

- NOTE Confidence: 0.757946888888889
- $00:05:19.721 \longrightarrow 00:05:21.719$  therapies that we offer really
- NOTE Confidence: 0.757946888888889
- $00:05:21.719 \rightarrow 00:05:24.049$  depends on patients tumor Histology,
- NOTE Confidence: 0.757946888888889
- $00{:}05{:}24.050 \dashrightarrow 00{:}05{:}26.402$  the number and location of the
- NOTE Confidence: 0.757946888888889
- $00:05:26.402 \longrightarrow 00:05:27.970$  tumors within the liver,
- NOTE Confidence: 0.757946888888889
- $00:05:27.970 \longrightarrow 00:05:29.930$  the extent of the underlying
- NOTE Confidence: 0.757946888888889
- $00:05:29.930 \longrightarrow 00:05:31.890$  liver disease and of course,
- NOTE Confidence: 0.757946888888889
- $00:05:31.890 \longrightarrow 00:05:34.715$  the presence or absence of
- NOTE Confidence: 0.757946888888889
- 00:05:34.715 --> 00:05:35.845 extrahepatic disease.
- NOTE Confidence: 0.757946888888889
- $00{:}05{:}35{.}850 \dashrightarrow 00{:}05{:}38{.}178$  Now what I want to do first was
- NOTE Confidence: 0.757946888888889
- $00:05:38.178 \rightarrow 00:05:40.950$  getting to the whole idea of defining
- NOTE Confidence: 0.757946888888889
- $00:05:40.950 \rightarrow 00:05:43.065$  the different types of procedures.
- NOTE Confidence: 0.757946888888889
- $00:05:43.070 \rightarrow 00:05:45.958$  It turns out that a lot of practitioners,
- NOTE Confidence: 0.757946888888889
- $00:05:45.960 \longrightarrow 00:05:48.417$  yet a lot of the time you get a
- NOTE Confidence: 0.757946888888889
- $00{:}05{:}48{.}417 \dashrightarrow 00{:}05{:}50{.}528$  lot of the types of procedures
- NOTE Confidence: 0.757946888888889
- $00:05:50.528 \dashrightarrow 00:05:53.540$  that we do kind of misinterpreted,
- NOTE Confidence: 0.757946888888889

 $00:05:53.540 \longrightarrow 00:05:55.706$  meaning that the terminology is often

NOTE Confidence: 0.757946888888889

00:05:55.706 --> 00:05:56.789 used entertained interchangeably,

NOTE Confidence: 0.757946888888889

 $00{:}05{:}56{.}790 \dashrightarrow 00{:}06{:}00{.}102$  and when you go to tumor boards or you

NOTE Confidence: 0.757946888888889

00:06:00.102 --> 00:06:02.929 listen to or you read your image Ng,

NOTE Confidence: 0.757946888888889

00:06:02.930 --> 00:06:06.360 even your image, even your image Ng.

NOTE Confidence: 0.757946888888889

 $00:06:06.360 \longrightarrow 00:06:08.400$  Reports.

NOTE Confidence: 0.757946888888889

00:06:08.400 --> 00:06:09.300 Taste, for example,

NOTE Confidence: 0.757946888888889

 $00:06:09.300 \longrightarrow 00:06:11.400$  is sometimes used in the place of

NOTE Confidence: 0.757946888888889

00:06:11.464 --> 00:06:13.448 taec or transarterial embolization,

NOTE Confidence: 0.757946888888889

 $00:06:13.450 \longrightarrow 00:06:14.164$  you know.

NOTE Confidence: 0.757946888888889

00:06:14.164 --> 00:06:15.949 See, taste is sometimes used

NOTE Confidence: 0.757946888888889

 $00:06:15.949 \longrightarrow 00:06:18.148$  for debt ace and vice versa.

NOTE Confidence: 0.757946888888889

 $00{:}06{:}18.150 \dashrightarrow 00{:}06{:}20.280$  When we talk about microwave ablation

NOTE Confidence: 0.757946888888889

 $00:06:20.280 \rightarrow 00:06:22.479$  as well as you'll hear later,

NOTE Confidence: 0.757946888888889

 $00:06:22.480 \longrightarrow 00:06:24.532$  it's always called RFA,

NOTE Confidence: 0.757946888888889

 $00:06:24.532 \rightarrow 00:06:27.097$  even if it's not really.

- NOTE Confidence: 0.757946888888889
- $00:06:27.100 \longrightarrow 00:06:28.640$  Medium embolization is sometimes
- NOTE Confidence: 0.757946888888889
- $00{:}06{:}28.640 \dashrightarrow 00{:}06{:}30.565$  referred to as radiation the rapy,
- NOTE Confidence: 0.757946888888889
- $00{:}06{:}30{.}570 \dashrightarrow 00{:}06{:}32{.}880$  and in addition you know when
- NOTE Confidence: 0.757946888888889
- $00:06:32.880 \longrightarrow 00:06:34.420$  I'm reading these reports.
- NOTE Confidence: 0.757946888888889
- $00{:}06{:}34{.}420 \dashrightarrow 00{:}06{:}36{.}891$  There's often times where will do an
- NOTE Confidence: 0.757946888888889
- $00:06:36.891 \rightarrow 00:06:38.650$  embolization where we're discussing,
- NOTE Confidence: 0.757946888888889
- 00:06:38.650 --> 00:06:39.422 you know,
- NOTE Confidence: 0.757946888888889
- $00:06:39.422 \longrightarrow 00:06:40.580$  an ablation cavity,
- NOTE Confidence: 0.757946888888889
- $00:06:40.580 \longrightarrow 00:06:42.686$  and this really isn't the case
- NOTE Confidence: 0.757946888888889
- $00:06:42.686 \longrightarrow 00:06:44.090$  and the reason why
- NOTE Confidence: 0.8533817
- $00{:}06{:}44{.}167 \dashrightarrow 00{:}06{:}47{.}151$  I'm saying this and the reason why it's
- NOTE Confidence: 0.8533817
- 00:06:47.151 --> 00:06:50.049 so important is that it really has
- NOTE Confidence: 0.8533817
- $00:06:50.049 \rightarrow 00:06:52.129$  major implications for patient care.
- NOTE Confidence: 0.8533817
- $00:06:52.130 \longrightarrow 00:06:54.050$  Medical record keeping and billing,
- NOTE Confidence: 0.8533817
- $00:06:54.050 \dashrightarrow 00:06:58.490$  so I see a lot of times where a patient may.
- NOTE Confidence: 0.8533817

 $00{:}06{:}58{.}490 \dashrightarrow 00{:}07{:}01{.}496$  Get a treatment for an image in finding and

NOTE Confidence: 0.8533817

00:07:01.496 --> 00:07:04.446 in fact it may actually not be necessary

NOTE Confidence: 0.8533817

 $00{:}07{:}04.446 \dashrightarrow 00{:}07{:}07{.}788$  and I'll get into an example of that later.

NOTE Confidence: 0.8533817

 $00{:}07{:}07{.}790 \dashrightarrow 00{:}07{:}11{.}122$  Of course, before we can even talk

NOTE Confidence: 0.8533817

00:07:11.122 $\operatorname{-->}$ 00:07:14.465 about treatment, I want to stress the

NOTE Confidence: 0.8533817

 $00{:}07{:}14.465 \dashrightarrow 00{:}07{:}16.373$  importance of percutaneous biopsy.

NOTE Confidence: 0.8533817

00:07:16.380 --> 00:07:18.795 OK now, interventional radiologists often

NOTE Confidence: 0.8533817

 $00{:}07{:}18.795 \dashrightarrow 00{:}07{:}23.047$  think of this as kind of a mundane procedure.

NOTE Confidence: 0.8533817

 $00{:}07{:}23.050 \dashrightarrow 00{:}07{:}26.190$  It's kind of basic and.

NOTE Confidence: 0.8533817

 $00{:}07{:}26.190 \dashrightarrow 00{:}07{:}28.200$  In my opinion, Proteinous biopsy is

NOTE Confidence: 0.8533817

 $00{:}07{:}28.200 \dashrightarrow 00{:}07{:}30.378$  probably one of the most important

NOTE Confidence: 0.8533817

 $00{:}07{:}30{.}378 \dashrightarrow 00{:}07{:}32{.}706$  and impactful procedures that we do.

NOTE Confidence: 0.8533817

00:07:32.710 $\operatorname{-->}$ 00:07:35.599 This is a case that I want to show

NOTE Confidence: 0.8533817

00:07:35.599 --> 00:07:38.766 which is a 64 year old female with

NOTE Confidence: 0.8533817

 $00{:}07{:}38.766 \dashrightarrow 00{:}07{:}41.092$  squamous cell cancer of the tongue

NOTE Confidence: 0.8533817

 $00{:}07{:}41.092 \dashrightarrow 00{:}07{:}43.886$  base who has a pet CT positive avid

- NOTE Confidence: 0.8533817
- $00{:}07{:}43.886 \dashrightarrow 00{:}07{:}46.414$  lesion in the left lobe of the liver

 $00:07:46.414 \dashrightarrow 00:07:49.203$  and of course because of the location

NOTE Confidence: 0.8533817

00:07:49.203 --> 00:07:50.803 because of the disease,

NOTE Confidence: 0.8533817

 $00:07:50.810 \rightarrow 00:07:53.698$  it's very important to get a diagnosis now.

NOTE Confidence: 0.8533817

 $00:07:53.700 \dashrightarrow 00:07:56.318$  We would all agree that this lesion.

NOTE Confidence: 0.8533817

 $00:07:56.320 \dashrightarrow 00:07:58.558$  It's probably very difficult to biopsy.

NOTE Confidence: 0.8533817

 $00:07:58.560 \rightarrow 00:08:00.768$  OK, it's at the very edge of the

NOTE Confidence: 0.8533817

00:08:00.768 --> 00:08:02.896 liver is literally right under

NOTE Confidence: 0.8533817

 $00{:}08{:}02.896 \dashrightarrow 00{:}08{:}04.900$  the pericardium and diaphragm,

NOTE Confidence: 0.8533817

 $00:08:04.900 \rightarrow 00:08:07.138$  and there really is no correlation

NOTE Confidence: 0.8533817

 $00:08:07.138 \longrightarrow 00:08:08.257$  with imaging findings.

NOTE Confidence: 0.8533817

00:08:08.260 --> 00:08:09.298 But you know,

NOTE Confidence: 0.8533817

 $00:08:09.298 \rightarrow 00:08:12.217$  we we were able to do the biopsy

NOTE Confidence: 0.8533817

00:08:12.217 --> 00:08:13.849 as you see here,

NOTE Confidence: 0.8533817

 $00:08:13.850 \rightarrow 00:08:17.207$  and this is actually the bottom of the heart.

- $00:08:17.210 \longrightarrow 00:08:17.548$  OK,
- NOTE Confidence: 0.8533817
- $00{:}08{:}17.548 \dashrightarrow 00{:}08{:}20.252$  and in fact the patient did not have
- NOTE Confidence: 0.8533817
- $00:08:20.252 \rightarrow 00:08:22.264$  squamous cell carcinoma but actually
- NOTE Confidence: 0.8533817
- 00:08:22.264 --> 00:08:24.664 had low grade B cell lymphoma,
- NOTE Confidence: 0.8533817
- $00:08:24.670 \rightarrow 00:08:26.660$  which completely changed the patients.
- NOTE Confidence: 0.8533817
- $00{:}08{:}26.660 \dashrightarrow 00{:}08{:}27.093$  Management.
- NOTE Confidence: 0.8533817
- $00:08:27.093 \rightarrow 00:08:31.540$  So the reason why I bring this up is that.
- NOTE Confidence: 0.8533817
- $00:08:31.540 \longrightarrow 00:08:33.310$  These procedures that you see
- NOTE Confidence: 0.8533817
- 00:08:33.310 --> 00:08:35.434 here can be very, very difficult.
- NOTE Confidence: 0.8533817
- 00:08:35.434 --> 00:08:37.194 OK from a technical perspective,
- NOTE Confidence: 0.8533817
- $00:08:37.200 \longrightarrow 00:08:39.880$  but I think that it would be very
- NOTE Confidence: 0.8533817
- $00:08:39.880 \rightarrow 00:08:41.818$  important for the referring physicians
- NOTE Confidence: 0.8533817
- $00:08:41.818 \dashrightarrow 00:08:45.623$  to actually reach out to one of us in IR
- NOTE Confidence: 0.8533817
- $00:08:45.623 \rightarrow 00:08:48.174$  to see if it's actually feasible or not.
- NOTE Confidence: 0.8533817
- $00{:}08{:}48.174 \dashrightarrow 00{:}08{:}49.590$  And in this case,
- NOTE Confidence: 0.8533817
- $00:08:49.590 \rightarrow 00:08:52.978$  I think it really helped the patients.

- NOTE Confidence: 0.8533817
- $00:08:52.980 \longrightarrow 00:08:56.390$  No diagnosis and therefore prognosis.

00:08:56.390 --> 00:09:00.179 So just to talk about HCC a little bit,

NOTE Confidence: 0.8533817

 $00:09:00.180 \dashrightarrow 00:09:02.628$  we're all aware of the Barcelona

NOTE Confidence: 0.8533817

00:09:02.628 --> 00:09:04.810 Clinic liver Cancer Staging system.

NOTE Confidence: 0.8533817

00:09:04.810 --> 00:09:05.923 As you know,

NOTE Confidence: 0.8533817

 $00{:}09{:}05{.}923 \dashrightarrow 00{:}09{:}08{.}520$  we see patients all the range from

NOTE Confidence: 0.8533817

 $00:09:08.599 \rightarrow 00:09:11.413$  very early stage or stage zero to

NOTE Confidence: 0.8533817

 $00{:}09{:}11{.}413 \dashrightarrow 00{:}09{:}14{.}596$  terminal stage or stage D and the

NOTE Confidence: 0.8533817

00:09:14.596  $-\!>$  00:09:16.961 treatments obviously fit into where

NOTE Confidence: 0.8533817

 $00:09:16.961 \dashrightarrow 00:09:19.550$  patients fall on this staging system.

NOTE Confidence: 0.8533817

 $00:09:19.550 \longrightarrow 00:09:21.535$  So typically patients that are

NOTE Confidence: 0.8533817

00:09:21.535 - 00:09:24.044 very early stage or early stage

NOTE Confidence: 0.8533817

 $00:09:24.044 \longrightarrow 00:09:25.856$  have very limited disease,

NOTE Confidence: 0.8533817

 $00{:}09{:}25.860 \dashrightarrow 00{:}09{:}27.312$  are often considered.

NOTE Confidence: 0.8533817

 $00{:}09{:}27.312 \dashrightarrow 00{:}09{:}29.732$  Or ablation resection or transplant

 $00:09:29.732 \rightarrow 00:09:32.746$  and depending on where they fall into this,

NOTE Confidence: 0.8533817

 $00{:}09{:}32.750 \dashrightarrow 00{:}09{:}36.174$  that will determine the outcome of what kind

NOTE Confidence: 0.8533817

 $00:09:36.174 \dashrightarrow 00:09:39.108$  of procedures that you would actually do.

NOTE Confidence: 0.8533817

 $00:09:39.110 \rightarrow 00:09:41.420$  Intermediate stage is what we typically

NOTE Confidence: 0.8533817

 $00:09:41.420 \longrightarrow 00:09:44.199$  do for local for regional therapy,

NOTE Confidence: 0.8533817

 $00:09:44.200 \longrightarrow 00:09:45.469$  or maybe chemoembolization

NOTE Confidence: 0.8533817

 $00:09:45.469 \longrightarrow 00:09:46.738$  or radio embolization,

NOTE Confidence: 0.8533817

 $00:09:46.740 \rightarrow 00:09:49.812$  which will get into and then systemic therapy

NOTE Confidence: 0.8533817

 $00{:}09{:}49{.}812 \dashrightarrow 00{:}09{:}52.677$  and basic supportive care are released.

NOTE Confidence: 0.8533817

 $00{:}09{:}52.680 \dashrightarrow 00{:}09{:}55.452$  It reserved for the more advanced

NOTE Confidence: 0.8533817

 $00{:}09{:}55{.}452 \dashrightarrow 00{:}09{:}58{.}667$  age is the reason why I put the.

NOTE Confidence: 0.8533817

 $00{:}09{:}58.670 \dashrightarrow 00{:}10{:}00.558$  Question mark for survival.

NOTE Confidence: 0.8533817

 $00:10:00.558 \rightarrow 00:10:04.289$  Is that we go through the gamut of.

NOTE Confidence: 0.8533817

 $00:10:04.290 \longrightarrow 00:10:06.130$  Procedures that we can offer

NOTE Confidence: 0.8533817

 $00{:}10{:}06{.}130 \dashrightarrow 00{:}10{:}07{.}970$  and then at the end

NOTE Confidence: 0.81874716

 $00:10:08.049 \rightarrow 00:10:11.316$  of the talk, we're actually going to fill in

 $00:10:11.316 \rightarrow 00:10:14.009$  where the survival actually is at this time.

NOTE Confidence: 0.81874716

00:10:14.010 --> 00:10:15.735 So there are multiple treatment

NOTE Confidence: 0.81874716

 $00{:}10{:}15{.}735 \dashrightarrow 00{:}10{:}17{.}970$  options for Liberty Mears for surgery.

NOTE Confidence: 0.81874716

00:10:17.970 - 00:10:19.690 We obviously have transplant or

NOTE Confidence: 0.81874716

 $00{:}10{:}19.690 \dashrightarrow 00{:}10{:}22.222$  hep at ectomy and we if the patient

NOTE Confidence: 0.81874716

 $00:10:22.222 \rightarrow 00:10:24.087$  has two small liver remnants,

NOTE Confidence: 0.81874716

 $00{:}10{:}24.090 \dashrightarrow 00{:}10{:}26.673$  we can optimize the future liver remnant

NOTE Confidence: 0.81874716

 $00{:}10{:}26.673 \dashrightarrow 00{:}10{:}29.486$  or FLR with a PV or something else.

NOTE Confidence: 0.81874716

 $00{:}10{:}29{.}490 \dashrightarrow 00{:}10{:}31{.}345$  Portal animalization we can talk

NOTE Confidence: 0.81874716

 $00{:}10{:}31{.}345 \dashrightarrow 00{:}10{:}33{.}995$  about a blade of techniques which are

NOTE Confidence: 0.81874716

 $00{:}10{:}33{.}995 \dashrightarrow 00{:}10{:}36{.}173$  divided into thermal and non thermal.

NOTE Confidence: 0.81874716

 $00{:}10{:}36.180 \dashrightarrow 00{:}10{:}38.208$  And for those that are thermal,

NOTE Confidence: 0.81874716

 $00{:}10{:}38{.}210 \dashrightarrow 00{:}10{:}40{.}706$  we can look at those that are heat

NOTE Confidence: 0.81874716

 $00{:}10{:}40.706 \dashrightarrow 00{:}10{:}43.299$  based in those that are cold based.

NOTE Confidence: 0.81874716

 $00{:}10{:}43{.}300 \dashrightarrow 00{:}10{:}45{.}701$  And then there's a whole host of

 $00:10:45.701 \rightarrow 00:10:47.369$  transarterial therapies we can offer,

NOTE Confidence: 0.81874716

00:10:47.370 --> 00:10:48.046 including chemo,

NOTE Confidence: 0.81874716

 $00:10:48.046 \longrightarrow 00:10:48.722$  infusion embolization,

NOTE Confidence: 0.81874716

00:10:48.722 --> 00:10:49.060 chemoembolization,

NOTE Confidence: 0.81874716

 $00{:}10{:}49.060 \dashrightarrow 00{:}10{:}52.030$  as well as radio embolization.

NOTE Confidence: 0.81874716

 $00:10:52.030 \longrightarrow 00:10:55.120$  So just to bring up local

NOTE Confidence: 0.81874716

 $00{:}10{:}55{.}120 \dashrightarrow 00{:}10{:}56{.}665$  oblated the rapies first.

NOTE Confidence: 0.81874716

 $00:10:56.670 \rightarrow 00:11:00.394$  The goal here is to percutaneously eradicate

NOTE Confidence: 0.81874716

 $00{:}11{:}00{.}394 \dashrightarrow 00{:}11{:}03{.}549$  all viable malignant cells while sparing

NOTE Confidence: 0.81874716

 $00{:}11{:}03.549 \dashrightarrow 00{:}11{:}06.986$  as much normal liver tissue as possible.

NOTE Confidence: 0.81874716

00:11:06.990 --> 00:11:09.570 We can treat tumors with

NOTE Confidence: 0.81874716

 $00:11:09.570 \longrightarrow 00:11:11.634$  unfavorable locations or patterns,

NOTE Confidence: 0.81874716

 $00:11:11.640 \longrightarrow 00:11:14.220$  patterns of distribution for resection,

NOTE Confidence: 0.81874716

 $00{:}11{:}14{.}220 \dashrightarrow 00{:}11{:}17{.}178$  or patients that have multiple comorbidities

NOTE Confidence: 0.81874716

 $00:11:17.178 \rightarrow 00:11:19.890$  that probably cannot tolerate resection,

NOTE Confidence: 0.81874716

 $00:11:19.890 \rightarrow 00:11:22.600$  but maybe have resectable disease.

- NOTE Confidence: 0.81874716
- $00:11:22.600 \longrightarrow 00:11:24.820$  It's these are most often used

 $00{:}11{:}24.820 \dashrightarrow 00{:}11{:}27.230$  in patients that have what we

NOTE Confidence: 0.81874716

 $00:11:27.230 \longrightarrow 00:11:28.938$  consider low volume disease.

NOTE Confidence: 0.81874716

 $00:11:28.940 \rightarrow 00:11:31.226$  It can be used for debulking

NOTE Confidence: 0.81874716

00:11:31.226 --> 00:11:33.290 an nowadays in recent years.

NOTE Confidence: 0.81874716

 $00{:}11{:}33{.}290 \dashrightarrow 00{:}11{:}36{.}008$  I guess we can also use it to incite

NOTE Confidence: 0.81874716

00:11:36.008 --> 00:11:38.438 antigen stimulation for immunotherapy,

NOTE Confidence: 0.81874716

 $00{:}11{:}38{.}440 \dashrightarrow 00{:}11{:}40{.}415$  and these are typically done

NOTE Confidence: 0.81874716

 $00{:}11{:}40{.}415 \dashrightarrow 00{:}11{:}41{.}995$  as outpatient and repeatable.

NOTE Confidence: 0.81874716

 $00:11:42.000 \rightarrow 00:11:45.141$  So the way we can do tumor treatment with

NOTE Confidence: 0.81874716

 $00:11:45.141 \rightarrow 00:11:47.939$  local oblated therapies is by cooking,

NOTE Confidence: 0.81874716

 $00{:}11{:}47{.}940 \dashrightarrow 00{:}11{:}50{.}316$  and that's what we would consider

NOTE Confidence: 0.81874716

00:11:50.316 --> 00:11:51.108 radio<br/>frequency ablation.

NOTE Confidence: 0.81874716

00:11:51.110 --> 00:11:52.762 We can boil them.

NOTE Confidence: 0.81874716

 $00{:}11{:}52.762 \dashrightarrow 00{:}11{:}54.827$  Which would be microwave ablation?

 $00:11:54.830 \longrightarrow 00:11:56.162$  We can freeze them,

NOTE Confidence: 0.81874716

 $00:11:56.162 \rightarrow 00:11:58.160$  which can obviously be cryo ablation

NOTE Confidence: 0.81874716

 $00:11:58.220 \longrightarrow 00:12:00.038$  or we can electrocute them and

NOTE Confidence: 0.81874716

 $00:12:00.038 \rightarrow 00:12:01.687$  that would be called irreversible

NOTE Confidence: 0.81874716

 $00{:}12{:}01.687 \dashrightarrow 00{:}12{:}03.931$  electroporation and will go into a

NOTE Confidence: 0.81874716

 $00{:}12{:}03{.}931 \dashrightarrow 00{:}12{:}08{.}068$  little bit more detail in a second.

NOTE Confidence: 0.81874716

 $00:12:08.070 \longrightarrow 00:12:11.574$  So this is a case of radiofrequency ablation.

NOTE Confidence: 0.81874716

 $00:12:11.580 \longrightarrow 00:12:14.868$  This is a 61 year old female with

NOTE Confidence: 0.81874716

 $00{:}12{:}14.868 \dashrightarrow 00{:}12{:}17.161$  colorectal cancer and an isolated

NOTE Confidence: 0.81874716

00:12:17.161 -> 00:12:19.476 metastatic tumor in segment 6.

NOTE Confidence: 0.81874716

 $00{:}12{:}19{.}480 \dashrightarrow 00{:}12{:}22{.}560$  Here we see a 2.2 centimeter tumor.

NOTE Confidence: 0.81874716

 $00:12:22.560 \longrightarrow 00:12:24.750$  Here there is an axle,

NOTE Confidence: 0.81874716

 $00:12:24.750 \longrightarrow 00:12:27.390$  the avid lesion in segment six,

NOTE Confidence: 0.81874716

 $00:12:27.390 \longrightarrow 00:12:30.018$  we place the needle proteins ablation,

NOTE Confidence: 0.81874716

 $00:12:30.020 \rightarrow 00:12:35.079$  and here is one year. Follow up OK.

NOTE Confidence: 0.81874716

 $00:12:35.080 \rightarrow 00:12:37.210$  Each major frequency ablation works is

 $00:12:37.210 \rightarrow 00:12:39.095$  that you have oscillating electrical

NOTE Confidence: 0.81874716

00:12:39.095 --> 00:12:41.130 currents via electrodes to tumor,

NOTE Confidence: 0.81874716

 $00{:}12{:}41{.}130 \dashrightarrow 00{:}12{:}43.015$  which results in a resistive

NOTE Confidence: 0.81874716

 $00{:}12{:}43.015 \dashrightarrow 00{:}12{:}44.523$  heating and tissue hyperthermia.

NOTE Confidence: 0.81874716

 $00{:}12{:}44{.}530 \dashrightarrow 00{:}12{:}46{.}415$  The tissue nearest the electrode

NOTE Confidence: 0.81874716

 $00:12:46.415 \longrightarrow 00:12:47.923$  is heated most effectively,

NOTE Confidence: 0.81874716

 $00:12:47.930 \rightarrow 00:12:50.254$  and the side of toxicity of course

NOTE Confidence: 0.81874716

 $00:12:50.254 \rightarrow 00:12:52.470$  depends on the tissue impedance.

NOTE Confidence: 0.81874716

 $00:12:52.470 \longrightarrow 00:12:54.689$  Now one of the reasons why I

NOTE Confidence: 0.81874716

 $00:12:54.689 \longrightarrow 00:12:57.293$  bring this up in the setting of

NOTE Confidence: 0.81874716

 $00{:}12{:}57{.}293 \dashrightarrow 00{:}12{:}59{.}651$  colorectal cancer is with the next

NOTE Confidence: 0.81874716

 $00{:}12{:}59{.}729 \dashrightarrow 00{:}13{:}02{.}297$  the rapy that I'm going to discuss.

NOTE Confidence: 0.81874716

 $00:13:02.300 \longrightarrow 00:13:03.608$  Radiofrequency ablation is

NOTE Confidence: 0.81874716

 $00{:}13{:}03.608 \dashrightarrow 00{:}13{:}05.788$  becoming less and less performed.

NOTE Confidence: 0.81874716

 $00:13:05.790 \longrightarrow 00:13:07.089$  And in fact,

00:13:07.089 --> 00:13:09.254 I haven't performed a radiofrequency

NOTE Confidence: 0.81874716

00:13:09.254 --> 00:13:11.747 ablation since my days at MD Anderson,

NOTE Confidence: 0.81874716

 $00{:}13{:}11.750 \dashrightarrow 00{:}13{:}14.270$  now more than 10 years ago in

NOTE Confidence: 0.81874716

 $00:13:14.270 \rightarrow 00:13:16.110$  terms of microwave ablation,

NOTE Confidence: 0.81874716

 $00:13:16.110 \longrightarrow 00:13:18.378$  this is a patient 60 year old

NOTE Confidence: 0.81874716

00:13:18.378 --> 00:13:20.253 female with HPV induced cirrhosis

NOTE Confidence: 0.81874716

 $00{:}13{:}20{.}253 \dashrightarrow 00{:}13{:}23{.}130$  and a 2 centimeter HCC in segment

NOTE Confidence: 0.81874716

 $00:13:23.130 \longrightarrow 00:13:25.638$  seven who was awaiting transplant.

NOTE Confidence: 0.81874716

 $00:13:25.640 \longrightarrow 00:13:28.016$  Here we see the lesion here,

NOTE Confidence: 0.81874716

 $00{:}13{:}28{.}020 \dashrightarrow 00{:}13{:}30{.}414$  which was simply done with microwave

NOTE Confidence: 0.81874716

 $00{:}13{:}30{.}414 \dashrightarrow 00{:}13{:}33{.}179$  ablation and a 2.7 year follow up.

NOTE Confidence: 0.80502

 $00:13:33.180 \longrightarrow 00:13:35.604$  There's no residual tumor so the

NOTE Confidence: 0.80502

 $00{:}13{:}35{.}604 \dashrightarrow 00{:}13{:}37{.}220$  way microwave ablation works.

NOTE Confidence: 0.80502

00:13:37.220 --> 00:13:39.794 Is that you can propagate microwave

NOTE Confidence: 0.80502

 $00{:}13{:}39{.}794 \dashrightarrow 00{:}13{:}41{.}980$  energy via an electromagnetic field,

NOTE Confidence: 0.80502

 $00:13:41.980 \longrightarrow 00:13:43.712$  and this induces tissue

- NOTE Confidence: 0.80502
- $00:13:43.712 \rightarrow 00:13:45.444$  hyperthermia via dielectric height,

 $00{:}13{:}45{.}450 \dashrightarrow 00{:}13{:}48{.}348$  historist hysteresis with that also means

NOTE Confidence: 0.80502

 $00{:}13{:}48{.}348 \dashrightarrow 00{:}13{:}51{.}091$  is basically you dehydrogenated the tumor NOTE Confidence: 0.80502

 $00:13:51.091 \rightarrow 00:13:53.667$  and actually cause it to rapidly shrink.

NOTE Confidence: 0.80502

 $00{:}13{:}53{.}670 \dashrightarrow 00{:}13{:}56{.}523$  This actually is done in a way where you

NOTE Confidence: 0.80502

00:13:56.523 --> 00:13:58.906 get higher ablation efficiency because

NOTE Confidence: 0.80502

 $00{:}13{:}58{.}906 \dashrightarrow 00{:}14{:}01{.}888$  you can actually get higher tissue

NOTE Confidence: 0.80502

 $00{:}14{:}01{.}969 \dashrightarrow 00{:}14{:}04{.}783$  temperatures and therefore you can get

NOTE Confidence: 0.80502

 $00{:}14{:}04.783 \dashrightarrow 00{:}14{:}07.432$  larger ablation zones with shorter times.

NOTE Confidence: 0.80502

00:14:07.432 --> 00:14:09.748 And with this kind of treatment,

NOTE Confidence: 0.80502

 $00{:}14{:}09{.}750 \dashrightarrow 00{:}14{:}11{.}460$  it readily penetrates through long

NOTE Confidence: 0.80502

 $00{:}14{:}11{.}460 \dashrightarrow 00{:}14{:}13{.}865$  or chart issue where RFA is limited NOTE Confidence: 0.80502

 $00{:}14{:}13{.}865 \dashrightarrow 00{:}14{:}16{.}091$  and it's not influenced by heat sink

NOTE Confidence: 0.80502

00:14:16.091 --> 00:14:17.808 effects in the same way RFA is.

NOTE Confidence: 0.80502

 $00{:}14{:}17.810 \dashrightarrow 00{:}14{:}20.176$  What that means is that if you

 $00:14:20.176 \rightarrow 00:14:22.746$  have a tumor that's sitting on a

NOTE Confidence: 0.80502

00:14:22.746 --> 00:14:25.427 portal vein or some kind of vessel

NOTE Confidence: 0.80502

 $00{:}14{:}25{.}427 \dashrightarrow 00{:}14{:}28{.}108$  that can draw heat away from it.

NOTE Confidence: 0.80502

00:14:28.110 --> 00:14:30.210 With microwave ablation,

NOTE Confidence: 0.80502

 $00:14:30.210 \longrightarrow 00:14:33.010$  it's actually less common.

NOTE Confidence: 0.80502

 $00{:}14{:}33{.}010 \dashrightarrow 00{:}14{:}35{.}466$  And this is just a study that just

NOTE Confidence: 0.80502

 $00{:}14{:}35{.}466 \dashrightarrow 00{:}14{:}37{.}524$  shows that there similar overall

NOTE Confidence: 0.80502

 $00{:}14{:}37{.}524 \dashrightarrow 00{:}14{:}39{.}809$  and recurrence free survival when

NOTE Confidence: 0.80502

 $00{:}14{:}39{.}809 \dashrightarrow 00{:}14{:}42{.}368$  you compare microwave ablation RFA.

NOTE Confidence: 0.80502

 $00{:}14{:}42.370 \dashrightarrow 00{:}14{:}44.812$  There was no difference in local

NOTE Confidence: 0.80502

 $00:14:44.812 \longrightarrow 00:14:45.626$  tumor progression.

NOTE Confidence: 0.80502

 $00{:}14{:}45{.}630 \dashrightarrow 00{:}14{:}47{.}665$  The technical effectiveness as well

NOTE Confidence: 0.80502

 $00{:}14{:}47.665 \dashrightarrow 00{:}14{:}49.700$  as the major complication rates.

NOTE Confidence: 0.80502

 $00{:}14{:}49{.}700 \dashrightarrow 00{:}14{:}53{.}400$  So now that we know that RFA is all it

NOTE Confidence: 0.80502

 $00{:}14{:}53{.}506 \dashrightarrow 00{:}14{:}57{.}018$  can be used as a first line the rapy.

NOTE Confidence: 0.80502

 $00:14:57.020 \longrightarrow 00:14:59.308$  So can microwave ablation.

- NOTE Confidence: 0.80502
- 00:14:59.308 --> 00:15:01.596 In terms of cryoablation,
- NOTE Confidence: 0.80502
- $00:15:01.600 \longrightarrow 00:15:04.799$  the goal here is to achieve temperatures
- NOTE Confidence: 0.80502
- $00:15:04.799 \longrightarrow 00:15:07.619$  less than 190 degrees Celsius.
- NOTE Confidence: 0.80502
- 00:15:07.620 --> 00:15:10.620 It results in direct cellular injury,
- NOTE Confidence: 0.80502
- 00:15:10.620 --> 00:15:11.836 vascular injury,
- NOTE Confidence: 0.80502
- 00:15:11.836 --> 00:15:14.268 and even immunological injury.
- NOTE Confidence: 0.80502
- $00:15:14.270 \rightarrow 00:15:16.862$  What's interesting here is that you
- NOTE Confidence: 0.80502
- $00:15:16.862 \rightarrow 00:15:19.110$  can place multiple simultaneous probes.
- NOTE Confidence: 0.80502
- 00:15:19.110 --> 00:15:21.774 You actually get in a natural
- NOTE Confidence: 0.80502
- $00:15:21.774 \longrightarrow 00:15:23.950$  an esthetic effect from the ice,
- NOTE Confidence: 0.80502
- $00:15:23.950 \rightarrow 00:15:28.670$  and as you can see from this example.
- NOTE Confidence: 0.80502
- $00{:}15{:}28.670 \dashrightarrow 00{:}15{:}30.818$  Here we see the ice ball,
- NOTE Confidence: 0.80502
- $00:15:30.820 \rightarrow 00:15:32.256$  which is easily seen,
- NOTE Confidence: 0.80502
- $00:15:32.256 \longrightarrow 00:15:34.410$  so you can actually sculpt the
- NOTE Confidence: 0.80502
- $00:15:34.479 \longrightarrow 00:15:36.549$  lesion that you want to treat.
- NOTE Confidence: 0.80502

 $00{:}15{:}36{.}550 \dashrightarrow 00{:}15{:}39{.}672$  And because of this you actually can

NOTE Confidence: 0.80502

 $00:15:39.672 \rightarrow 00:15:42.429$  get very predictable and reproducible.

NOTE Confidence: 0.80502

 $00:15:42.430 \longrightarrow 00:15:45.950$  The treatments in terms the

NOTE Confidence: 0.80502

 $00{:}15{:}45{.}950 \dashrightarrow 00{:}15{:}49{.}470$  disadvantages because there's so many.

NOTE Confidence: 0.80502

 $00{:}15{:}49{.}470 \dashrightarrow 00{:}15{:}51{.}920$  Needle probes are there that are used.

NOTE Confidence: 0.80502

 $00{:}15{:}51{.}920 \dashrightarrow 00{:}15{:}54{.}020$  You can have longer procedure times.

NOTE Confidence: 0.80502

00:15:54.020 --> 00:15:55.800 There's a theoretical bleeding risk

NOTE Confidence: 0.80502

 $00:15:55.800 \rightarrow 00:15:58.219$  and you can actually crack the liver,

NOTE Confidence: 0.80502

 $00{:}15{:}58{.}220 \dashrightarrow 00{:}15{:}59{.}970$  and patients could actually result

NOTE Confidence: 0.80502

00:15:59.970 --> 00:16:01.020 in cryo shock,

NOTE Confidence: 0.80502

 $00{:}16{:}01{.}020 \dashrightarrow 00{:}16{:}03{.}820$  which is a form of tumor lysis syndrome.

NOTE Confidence: 0.80502

 $00:16:03.820 \longrightarrow 00:16:06.292$  Now this is 1 case that I got

NOTE Confidence: 0.80502

 $00:16:06.292 \rightarrow 00:16:08.370$  from a paper from 2007,

NOTE Confidence: 0.80502

 $00{:}16{:}08{.}370 \dashrightarrow 00{:}16{:}10{.}344$  and the reason why I'm showing

NOTE Confidence: 0.80502

 $00{:}16{:}10.344 \dashrightarrow 00{:}16{:}12.824$  this like that is that I've never

NOTE Confidence: 0.80502

 $00:16:12.824 \rightarrow 00:16:15.014$  used cryo ablation in the liver,

- NOTE Confidence: 0.80502
- 00:16:15.020 --> 00:16:18.068 so I just want to show you that

 $00:16:18.068 \longrightarrow 00:16:20.518$  the example that we can do it.

NOTE Confidence: 0.80502

 $00:16:20.520 \longrightarrow 00:16:22.566$  It is being used in other

NOTE Confidence: 0.80502

 $00:16:22.566 \rightarrow 00:16:24.510$  institutions or be it rarely.

NOTE Confidence: 0.80502

 $00{:}16{:}24{.}510 \dashrightarrow 00{:}16{:}27{.}312$  And then the last one is

NOTE Confidence: 0.80502

00:16:27.312 --> 00:16:28.246 irreversible electroporation,

NOTE Confidence: 0.80502

 $00:16:28.250 \rightarrow 00:16:29.814$  so irreversible electroporation is

NOTE Confidence: 0.80502

 $00:16:29.814 \rightarrow 00:16:32.738$  a way that you can alter membrane

NOTE Confidence: 0.80502

 $00{:}16{:}32.738 \dashrightarrow 00{:}16{:}34.778$  ionic potentials and therefore

NOTE Confidence: 0.80502

00:16:34.778 --> 00:16:36.308 induce irreversible disruption

NOTE Confidence: 0.80502

 $00{:}16{:}36{.}308 \dashrightarrow 00{:}16{:}38{.}989$  of the cell membrane integrity.

NOTE Confidence: 0.80502

00:16:38.990 --> 00:16:41.516 The thought here is that this

NOTE Confidence: 0.80502

 $00{:}16{:}41{.}516 \dashrightarrow 00{:}16{:}44{.}120$  is a non thermal ablation.

NOTE Confidence: 0.80502

 $00:16:44.120 \longrightarrow 00:16:47.330$  However there are studies now.

NOTE Confidence: 0.80502

00:16:47.330 --> 00:16:48.810 They have been published,

 $00:16:48.810 \longrightarrow 00:16:50.660$  which actually does show a

NOTE Confidence: 0.80502

 $00{:}16{:}50.660 \dashrightarrow 00{:}16{:}52.660$  mild thermal component to it.

NOTE Confidence: 0.80502

 $00{:}16{:}52{.}660 \dashrightarrow 00{:}16{:}55{.}540$  So here we see a patient with cirrhosis

NOTE Confidence: 0.80502

 $00:16:55.540 \rightarrow 00:16:58.332$  and had a very challenging tumor where NOTE Confidence: 0.80502

 $00:16:58.332 \rightarrow 00:17:01.512$  you see it right here in segment 4B

NOTE Confidence: 0.80502

 $00{:}17{:}01{.}512 \dashrightarrow 00{:}17{:}04{.}088$  and it's sitting right on the bile

NOTE Confidence: 0.84893936

 $00{:}17{:}04.090 \dashrightarrow 00{:}17{:}08.034$  duct and right near the portal vein so.

NOTE Confidence: 0.84893936

 $00{:}17{:}08.040 \dashrightarrow 00{:}17{:}10.362$  So we thought that thermal ablation

NOTE Confidence: 0.84893936

 $00{:}17{:}10.362 \dashrightarrow 00{:}17{:}13.150$  with heat may be very difficult and

NOTE Confidence: 0.84893936

 $00{:}17{:}13{.}150 \dashrightarrow 00{:}17{:}16{.}273$  may result in some kind of injury to NOTE Confidence: 0.84893936

 $00:17:16.273 \longrightarrow 00:17:18.618$  the bile duct or the portal vein.

NOTE Confidence: 0.84893936

 $00{:}17{:}18.620 \dashrightarrow 00{:}17{:}20.888$  So here we see the electroporation

NOTE Confidence: 0.84893936

 $00{:}17{:}20.888 \dashrightarrow 00{:}17{:}21.644$  needles placed.

NOTE Confidence: 0.84893936

 $00{:}17{:}21.650 \dashrightarrow 00{:}17{:}24.114$  Now these need to be very symmetrical

NOTE Confidence: 0.84893936

 $00:17:24.114 \rightarrow 00:17:27.282$  with so that you get very good electrical

NOTE Confidence: 0.84893936

 $00:17:27.282 \rightarrow 00:17:30.116$  potentials across and here we see the

- NOTE Confidence: 0.84893936
- $00{:}17{:}30{.}116 \dashrightarrow 00{:}17{:}32{.}629$  tumor well treated and then at seven

 $00{:}17{:}32.629 \dashrightarrow 00{:}17{:}35.258$  months follow-up there's no tumor at all,

NOTE Confidence: 0.84893936

 $00:17:35.260 \rightarrow 00:17:38.046$  and that's a great result that's exactly.

NOTE Confidence: 0.84893936

 $00:17:38.050 \rightarrow 00:17:39.820$  What we wanted to happen.

NOTE Confidence: 0.84893936

 $00{:}17{:}39{.}820 \dashrightarrow 00{:}17{:}41{.}842$  In terms of ablation versus surgery

NOTE Confidence: 0.84893936

 $00:17:41.842 \rightarrow 00:17:43.800$  in these early stage patients,

NOTE Confidence: 0.84893936

 $00{:}17{:}43.800 \dashrightarrow 00{:}17{:}46.229$  we can see that there's survival and

NOTE Confidence: 0.84893936

 $00{:}17{:}46.229 \dashrightarrow 00{:}17{:}48.125$  recurrence recurrence free survival and

NOTE Confidence: 0.84893936

 $00:17:48.125 \rightarrow 00:17:50.110$  overall survival are not statistically

NOTE Confidence: 0.84893936

 $00:17:50.110 \longrightarrow 00:17:52.129$  significant in terms of all comers.

NOTE Confidence: 0.84893936

 $00{:}17{:}52{.}130 \dashrightarrow 00{:}17{:}53{.}578$  However, when looking at

NOTE Confidence: 0.84893936

 $00{:}17{:}53.578 \dashrightarrow 00{:}17{:}55.388$  those tumors that are central,

NOTE Confidence: 0.84893936

 $00{:}17{:}55{.}390 \dashrightarrow 00{:}17{:}57{.}918$  that means that if a patient was to

NOTE Confidence: 0.84893936

 $00{:}17{:}57{.}918$  -->  $00{:}18{:}00{.}818$  have a reception of a central tumor,

NOTE Confidence: 0.84893936

 $00:18:00.820 \rightarrow 00:18:03.130$  it would be a very large and

- $00{:}18{:}03{.}130 \dashrightarrow 00{:}18{:}04{.}586$  difficult reception that rate
- NOTE Confidence: 0.84893936
- $00:18:04.586 \rightarrow 00:18:06.606$  that ablation actually is favored,
- NOTE Confidence: 0.84893936
- $00:18:06.610 \longrightarrow 00:18:07.762$  and in fact,
- NOTE Confidence: 0.84893936
- $00:18:07.762 \rightarrow 00:18:10.900$  when you look at the major complication rate.
- NOTE Confidence: 0.84893936
- 00:18:10.900 --> 00:18:13.435 The ablation group is statistically
- NOTE Confidence: 0.84893936
- $00{:}18{:}13{.}435 \dashrightarrow 00{:}18{:}15{.}970$  significantly better than the resection.
- NOTE Confidence: 0.90414697
- $00{:}18{:}18{.}230 \dashrightarrow 00{:}18{:}18{.}970$  And then.
- NOTE Confidence: 0.88377416
- $00{:}18{:}22.740 \dashrightarrow 00{:}18{:}25.267$  Free in terms of overall and disease,
- NOTE Confidence: 0.88377416
- $00:18:25.270 \longrightarrow 00:18:27.586$  free survival, but it also looks
- NOTE Confidence: 0.88377416
- 00:18:27.586 --> 00:18:29.978 at the overall quality of Life OK,
- NOTE Confidence: 0.88377416
- $00:18:29.980 \longrightarrow 00:18:32.262$  So what they found is that there's
- NOTE Confidence: 0.88377416
- 00:18:32.262 --> 00:18:34.079 really no difference in overall
- NOTE Confidence: 0.88377416
- $00{:}18{:}34.079 \dashrightarrow 00{:}18{:}36.009$  and disease free survival when
- NOTE Confidence: 0.88377416
- $00{:}18{:}36{.}009 \dashrightarrow 00{:}18{:}37{.}939$  comparing both ablation and surgery.
- NOTE Confidence: 0.88377416
- $00:18:37.940 \rightarrow 00:18:40.238$  However, there was a significant difference
- NOTE Confidence: 0.88377416
- $00:18:40.238 \rightarrow 00:18:43.119$  in the quality of life scores such that

- NOTE Confidence: 0.88377416
- $00:18:43.119 \rightarrow 00:18:45.550$  the surgery does get a little better,
- NOTE Confidence: 0.88377416
- $00{:}18{:}45{.}550 \dashrightarrow 00{:}18{:}48{.}438$  but never to the level of the ablation.
- NOTE Confidence: 0.88377416
- $00:18:48.440 \longrightarrow 00:18:51.590$  So when we look at a lot of the
- NOTE Confidence: 0.88377416
- $00{:}18{:}51{.}590 \dashrightarrow 00{:}18{:}53{.}688$  interventional procedures that we do.
- NOTE Confidence: 0.88377416
- 00:18:53.690 --> 00:18:55.345 We're always looking at quality
- NOTE Confidence: 0.88377416
- $00{:}18{:}55{.}345 \dashrightarrow 00{:}18{:}57{.}415$  of life initiatives and then of
- NOTE Confidence: 0.88377416
- $00:18:57.415 \rightarrow 00:18:59.205$  course in these particular patients,
- NOTE Confidence: 0.88377416
- $00{:}18{:}59{.}210 \dashrightarrow 00{:}19{:}00{.}940$  again with low volume disease,
- NOTE Confidence: 0.88377416
- $00{:}19{:}00{.}940 \dashrightarrow 00{:}19{:}02{.}896$  we're always looking to treat these
- NOTE Confidence: 0.88377416
- $00:19:02.896 \rightarrow 00:19:05.080$  patients as a bridge to transplant.
- NOTE Confidence: 0.88377416
- $00{:}19{:}05{.}080 \dashrightarrow 00{:}19{:}07{.}504$  So this just is a few studies that
- NOTE Confidence: 0.88377416
- $00:19:07.504 \longrightarrow 00:19:09.738$  just shows how the results of
- NOTE Confidence: 0.88377416
- $00:19:09.738 \rightarrow 00:19:11.688$  keeping patients on the transplant
- NOTE Confidence: 0.88377416
- 00:19:11.688 --> 00:19:13.696 list so they don't drop out.
- NOTE Confidence: 0.8366912
- $00:19:16.000 \rightarrow 00:19:19.840$  So in terms of transarterial therapies.
- NOTE Confidence: 0.8366912

 $00:19:19.840 \longrightarrow 00:19:22.186$  The rationale is that most liver

NOTE Confidence: 0.8366912

00:19:22.186 --> 00:19:23.750 tumors receive blood supply

NOTE Confidence: 0.8366912

00:19:23.815 --> 00:19:25.639 largely from hepatic artery,

NOTE Confidence: 0.8366912

 $00{:}19{:}25.640 \dashrightarrow 00{:}19{:}28.112$  that these liver tumors are often

NOTE Confidence: 0.8366912

00:19:28.112 --> 00:19:29.306 hypervascular, especially HCC,

NOTE Confidence: 0.8366912

 $00{:}19{:}29{.}306 \dashrightarrow 00{:}19{:}32{.}022$  and that this new metastases are less

NOTE Confidence: 0.8366912

 $00{:}19{:}32{.}022 \dashrightarrow 00{:}19{:}34{.}736$  common than in other epithelial neoplasms.

NOTE Confidence: 0.8366912

 $00:19:34.740 \dashrightarrow 00:19:38.060$  This has been initiated over 40 years ago.

NOTE Confidence: 0.8366912

 $00{:}19{:}38.060 \dashrightarrow 00{:}19{:}40.292$  Some of the techniques we still

NOTE Confidence: 0.8366912

 $00:19:40.292 \rightarrow 00:19:43.228$  use today when I talk to patients

NOTE Confidence: 0.8366912

 $00:19:43.228 \rightarrow 00:19:45.503$  about some of these therapies,

NOTE Confidence: 0.8366912

 $00{:}19{:}45{.}510 \dashrightarrow 00{:}19{:}48{.}598$  I do tell them that some of this

NOTE Confidence: 0.8366912

 $00{:}19{:}48.598 \dashrightarrow 00{:}19{:}51.387$  the rapy has been done for decades.

NOTE Confidence: 0.8366912

 $00:19:51.390 \rightarrow 00:19:53.598$  However, it still is not the same therapy

NOTE Confidence: 0.8366912

 $00{:}19{:}53{.}598 \dashrightarrow 00{:}19{:}55{.}816$  and I'll get into that a little later.

NOTE Confidence: 0.8366912

 $00:19:55.820 \longrightarrow 00:19:58.522$  So the goal here is to selectively

- NOTE Confidence: 0.8366912
- $00{:}19{:}58{.}522 \dashrightarrow 00{:}20{:}00{.}180$  and locally deliver these.
- NOTE Confidence: 0.8366912
- $00:20:00.180 \longrightarrow 00:20:03.456$  Intra arterial the rapeutics to the tumor bed
- NOTE Confidence: 0.8366912
- $00:20:03.456 \rightarrow 00:20:05.559$  thereby effectively targeting the tumor,
- NOTE Confidence: 0.8366912
- $00:20:05.560 \rightarrow 00:20:07.800$  sparing the surrounding hepatic parenchyma
- NOTE Confidence: 0.8366912
- $00:20:07.800 \rightarrow 00:20:10.040$  and minimizing complications in toxicities.
- NOTE Confidence: 0.8366912
- 00:20:10.040 --> 00:20:12.280 But again, as we discussed,
- NOTE Confidence: 0.8366912
- $00:20:12.280 \longrightarrow 00:20:14.515$  we really need to understand
- NOTE Confidence: 0.8366912
- $00:20:14.515 \longrightarrow 00:20:16.303$  what the term tases,
- NOTE Confidence: 0.8366912
- 00:20:16.310 --> 00:20:17.216 because again,
- NOTE Confidence: 0.8366912
- $00:20:17.216 \longrightarrow 00:20:20.387$  there's a lot of difficulty within the
- NOTE Confidence: 0.8366912
- $00:20:20.387 \rightarrow 00:20:23.507$  literature and within just our own tumor
- NOTE Confidence: 0.8366912
- $00:20:23.507 \rightarrow 00:20:25.750$  boards and reporting structures that
- NOTE Confidence: 0.8366912
- $00:20:25.750 \rightarrow 00:20:28.844$  that seem to use these terms interchangeably.
- NOTE Confidence: 0.8366912
- 00:20:28.850 --> 00:20:31.090 Now, all utilized selective catheterization
- NOTE Confidence: 0.8366912
- $00{:}20{:}31.090 \dashrightarrow 00{:}20{:}33.755$  of the paddock artery branches, but.
- NOTE Confidence: 0.8366912

- $00:20:33.755 \rightarrow 00:20:35.030$  Once that's done,
- NOTE Confidence: 0.8366912
- 00:20:35.030 --> 00:20:37.155 the procedures are actually very,
- NOTE Confidence: 0.8366912
- $00:20:37.160 \longrightarrow 00:20:39.000$  very different.
- NOTE Confidence: 0.8366912
- $00:20:39.000 \longrightarrow 00:20:41.210$  So what is bland embolization?
- NOTE Confidence: 0.8366912
- 00:20:41.210 --> 00:20:42.530 Bland embolization is
- NOTE Confidence: 0.8366912
- $00:20:42.530 \rightarrow 00:20:43.850$  embolization without chemotherapy,
- NOTE Confidence: 0.8366912
- $00:20:43.850 \longrightarrow 00:20:46.060$  only using the embolic agent.
- NOTE Confidence: 0.8366912
- 00:20:46.060 00:20:48.562 The goal here is to completely
- NOTE Confidence: 0.8366912
- $00{:}20{:}48.562 \dashrightarrow 00{:}20{:}50.910$  occlude the tumor feeding vessels,
- NOTE Confidence: 0.8366912
- $00:20:50.910 \rightarrow 00:20:53.990$  which then can cause is chaemia and process.
- NOTE Confidence: 0.8366912
- 00:20:53.990 --> 00:20:55.710 Now, because of this,
- NOTE Confidence: 0.8366912
- $00:20:55.710 \longrightarrow 00:20:57.860$  the paint the procedures can
- NOTE Confidence: 0.8366912
- $00{:}20{:}57.860 \dashrightarrow 00{:}21{:}00.319$  be sometimes quite painful.
- NOTE Confidence: 0.8366912
- $00:21:00.320 \longrightarrow 00:21:02.872$  So because of the way that we do
- NOTE Confidence: 0.8366912
- $00:21:02.872 \longrightarrow 00:21:05.270$  it with very small particles,
- NOTE Confidence: 0.8366912
- $00:21:05.270 \rightarrow 00:21:08.318$  that actually leads to this kind of pain,

- NOTE Confidence: 0.8366912
- $00:21:08.320 \rightarrow 00:21:10.606$  it may have very different effects

 $00:21:10.606 \longrightarrow 00:21:11.749$  on the vasculature.

NOTE Confidence: 0.8366912

 $00:21:11.750 \rightarrow 00:21:14.417$  There's been a lot of extensive research,

NOTE Confidence: 0.8366912

 $00{:}21{:}14{.}420 \dashrightarrow 00{:}21{:}16{.}586$  but the precise effect on the

NOTE Confidence: 0.8366912

00:21:16.586 --> 00:21:18.610 tumor cells largely remain unknown,

NOTE Confidence: 0.8366912

 $00:21:18.610 \rightarrow 00:21:21.658$  and because this is done through a scheme,

NOTE Confidence: 0.8366912

00:21:21.660 --> 00:21:22.037 yeah,

NOTE Confidence: 0.8366912

00:21:22.037 --> 00:21:23.922 be hypoxic events may actually

NOTE Confidence: 0.8366912

 $00{:}21{:}23{.}922 \dashrightarrow 00{:}21{:}25{.}850$  cause activation of several genes,

NOTE Confidence: 0.8366912

00:21:25.850 --> 00:21:26.993 including veg F,

NOTE Confidence: 0.8366912

00:21:26.993 --> 00:21:29.279 which can then lead to compens,

NOTE Confidence: 0.8366912

 $00{:}21{:}29{.}280 \dashrightarrow 00{:}21{:}31{.}686$  atory, angiogenesis, and tumor growth so.

NOTE Confidence: 0.8366912

00:21:31.690 --> 00:21:32.551 Like I said,

NOTE Confidence: 0.8366912

 $00{:}21{:}32{.}551 \dashrightarrow 00{:}21{:}34{.}560$  the most common techniques that are used

NOTE Confidence: 0.8366912

 $00{:}21{:}34.615 \dashrightarrow 00{:}21{:}36.463$  are these very very small particles

00:21:36.463 - 00:21:38.570 which get very distal into the tumor.

NOTE Confidence: 0.8366912

 $00:21:38.570 \longrightarrow 00:21:39.762$  They don't actually make

NOTE Confidence: 0.8366912

 $00:21:39.762 \longrightarrow 00:21:41.252$  it to the capillary level,

NOTE Confidence: 0.8366912

 $00:21:41.260 \longrightarrow 00:21:42.750$  which may be an issue,

NOTE Confidence: 0.8366912

 $00:21:42.750 \longrightarrow 00:21:44.400$  but the goal was always really

NOTE Confidence: 0.8366912

 $00{:}21{:}44{.}400 \dashrightarrow 00{:}21{:}46{.}688$  to get to near stasis or stasis

NOTE Confidence: 0.8366912

 $00:21:46.688 \rightarrow 00:21:48.926$  while preserving flow to the larger

NOTE Confidence: 0.8366912

 $00:21:48.926 \longrightarrow 00:21:49.920$  arterial branches.

NOTE Confidence: 0.8366912

00:21:49.920 --> 00:21:52.521 This is just a case of a 61 year

NOTE Confidence: 0.8366912

 $00{:}21{:}52{.}521 \dashrightarrow 00{:}21{:}55{.}106$  old female with HCV cirrhosis who

NOTE Confidence: 0.8366912

 $00{:}21{:}55{.}106 \dashrightarrow 00{:}21{:}57{.}316$  had a 4.8 centimeter HCC.

NOTE Confidence: 0.8366912

 $00{:}21{:}57{.}320$  -->  $00{:}21{:}59{.}567$  The goal here was to embolize her

NOTE Confidence: 0.8366912

 $00{:}21{:}59{.}567 \dashrightarrow 00{:}22{:}02{.}501$  to get her as a bridge to transplant

NOTE Confidence: 0.8366912

 $00{:}22{:}02{.}501 \dashrightarrow 00{:}22{:}05{.}265$  because she was very close to being

NOTE Confidence: 0.8366912

 $00{:}22{:}05{.}265 \dashrightarrow 00{:}22{:}07{.}629$  over the five centimeters that would

NOTE Confidence: 0.8366912

 $00{:}22{:}07.629 \dashrightarrow 00{:}22{:}09.972$  keep her within the Milan criteria.

- NOTE Confidence: 0.8366912
- 00:22:09.972 --> 00:22:12.711 We did this very quickly and we

 $00:22:12.711 \longrightarrow 00:22:14.709$  were able to treat this tumor.

NOTE Confidence: 0.8366912

 $00:22:14.710 \longrightarrow 00:22:17.970$  As you can see here.

NOTE Confidence: 0.8366912

 $00:22:17.970 \rightarrow 00:22:20.646$  Totally included and then one month

NOTE Confidence: 0.8366912

 $00{:}22{:}20.646 \dashrightarrow 00{:}22{:}23.202$  later totally necrotic and now is

NOTE Confidence: 0.8366912

 $00{:}22{:}23.202 \dashrightarrow 00{:}22{:}24.240$  at 4 centimeters,

NOTE Confidence: 0.8366912

 $00:22:24.240 \longrightarrow 00:22:26.520$  so she ultimately underwent a

NOTE Confidence: 0.8366912

 $00{:}22{:}26.520 \dashrightarrow 00{:}22{:}28.800$  transplant that few months after

NOTE Confidence: 0.8366912

 $00:22:28.878 \longrightarrow 00:22:30.130$  the embolization.

NOTE Confidence: 0.8366912

 $00:22:30.130 \longrightarrow 00:22:32.790$  This is a patient that in a

NOTE Confidence: 0.8366912

00:22:32.790 --> 00:22:33.550 different location,

NOTE Confidence: 0.8366912

 $00{:}22{:}33.550 \dashrightarrow 00{:}22{:}36.100$  probably would have gotten oblated.

NOTE Confidence: 0.8366912

 $00:22:36.100 \longrightarrow 00:22:39.208$  So here we see a very small

NOTE Confidence: 0.8366912

00:22:39.208 --> 00:22:40.540 lesion in segment

NOTE Confidence: 0.8375181

 $00:22:40.643 \rightarrow 00:22:43.270 8$ . That's a solitaire E lesion that's
$00:22:43.270 \rightarrow 00:22:46.440$  very close to a budding the heart.

NOTE Confidence: 0.8375181

00:22:46.440 --> 00:22:49.936 So I thought that this would be a

NOTE Confidence: 0.8375181

 $00{:}22{:}49{.}936 \dashrightarrow 00{:}22{:}52{.}480$  very challenging lesion to a blade,

NOTE Confidence: 0.8375181

 $00{:}22{:}52{.}480 \dashrightarrow 00{:}22{:}54{.}630$  and I opted for embolization.

NOTE Confidence: 0.8375181

 $00:22:54.630 \longrightarrow 00:22:56.846$  We see the Hypervascular

NOTE Confidence: 0.8375181

 $00{:}22{:}56.846 \dashrightarrow 00{:}22{:}59.616$  territory within the artery here.

NOTE Confidence: 0.8375181

 $00:22:59.620 \longrightarrow 00:23:01.438$  At the end of the procedure,

NOTE Confidence: 0.8375181

00:23:01.440 --> 00:23:02.950 there's no more tumor blush,

NOTE Confidence: 0.8375181

 $00{:}23{:}02{.}950 \dashrightarrow 00{:}23{:}05{.}064$  and now on the post embolization MRI,

NOTE Confidence: 0.8375181

 $00{:}23{:}05{.}070 \dashrightarrow 00{:}23{:}07{.}340$  no contrast enhancement is seen.

NOTE Confidence: 0.8375181

 $00{:}23{:}07{.}340 \dashrightarrow 00{:}23{:}09{.}706$  And this is another case where this

NOTE Confidence: 0.8375181

00:23:09.706 --> 00:23:12.415 was a patient that was going to

NOTE Confidence: 0.8375181

 $00{:}23{:}12{.}415 \dashrightarrow 00{:}23{:}14{.}445$  have a combined bland embolization,

NOTE Confidence: 0.8375181

 $00{:}23{:}14.450 \dashrightarrow 00{:}23{:}16.688$  followed by portal embolization in order

NOTE Confidence: 0.8375181

 $00:23:16.688 \rightarrow 00:23:18.929$  to increase hypertrophy prior to resection.

NOTE Confidence: 0.8375181

 $00:23:18.930 \longrightarrow 00:23:21.174$  So here we see the tumor

 $00:23:21.174 \rightarrow 00:23:22.670$  we have replaced right?

NOTE Confidence: 0.8375181

 $00{:}23{:}22.670 \dashrightarrow 00{:}23{:}24.540$  Hepatic artery from the smam.

NOTE Confidence: 0.8375181

 $00{:}23{:}24{.}540 \dashrightarrow 00{:}23{:}26{.}415$  The patient was embolized with

NOTE Confidence: 0.8375181

 $00{:}23{:}26{.}415 \dashrightarrow 00{:}23{:}27{.}915$  100 Micron microspheres and

NOTE Confidence: 0.8375181

 $00{:}23{:}27{.}915 \dashrightarrow 00{:}23{:}29{.}779$  then a tolling aquatic tumor.

NOTE Confidence: 0.8375181

 $00{:}23{:}29{.}780 \dashrightarrow 00{:}23{:}32{.}482$  But in this case we actually saw

NOTE Confidence: 0.8375181

 $00:23:32.482 \longrightarrow 00:23:34.066$  significant regeneration to the

NOTE Confidence: 0.8375181

 $00:23:34.066 \longrightarrow 00:23:35.866$  point where the patient never

NOTE Confidence: 0.8375181

00:23:35.866 --> 00:23:37.760 actually needed to get there.

NOTE Confidence: 0.8375181

00:23:37.760 --> 00:23:39.875 Pve and and ultimately underwent

NOTE Confidence: 0.8375181

00:23:39.875 --> 00:23:41.144 a successful resection,

NOTE Confidence: 0.8375181

 $00{:}23{:}41{.}150 \dashrightarrow 00{:}23{:}44{.}486$  and this is just some data that I

NOTE Confidence: 0.8375181

00:23:44.486 - 00:23:47.938 wanted to to show where we see some,

NOTE Confidence: 0.8375181

 $00:23:47.940 \longrightarrow 00:23:50.060$  you know, 33% median survival.

NOTE Confidence: 0.8375181

00:23:50.060 -> 00:23:52.598 21 months, you know three years.

 $00:23:52.600 \rightarrow 00:23:54.862$  We also see some patients that

NOTE Confidence: 0.8375181

 $00{:}23{:}54.862 \dashrightarrow 00{:}23{:}56.947$  have very good response rates

NOTE Confidence: 0.8375181

 $00{:}23{:}56{.}947 \dashrightarrow 00{:}23{:}58{.}959$  and reasonable survival rates.

NOTE Confidence: 0.8375181

 $00:23:58.960 \longrightarrow 00:24:01.504$  And then when you have post

NOTE Confidence: 0.8375181

00:24:01.504 --> 00:24:02.776 op recurrence meeting,

NOTE Confidence: 0.8375181

 $00:24:02.780 \longrightarrow 00:24:07.820$  survival can be as high as 46 months.

NOTE Confidence: 0.8375181

 $00:24:07.820 \longrightarrow 00:24:10.988$  So what is conventional taste or see taste?

NOTE Confidence: 0.8375181

 $00{:}24{:}10{.}990 \dashrightarrow 00{:}24{:}13{.}000$  So conventional taste is an infusion

NOTE Confidence: 0.8375181

00:24:13.000 --> 00:24:14.960 of a mixture of chemother<br/>apeutic

NOTE Confidence: 0.8375181

 $00{:}24{:}14{.}960 \dashrightarrow 00{:}24{:}17{.}700$  agents with iodized oil followed

NOTE Confidence: 0.8375181

 $00{:}24{:}17.700 \dashrightarrow 00{:}24{:}19.892$  by embolization with microparticles

NOTE Confidence: 0.8375181

 $00{:}24{:}19{.}965 \dashrightarrow 00{:}24{:}22{.}285$  and what the oil does act as in

NOTE Confidence: 0.8375181

 $00{:}24{:}22{.}285 \dashrightarrow 00{:}24{:}24{.}366$  emulsion that functions as a vector.

NOTE Confidence: 0.8375181

 $00:24:24.366 \longrightarrow 00:24:26.236$  To carry these cytotoxic toxic

NOTE Confidence: 0.8375181

 $00{:}24{:}26{.}236 \dashrightarrow 00{:}24{:}28{.}220$  agents to the panic sinusoids

NOTE Confidence: 0.8375181

 $00:24:28.220 \rightarrow 00:24:30.150$  where drugs gradually are released

- NOTE Confidence: 0.8375181
- $00:24:30.150 \longrightarrow 00:24:31.978$  from this unstable mixture.

00:24:31.980 --> 00:24:33.560 So like I said,

NOTE Confidence: 0.8375181

 $00:24:33.560 \rightarrow 00:24:35.930$  these procedures have been done now

NOTE Confidence: 0.8375181

 $00:24:36.016 \rightarrow 00:24:38.809$  for like for more than four decades.

NOTE Confidence: 0.8375181

 $00{:}24{:}38{.}810 \dashrightarrow 00{:}24{:}41{.}925$  But when I consent or consult patients.

NOTE Confidence: 0.8375181

 $00:24:41.930 \longrightarrow 00:24:43.073$  For these procedures,

NOTE Confidence: 0.8375181

 $00:24:43.073 \longrightarrow 00:24:45.359$  I tell him that it's not.

NOTE Confidence: 0.8375181

00:24:45.360 --> 00:24:46.154 You know,

NOTE Confidence: 0.8375181

 $00{:}24{:}46.154 \dashrightarrow 00{:}24{:}46.948$  the same.

NOTE Confidence: 0.8375181

 $00:24:46.948 \longrightarrow 00:24:50.103$  We don't do it the same way as

NOTE Confidence: 0.8375181

 $00:24:50.103 \longrightarrow 00:24:51.455$  we did in 1977,

NOTE Confidence: 0.8375181

 $00{:}24{:}51{.}460 \dashrightarrow 00{:}24{:}53{.}360$  and based on the global

NOTE Confidence: 0.8375181

 $00:24:53.360 \longrightarrow 00:24:54.880$  utilization of this technique,

NOTE Confidence: 0.8375181

 $00{:}24{:}54{.}880 \dashrightarrow 00{:}24{:}56{.}320$  the Society of Interventional

NOTE Confidence: 0.8375181

 $00{:}24{:}56{.}320 \dashrightarrow 00{:}24{:}58{.}919$  Radiology has called in the first line

 $00:24:58.919 \rightarrow 00:25:00.804$  therapy for inoperable HCC patients

NOTE Confidence: 0.8375181

 $00{:}25{:}00{.}804 \dashrightarrow 00{:}25{:}02{.}890$  with well preserved liver function.

NOTE Confidence: 0.8375181

 $00:25:02.890 \longrightarrow 00:25:03.592$  So unfortunately,

NOTE Confidence: 0.8375181

 $00{:}25{:}03.592 \dashrightarrow 00{:}25{:}05.347$  at this time conventional taste

NOTE Confidence: 0.8375181

 $00:25:05.347 \longrightarrow 00:25:07.460$  is kind of non standardized.

NOTE Confidence: 0.8375181

 $00{:}25{:}07{.}460 \dashrightarrow 00{:}25{:}10{.}796$  The trend over the years has gone from

NOTE Confidence: 0.8375181

 $00{:}25{:}10.796 \dashrightarrow 00{:}25{:}13.717$  whole liver to low bar to selective.

NOTE Confidence: 0.8375181

 $00:25:13.720 \longrightarrow 00:25:16.762$  And also from occlusive to not

NOTE Confidence: 0.8375181

00:25:16.762 --> 00:25:18.283 necessarily occlusive again,

NOTE Confidence: 0.8375181

 $00:25:18.290 \longrightarrow 00:25:22.256$  the hypoxic insult may lead to

NOTE Confidence: 0.8375181

 $00:25:22.256 \rightarrow 00:25:24.900$  actually stimulation of growth

NOTE Confidence: 0.8375181

 $00:25:25.017 \rightarrow 00:25:28.377$  factors that may lead to tumor.

NOTE Confidence: 0.8375181

 $00:25:28.380 \longrightarrow 00:25:30.068$  To more tumor growth,

NOTE Confidence: 0.8375181

 $00:25:30.068 \rightarrow 00:25:31.334$  there's various chemotherapeutic

NOTE Confidence: 0.8375181

 $00{:}25{:}31{.}334 \dashrightarrow 00{:}25{:}33{.}540$  regimens and actually in 2019

NOTE Confidence: 0.8375181

 $00{:}25{:}33{.}540 \dashrightarrow 00{:}25{:}35{.}292$  in the Journal cardiovascular

- NOTE Confidence: 0.8375181
- 00:25:35.292 --> 00:25:36.168 Interventional Radiology,
- NOTE Confidence: 0.8375181
- $00{:}25{:}36{.}170 \dashrightarrow 00{:}25{:}38{.}996$  there was a global survey which
- NOTE Confidence: 0.8375181
- $00:25:38.996 \rightarrow 00:25:41.334$  basically showed that there's lots
- NOTE Confidence: 0.8375181
- $00:25:41.334 \rightarrow 00:25:43.966$  of different ways you can do this,
- NOTE Confidence: 0.8375181
- $00{:}25{:}43{.}970 \dashrightarrow 00{:}25{:}47{.}036$  But the most common embolic agents that
- NOTE Confidence: 0.8375181
- 00:25:47.036 00:25:50.457 we use these days are again our LOPI,
- NOTE Confidence: 0.8375181
- 00:25:50.460 --> 00:25:52.630 Dolores Idol, PVA gel foam,
- NOTE Confidence: 0.8375181
- $00{:}25{:}52{.}630 \dashrightarrow 00{:}25{:}55{.}348$  and some others.
- NOTE Confidence: 0.8375181
- $00{:}25{:}55{.}350 \dashrightarrow 00{:}25{:}59{.}542$  So this is one of the two landmark
- NOTE Confidence: 0.8375181
- 00:25:59.542 --> 00:26:01.390 randomized control trials,
- NOTE Confidence: 0.8375181
- $00:26:01.390 \longrightarrow 00:26:05.180$  first showing the benefit of.
- NOTE Confidence: 0.8375181
- 00:26:05.180 --> 00:26:06.440 Embolization it's interesting
- NOTE Confidence: 0.8375181
- $00:26:06.440 \longrightarrow 00:26:08.540$  that the procedure was performed
- NOTE Confidence: 0.8375181
- $00:26:08.540 \longrightarrow 00:26:10.824$  for 25 years before we actually
- NOTE Confidence: 0.8375181
- $00:26:10.824 \rightarrow 00:26:12.549$  were able to show benefit.
- NOTE Confidence: 0.8375181

 $00:26:12.550 \longrightarrow 00:26:14.866$  This was a study that was

NOTE Confidence: 0.8375181

00:26:14.866 --> 00:26:16.410 performed from the Barcelona

NOTE Confidence: 0.84367865

 $00{:}26{:}16.486$  -->  $00{:}26{:}19.630$  Cancer Center and it showed largely that it NOTE Confidence: 0.84367865

 $00:26:19.630 \rightarrow 00:26:22.635$  was working in a select group of patients.

NOTE Confidence: 0.84367865

00:26:22.640 --> 00:26:25.736 112 out of 903 that had well encapsulated,

NOTE Confidence: 0.84367865

 $00{:}26{:}25{.}740 \dashrightarrow 00{:}26{:}28{.}246$  smaller sized tumors in patients with good NOTE Confidence: 0.84367865

00:26:28.246 --> 00:26:30.788 liver function and good performance status.

NOTE Confidence: 0.84367865

 $00:26:30.790 \longrightarrow 00:26:33.814$  So that was one way that we were

NOTE Confidence: 0.84367865

 $00{:}26{:}33{.}814 \dashrightarrow 00{:}26{:}36{.}467$  able to justify the use of.

NOTE Confidence: 0.84367865

 $00:26:36.470 \rightarrow 00:26:39.459$  Conventional taste and this was another study

NOTE Confidence: 0.84367865

 $00:26:39.459 \rightarrow 00:26:42.349$  that was performed in an Asian population,

NOTE Confidence: 0.84367865

00:26:42.350 --> 00:26:44.870 mostly with HPV that also had

NOTE Confidence: 0.84367865

00:26:44.870 --> 00:26:46.970 taste on demand. I'm sorry.

NOTE Confidence: 0.84367865

 $00:26:46.970 \rightarrow 00:26:49.490$  Taste monthly or every two months,

NOTE Confidence: 0.84367865

 $00:26:49.490 \rightarrow 00:26:52.418$  so they had a scheduled time where they

NOTE Confidence: 0.84367865

 $00:26:52.418 \longrightarrow 00:26:56.738$  had it and as you can see there is a

- NOTE Confidence: 0.84367865
- 00:26:56.738 --> 00:26:58.265 statistically significant difference

 $00{:}26{:}58.265 \dashrightarrow 00{:}27{:}01.115$  in taste versus supportive care.

NOTE Confidence: 0.84367865

 $00:27:01.120 \longrightarrow 00:27:03.050$  So how does this work?

NOTE Confidence: 0.84367865

 $00:27:03.050 \rightarrow 00:27:04.304$  Well, basically aside,

NOTE Confidence: 0.84367865

00:27:04.304 --> 00:27:07.995 all Orlopp Idol is a poppy seed oil and

NOTE Confidence: 0.84367865

 $00{:}27{:}07{.}995 \dashrightarrow 00{:}27{:}11{.}181$  it acts as a drug carrier that seeks out

NOTE Confidence: 0.84367865

 $00{:}27{:}11.181 \dashrightarrow 00{:}27{:}14.592$  the tumors and also acts as an embolic agent.

NOTE Confidence: 0.84367865

 $00{:}27{:}14.600 \dashrightarrow 00{:}27{:}17.240$  And we know that we can do this with the

NOTE Confidence: 0.84367865

 $00{:}27{:}17.306 \dashrightarrow 00{:}27{:}19.681$  understanding that there's very complex

NOTE Confidence: 0.84367865

 $00{:}27{:}19.681 \dashrightarrow 00{:}27{:}22.526$  sinusoidal anatomy and such that the

NOTE Confidence: 0.84367865

 $00{:}27{:}22.526$  -->  $00{:}27{:}25.340$  hepatic artery and the portal vein are

NOTE Confidence: 0.84367865

 $00{:}27{:}25{.}340 \dashrightarrow 00{:}27{:}27{.}806$  actually connected in this time besides.

NOTE Confidence: 0.84367865

 $00{:}27{:}27{.}806$  -->  $00{:}27{:}30{.}735$  And the reason why that's important is NOTE Confidence: 0.84367865

 $00:27:30.735 \longrightarrow 00:27:33.276$  that you can get in paddock arterial

NOTE Confidence: 0.84367865

 $00{:}27{:}33{.}276$  -->  $00{:}27{:}35{.}508$  and portal venous occlusion such that NOTE Confidence: 0.84367865

 $00{:}27{:}35{.}508 \dashrightarrow 00{:}27{:}38{.}358$  the oil ends up in the tumors crosses

NOTE Confidence: 0.84367865

 $00{:}27{:}38{.}358 \dashrightarrow 00{:}27{:}40{.}836$  from the artery into the portal vein

NOTE Confidence: 0.84367865

 $00{:}27{:}40{.}836$  -->  $00{:}27{:}43{.}293$  and then kind of sits there and then NOTE Confidence: 0.84367865

 $00{:}27{:}43{.}293 \dashrightarrow 00{:}27{:}45{.}879$  you block up with particles because the NOTE Confidence: 0.84367865

 $00{:}27{:}45.879 \dashrightarrow 00{:}27{:}48.351$  forward flow is the arterial pressure

NOTE Confidence: 0.84367865

00:27:48.360 --> 00:27:50.957 is still pushing the oil across into

NOTE Confidence: 0.84367865

 $00{:}27{:}50{.}957 \dashrightarrow 00{:}27{:}53{.}786$  the portal vein so you block it up

NOTE Confidence: 0.84367865

 $00{:}27{:}53.786 \dashrightarrow 00{:}27{:}55.860$  with particles to stop that flow.

NOTE Confidence: 0.84367865

 $00{:}27{:}55{.}860 \dashrightarrow 00{:}27{:}58{.}464$  This is just a case of a.

NOTE Confidence: 0.84367865

 $00{:}27{:}58{.}470 \dashrightarrow 00{:}28{:}00{.}474$ 53 year old man with multifocal

NOTE Confidence: 0.84367865

00:28:00.474 --> 00:28:02.687 HCC with chronic HCV and elevated

NOTE Confidence: 0.84367865

 $00{:}28{:}02.687 \dashrightarrow 00{:}28{:}04.707$  AFP who has multifocal disease.

NOTE Confidence: 0.84367865

 $00{:}28{:}04.710 \dashrightarrow 00{:}28{:}07.419$  This large tumor in segments in savings

NOTE Confidence: 0.84367865

 $00{:}28{:}07{.}419 \dashrightarrow 00{:}28{:}09{.}849$  for taking some eight and four a.

NOTE Confidence: 0.84367865

 $00{:}28{:}09{.}850 \dashrightarrow 00{:}28{:}12{.}778$  Here we see it on the CAT scan.

NOTE Confidence: 0.84367865

 $00:28:12.780 \longrightarrow 00:28:13.950$  Here's the tumor.

 $00:28:13.950 \longrightarrow 00:28:17.066$  The Lipiodol has iodine in it so you

NOTE Confidence: 0.84367865

00:28:17.066 $\operatorname{-->}$ 00:28:19.802 actually can see it on an X Ray and

NOTE Confidence: 0.84367865

 $00:28:19.886 \rightarrow 00:28:23.006$  here you can see after the procedure is

NOTE Confidence: 0.84367865

 $00:28:23.006 \rightarrow 00:28:25.250$  over where the lipiodol is staining.

NOTE Confidence: 0.84367865

 $00:28:25.250 \rightarrow 00:28:28.679$  The reason why I brought up in the beginning.

NOTE Confidence: 0.84367865

 $00{:}28{:}28{.}680 \dashrightarrow 00{:}28{:}31{.}606$  About the fact that it's really important

NOTE Confidence: 0.84367865

 $00:28:31.606 \longrightarrow 00:28:34.302$  to know what that this is lipiodol

NOTE Confidence: 0.84367865

 $00{:}28{:}34{.}302 \dashrightarrow 00{:}28{:}37{.}613$  is that I had a report recently of a

NOTE Confidence: 0.84367865

 $00{:}28{:}37{.}613 \dashrightarrow 00{:}28{:}40{.}378$  patient that I treated with this that

NOTE Confidence: 0.84367865

 $00{:}28{:}40{.}380 \dashrightarrow 00{:}28{:}43{.}548$  kind of called the Lipiodol Council

NOTE Confidence: 0.84367865

 $00:28:43.548 \rightarrow 00:28:45.660$  vacations of uncertain etiology.

NOTE Confidence: 0.84367865

00:28:45.660 --> 00:28:48.033 A whole plethora of why you know

NOTE Confidence: 0.84367865

 $00:28:48.033 \rightarrow 00:28:49.660$  what what's going on here.

NOTE Confidence: 0.84367865

 $00{:}28{:}49{.}660 \dashrightarrow 00{:}28{:}52{.}316$  But when we simply just apply it all,

NOTE Confidence: 0.84367865

 $00:28:52.320 \longrightarrow 00:28:53.548$  so like I said,

 $00{:}28{:}53.548 \dashrightarrow 00{:}28{:}54.776$  there's arterial portal communication

NOTE Confidence: 0.84367865

 $00{:}28{:}54.776 \dashrightarrow 00{:}28{:}56.648$  is very important to understand,

NOTE Confidence: 0.84367865

 $00{:}28{:}56{.}650 \dashrightarrow 00{:}28{:}59{.}266$  and the more you get into the portal

NOTE Confidence: 0.84367865

 $00:28:59.266 \rightarrow 00:29:01.640$  vein that apply at all in motion,

NOTE Confidence: 0.84367865

 $00{:}29{:}01.640 \dashrightarrow 00{:}29{:}03.305$  the better results you actually

NOTE Confidence: 0.84367865

 $00{:}29{:}03.305 \dashrightarrow 00{:}29{:}04.970$  get is born out here.

NOTE Confidence: 0.84367865

 $00{:}29{:}04{.}970 \dashrightarrow 00{:}29{:}07{.}733$  Now we do see in our tumor boards that

NOTE Confidence: 0.84367865

00:29:07.733 --> 00:29:09.966 sometimes patients do have some portal,

NOTE Confidence: 0.84367865

 $00{:}29{:}09{.}970 \dashrightarrow 00{:}29{:}10{.}918$  vein, bland throm bus,

NOTE Confidence: 0.84367865

 $00:29:10.918 \rightarrow 00:29:13.559$  and that may be a reason why their

NOTE Confidence: 0.84367865

 $00{:}29{:}13.559 \dashrightarrow 00{:}29{:}15.725$  outcomes for at least their tumor.

NOTE Confidence: 0.84367865

 $00:29:15.730 \rightarrow 00:29:18.064$  Is really well because you're actually

NOTE Confidence: 0.84367865

 $00{:}29{:}18.064 \dashrightarrow 00{:}29{:}20.460$  doing an arterial importal embolization.

NOTE Confidence: 0.84367865

 $00:29:20.460 \longrightarrow 00:29:22.700$  So I want to show a few cases.

NOTE Confidence: 0.84367865

 $00{:}29{:}22{.}700 \dashrightarrow 00{:}29{:}24{.}272$  This is a patient.

NOTE Confidence: 0.84367865

 $00:29:24.272 \longrightarrow 00:29:26.630$  You see the tumor up here

- NOTE Confidence: 0.81704414
- $00:29:26.727 \longrightarrow 00:29:30.020$  in segment 8. And.
- NOTE Confidence: 0.81704414
- $00{:}29{:}30{.}020 \dashrightarrow 00{:}29{:}32{.}108$  Again, we see the tumor here.
- NOTE Confidence: 0.81704414
- $00:29:32.110 \longrightarrow 00:29:34.084$  You see, the lipidol staining the
- NOTE Confidence: 0.81704414
- $00:29:34.084 \rightarrow 00:29:36.630$  tumor on the single flora scopic image,
- NOTE Confidence: 0.81704414
- $00:29:36.630 \longrightarrow 00:29:38.838$  and you can actually see the
- NOTE Confidence: 0.81704414
- $00:29:38.838 \longrightarrow 00:29:41.018$  portal vein here next to the
- NOTE Confidence: 0.81704414
- $00:29:41.018 \longrightarrow 00:29:42.896$  tumor as well as down here.
- NOTE Confidence: 0.81704414
- $00{:}29{:}42{.}900 \dashrightarrow 00{:}29{:}44{.}923$  So at the end of the at
- NOTE Confidence: 0.81704414
- $00:29:44.923 \longrightarrow 00:29:47.069$  the end of the procedure,
- NOTE Confidence: 0.81704414
- $00:29:47.070 \rightarrow 00:29:50.994$  we can see that there is a complete filling
- NOTE Confidence: 0.81704414
- $00:29:50.994 \longrightarrow 00:29:54.847$  of two of tumor with dilipbhai at all.
- NOTE Confidence: 0.81704414
- $00{:}29{:}54.850 \dashrightarrow 00{:}29{:}57.928$  And then this is the before.
- NOTE Confidence: 0.81704414
- $00{:}29{:}57{.}930 \dashrightarrow 00{:}30{:}00{.}926$  And then this is one month after.
- NOTE Confidence: 0.81704414
- $00:30:00.930 \longrightarrow 00:30:04.026$  We see a basically a whole.
- NOTE Confidence: 0.81704414
- $00:30:04.030 \longrightarrow 00:30:04.932$  And ultimately,
- NOTE Confidence: 0.81704414

 $00:30:04.932 \rightarrow 00:30:07.187$  the patient had complete necrosis,

NOTE Confidence: 0.81704414

 $00:30:07.190 \longrightarrow 00:30:09.440$  an now at nine months.

NOTE Confidence: 0.81704414

 $00:30:09.440 \longrightarrow 00:30:12.640$  Follow-up has no residual disease.

NOTE Confidence: 0.81704414

 $00{:}30{:}12.640 \dashrightarrow 00{:}30{:}14.544$  So one of the things that I

NOTE Confidence: 0.81704414

 $00{:}30{:}14{.}544 \dashrightarrow 00{:}30{:}16{.}107$  think is really important and

NOTE Confidence: 0.81704414

 $00{:}30{:}16.107 \dashrightarrow 00{:}30{:}18.494$  we can discuss this in all the

NOTE Confidence: 0.81704414

 $00:30:18.494 \rightarrow 00:30:20.299$  different types of embolization.

NOTE Confidence: 0.81704414

 $00:30:20.300 \longrightarrow 00:30:22.112$  But because of applied all being

NOTE Confidence: 0.81704414

 $00{:}30{:}22.112 \dashrightarrow 00{:}30{:}24.464$  radio paque we can see I'm using this

NOTE Confidence: 0.81704414

00:30:24.464 --> 00:30:26.630 opportunity to talk about advanced imaging,

NOTE Confidence: 0.81704414

 $00:30:26.630 \longrightarrow 00:30:28.744$  so it's very important to get high

NOTE Confidence: 0.81704414

00:30:28.744 --> 00:30:30.290 quality imaging during procedures,

NOTE Confidence: 0.81704414

 $00:30:30.290 \longrightarrow 00:30:32.456$  which I believe is critical to

NOTE Confidence: 0.81704414

 $00:30:32.456 \rightarrow 00:30:33.900$  optimize tumor targeting and

NOTE Confidence: 0.81704414

 $00{:}30{:}33{.}967 \dashrightarrow 00{:}30{:}36{.}151$  this can be done with the 3D

NOTE Confidence: 0.81704414

 $00:30:36.151 \rightarrow 00:30:37.948$  angiography combing or cone beam CT,

- NOTE Confidence: 0.81704414
- $00{:}30{:}37{.}950 \dashrightarrow 00{:}30{:}40{.}099$  which is some of what I showed

 $00{:}30{:}40.099 \dashrightarrow 00{:}30{:}41.712$  or combining a multidetector

NOTE Confidence: 0.81704414

00:30:41.712 --> 00:30:43.557 CT angiography system.

NOTE Confidence: 0.81704414

 $00{:}30{:}43.560 \dashrightarrow 00{:}30{:}46.199$  In your interventional suite and we know

NOTE Confidence: 0.81704414

 $00:30:46.199 \longrightarrow 00:30:48.499$  that from studies as early as 2007,

NOTE Confidence: 0.81704414

 $00{:}30{:}48{.}500 \dashrightarrow 00{:}30{:}51{.}524$  of which I was involved in one from

NOTE Confidence: 0.81704414

 $00{:}30{:}51{.}524 \dashrightarrow 00{:}30{:}54{.}487$  MD Anderson that you do see a lot

NOTE Confidence: 0.81704414

 $00:30:54.487 \rightarrow 00:30:56.790$  of information that is important.

NOTE Confidence: 0.81704414

 $00{:}30{:}56.790 \dashrightarrow 00{:}30{:}58.278$  Over standard digital subtraction

NOTE Confidence: 0.81704414

 $00:30:58.278 \longrightarrow 00:30:59.766$  angiography and back then,

NOTE Confidence: 0.81704414

 $00:30:59.770 \longrightarrow 00:31:02.754$  when we had very poor cone beam CT,

NOTE Confidence: 0.81704414

 $00:31:02.760 \dashrightarrow 00:31:05.904$  it showed that we were able to impact

NOTE Confidence: 0.81704414

 $00{:}31{:}05{.}904 \dashrightarrow 00{:}31{:}08{.}190$  the procedure in 19% of the cases.

NOTE Confidence: 0.81704414

00:31:08.190 $\operatorname{-->}$ 00:31:10.110 There's also now new software that

NOTE Confidence: 0.81704414

 $00:31:10.110 \rightarrow 00:31:12.459$  helps precisely identify tumor feeders,

 $00:31:12.460 \longrightarrow 00:31:14.692$  so we're not just relying on

NOTE Confidence: 0.81704414

00:31:14.692 --> 00:31:15.808 standard DSA alone.

NOTE Confidence: 0.81704414

00:31:15.810 - 00:31:19.167 And then we also with the pie at all,

NOTE Confidence: 0.81704414

 $00{:}31{:}19{.}170 \dashrightarrow 00{:}31{:}21{.}162$  which isn't the same as with

NOTE Confidence: 0.81704414

 $00:31:21.162 \longrightarrow 00:31:23.270$  the other kinds of the rapies.

NOTE Confidence: 0.81704414

 $00{:}31{:}23{.}270 \dashrightarrow 00{:}31{:}25{.}622$  We can actually use this to immediately

NOTE Confidence: 0.81704414

00:31:25.622 --> 00:31:27.860 look at post procedure imaging.

NOTE Confidence: 0.81704414

 $00:31:27.860 \longrightarrow 00:31:29.981$  To show the benefit of the of

NOTE Confidence: 0.81704414

 $00{:}31{:}29{.}981 \dashrightarrow 00{:}31{:}32{.}126$  the tumor targeting as well as

NOTE Confidence: 0.81704414

 $00:31:32.126 \longrightarrow 00:31:33.686$  having confirmation that you

NOTE Confidence: 0.81704414

 $00{:}31{:}33{.}686$  -->  $00{:}31{:}35{.}290$  effectively treated the tumor.

NOTE Confidence: 0.8223492

 $00{:}31{:}37{.}440 \dashrightarrow 00{:}31{:}40{.}860$  So here you see a tumor in. I said,

NOTE Confidence: 0.8223492

00:31:40.860 --> 00:31:43.900 once you fast here, let me go back.

NOTE Confidence: 0.80394745

00:31:46.940 --> 00:31:51.566 So in this case we have two HCC's in

NOTE Confidence: 0.80394745

00:31:51.566 --> 00:31:55.150 segments for a in segment 7 and what NOTE Confidence: 0.80394745

 $00:31:55.150 \longrightarrow 00:31:59.278$  I want to show is a tumor sitting.

- NOTE Confidence: 0.80394745
- $00{:}31{:}59{.}280 \dashrightarrow 00{:}32{:}00{.}540$  Here. And here OK.
- NOTE Confidence: 0.80394745
- $00{:}32{:}00{.}540 \dashrightarrow 00{:}32{:}03{.}361$  And when you do the angio it's very
- NOTE Confidence: 0.80394745
- $00:32:03.361 \longrightarrow 00:32:05.935$  unclear where these tumor feeders are.
- NOTE Confidence: 0.80394745
- $00{:}32{:}05{.}940 \dashrightarrow 00{:}32{:}07{.}116$  So you have one.
- NOTE Confidence: 0.80394745
- 00:32:07.116 --> 00:32:08.586 It's definitely in the right,
- NOTE Confidence: 0.80394745
- $00:32:08.590 \longrightarrow 00:32:10.070$  but you have one here,
- NOTE Confidence: 0.80394745
- $00:32:10.070 \longrightarrow 00:32:11.540$  which is unclear if it's
- NOTE Confidence: 0.80394745
- $00:32:11.540 \longrightarrow 00:32:12.716$  coming from the left,
- NOTE Confidence: 0.80394745
- 00:32:12.720 --> 00:32:15.220 so you can so you can do a cone beam
- NOTE Confidence: 0.80394745
- $00{:}32{:}15{.}298 \dashrightarrow 00{:}32{:}18{.}026$  CT from the left and see no tumor
- NOTE Confidence: 0.80394745
- $00{:}32{:}18.026 \dashrightarrow 00{:}32{:}20.173$  vascularity and then you do it from
- NOTE Confidence: 0.80394745
- $00{:}32{:}20{.}173 \dashrightarrow 00{:}32{:}22{.}455$  the right and we can see a tumor
- NOTE Confidence: 0.80394745
- $00{:}32{:}22{.}455 \dashrightarrow 00{:}32{:}24{.}225$  there and then the tumor there.
- NOTE Confidence: 0.80394745
- $00:32:24.230 \dashrightarrow 00:32:28.290$  And now we know that we're in the right lobe.
- NOTE Confidence: 0.80394745
- $00:32:28.290 \longrightarrow 00:32:30.456$  So after the procedure is over,
- NOTE Confidence: 0.80394745

 $00:32:30.460 \longrightarrow 00:32:32.672$  we can see on a plane image

NOTE Confidence: 0.80394745

 $00{:}32{:}32{.}672 \dashrightarrow 00{:}32{:}34{.}790$  or a flora scopic image.

NOTE Confidence: 0.80394745

 $00{:}32{:}34{.}790 \dashrightarrow 00{:}32{:}36{.}998$  One tumor treated here one tumor

NOTE Confidence: 0.80394745

 $00:32:36.998 \longrightarrow 00:32:39.478$  treated here an on cone beam CT.

NOTE Confidence: 0.80394745

 $00{:}32{:}39{.}480 \dashrightarrow 00{:}32{:}42{.}490$  You can see tumor here.

NOTE Confidence: 0.80394745

 $00{:}32{:}42{.}490 \dashrightarrow 00{:}32{:}43{.}039$  In tumor here.

NOTE Confidence: 0.80394745

 $00{:}32{:}43.039 \dashrightarrow 00{:}32{:}44.137$  So now we know that it

NOTE Confidence: 0.80394745

00:32:44.137 - 00:32:45.269 was effectively treated.

NOTE Confidence: 0.8568363

 $00{:}32{:}47.780 \dashrightarrow 00{:}32{:}49.976$  So this is a case that I did just

NOTE Confidence: 0.8568363

00:32:49.976 --> 00:32:52.214 last week and I thought it would

NOTE Confidence: 0.8568363

 $00{:}32{:}52{.}214 \dashrightarrow 00{:}32{:}54{.}783$  be interesting to show 74 year old

NOTE Confidence: 0.8568363

 $00:32:54.783 \longrightarrow 00:32:56.403$  patient with alcoholic cirrhosis

NOTE Confidence: 0.8568363

 $00:32:56.403 \rightarrow 00:32:58.784 5.8$  centimeter HCC in segment 7.

NOTE Confidence: 0.8568363

 $00:32:58.784 \rightarrow 00:33:01.500$  This is the CT scan right here.

NOTE Confidence: 0.8568363

 $00{:}33{:}01{.}500 \dashrightarrow 00{:}33{:}04{.}548$  This is a previous treatment area.

NOTE Confidence: 0.8568363

00:33:04.550 - 00:33:06.038 We did the angiogram.

- NOTE Confidence: 0.8568363
- $00:33:06.038 \rightarrow 00:33:08.270$  We see the tumor up here.

 $00:33:10.760 \rightarrow 00:33:12.594$  We then see I'm selective image here.

NOTE Confidence: 0.79313654

 $00:33:12.600 \rightarrow 00:33:14.895$  So when we do the cone beam CT thinking

NOTE Confidence: 0.79313654

00:33:14.895 - 00:33:17.067 that we may have had the whole thing,

NOTE Confidence: 0.79313654

 $00{:}33{:}17.070 \dashrightarrow 00{:}33{:}20.350$  we're missing half the tumor.

NOTE Confidence: 0.79313654

 $00:33:20.350 \longrightarrow 00:33:24.718$  OK, so we treated the patient.

NOTE Confidence: 0.79313654

 $00:33:24.720 \longrightarrow 00:33:26.785$  And we see a basically a Half

NOTE Confidence: 0.79313654

 $00:33:26.785 \rightarrow 00:33:28.790$  Moon where half of it's missing.

NOTE Confidence: 0.79313654

 $00{:}33{:}28.790 \dashrightarrow 00{:}33{:}32.734$  So we even got into the other branch.

NOTE Confidence: 0.79313654

00:33:32.740 --> 00:33:35.340 C. Feeling of the tumor.

NOTE Confidence: 0.79313654

 $00:33:35.340 \longrightarrow 00:33:38.156$  And at the end we can see that

NOTE Confidence: 0.79313654

 $00{:}33{:}38{.}156 \dashrightarrow 00{:}33{:}40{.}357$  the tumor is completely treated

NOTE Confidence: 0.79313654

 $00{:}33{:}40{.}357 \dashrightarrow 00{:}33{:}43{.}626$  and then on final cone beam CT.

NOTE Confidence: 0.79313654

00:33:43.630 --> 00:33:46.384 There is complete embolization with lipiodol

NOTE Confidence: 0.79313654

 $00:33:46.384 \rightarrow 00:33:50.088$  so you can see this is very important.

 $00{:}33{:}50{.}090 \dashrightarrow 00{:}33{:}52{.}421$  And I just wanted to show that we have

NOTE Confidence: 0.79313654

 $00{:}33{:}52{.}421 \dashrightarrow 00{:}33{:}54{.}692$  also imaging software that we can use

NOTE Confidence: 0.79313654

 $00{:}33{:}54.692 \dashrightarrow 00{:}33{:}56.779$  to track these tumors very nicely.

NOTE Confidence: 0.79313654

00:33:56.780 --> 00:33:58.908 I don't want to get all details,

NOTE Confidence: 0.79313654

 $00{:}33{:}58{.}910 \dashrightarrow 00{:}34{:}00{.}846$  but you can see that we have a

NOTE Confidence: 0.79313654

 $00{:}34{:}00{.}846 \dashrightarrow 00{:}34{:}02{.}635$  road map simply goes straight to

NOTE Confidence: 0.79313654

 $00{:}34{:}02{.}635 \dashrightarrow 00{:}34{:}04{.}926$  the tumor and that I think results

NOTE Confidence: 0.79313654

 $00:34:04.926 \dashrightarrow 00:34:07.104$  in a much more effective the rapy.

NOTE Confidence: 0.79313654

 $00{:}34{:}07{.}110 \dashrightarrow 00{:}34{:}11{.}169$  And we published on this back in a 2019.

NOTE Confidence: 0.79313654

 $00:34:11.170 \longrightarrow 00:34:14.660$  When we look at treating

NOTE Confidence: 0.79313654

 $00{:}34{:}14.660 \dashrightarrow 00{:}34{:}16.056$  with chemoembolization.

NOTE Confidence: 0.79313654

00:34:16.060 --> 00:34:19.244 We can see that you get much better

NOTE Confidence: 0.79313654

 $00{:}34{:}19{.}244 \dashrightarrow 00{:}34{:}21{.}744$  local tumor progression and overall

NOTE Confidence: 0.79313654

 $00{:}34{:}21.744 \dashrightarrow 00{:}34{:}24.966$  survival when combing CT is used.

NOTE Confidence: 0.79313654

 $00{:}34{:}24.970 \dashrightarrow 00{:}34{:}27.896$  And then we look at adverse events.

NOTE Confidence: 0.79313654

00:34:27.900 - > 00:34:30.252 We always tell patients that this

- NOTE Confidence: 0.79313654
- $00:34:30.252 \rightarrow 00:34:32.490$  is a liver directed therapy.

00:34:32.490 --> 00:34:32.865 However,

NOTE Confidence: 0.79313654

 $00:34:32.865 \rightarrow 00:34:35.490$  their study that came out of Johns

NOTE Confidence: 0.79313654

00:34:35.490 --> 00:34:38.083 Hopkins back in 2008 showed that you

NOTE Confidence: 0.79313654

 $00:34:38.083 \dashrightarrow 00:34:40.528$  can get systemic effects from the

NOTE Confidence: 0.79313654

 $00{:}34{:}40{.}528$  -->  $00{:}34{:}42{.}936$  chemoembolization or conventional tastes,

NOTE Confidence: 0.79313654

 $00{:}34{:}42{.}940 \dashrightarrow 00{:}34{:}46{.}284$  and this is what led to the institution

NOTE Confidence: 0.79313654

 $00:34:46.284 \rightarrow 00:34:49.207$  or development of drug eluting be tastes.

NOTE Confidence: 0.79313654

 $00:34:49.210 \longrightarrow 00:34:50.690$  So the idea here?

NOTE Confidence: 0.79313654

00:34:50.690 - 00:34:52.910 Is that the chemotherapy is then

NOTE Confidence: 0.79313654

 $00{:}34{:}52{.}987 \dashrightarrow 00{:}34{:}55{.}519$  loaded into beads and added to

NOTE Confidence: 0.79313654

00:34:55.519 --> 00:34:58.006 water soluble contrast and can act

NOTE Confidence: 0.79313654

 $00{:}34{:}58.006 \dashrightarrow 00{:}35{:}00{.}540$  as a vector for drug delivery and

NOTE Confidence: 0.79313654

 $00{:}35{:}00{.}540 \dashrightarrow 00{:}35{:}02{.}806$  embolic agent to block arterial

NOTE Confidence: 0.79313654

 $00:35:02.806 \dashrightarrow 00:35:06.310$  blood flow or supply to the tumor?

- $00:35:06.310 \longrightarrow 00:35:08.548$  As we discussed.
- NOTE Confidence: 0.79313654
- 00:35:08.550 --> 00:35:10.385 The actually just you're aware
- NOTE Confidence: 0.79313654
- 00:35:10.385 --> 00:35:12.220 that Luppino has some limitations
- NOTE Confidence: 0.79313654
- $00:35:12.286 \rightarrow 00:35:14.236$  where their attention is variable,
- NOTE Confidence: 0.79313654
- $00:35:14.240 \longrightarrow 00:35:16.620$  and it could wash out quite rapidly
- NOTE Confidence: 0.79313654
- $00:35:16.620 \longrightarrow 00:35:19.159$  if we don't use those particles.
- NOTE Confidence: 0.79313654
- 00:35:19.160 --> 00:35:21.440 And then, like I just showed,
- NOTE Confidence: 0.79313654
- $00:35:21.440 \rightarrow 00:35:23.708$  there could be some systemic toxicity.
- NOTE Confidence: 0.79313654
- $00:35:23.710 \dashrightarrow 00:35:26.405$  So with drug alluding beads you can
- NOTE Confidence: 0.79313654
- 00:35:26.405 --> 00:35:28.718 get predictable retention and this can NOTE Confidence: 0.79313654
- $00:35:28.718 \rightarrow 00:35:30.902$  lead to overall less systemic toxicity,
- NOTE Confidence: 0.79313654
- 00:35:30.910 --> 00:35:34.090 and this is just a case that I did a while
- NOTE Confidence: 0.79313654
- $00:35:34.169 \dashrightarrow 00:35:37.347$  back showing a force .6 centimeter tumor,
- NOTE Confidence: 0.79313654
- $00:35:37.350 \dashrightarrow 00:35:40.059$  which we did with drug eluting beads.
- NOTE Confidence: 0.79313654
- 00:35:40.060 --> 00:35:40.344 However,
- NOTE Confidence: 0.79313654
- $00:35:40.344 \rightarrow 00:35:42.616$  you can't see at the end of the

- NOTE Confidence: 0.79313654
- $00:35:42.616 \rightarrow 00:35:44.498$  procedure that the tumor was treated,
- NOTE Confidence: 0.79313654
- $00{:}35{:}44{.}500 \dashrightarrow 00{:}35{:}46{.}252$  because there is no iodine in
- NOTE Confidence: 0.79313654
- $00{:}35{:}46.252 \dashrightarrow 00{:}35{:}48.061$  these particles and then this is
- NOTE Confidence: 0.79313654
- 00:35:48.061 -> 00:35:49.526 what it looks like afterwards.
- NOTE Confidence: 0.79313654
- $00:35:49.530 \longrightarrow 00:35:51.595$  So this is just a couple of.
- NOTE Confidence: 0.79313654
- $00{:}35{:}51.600 \dashrightarrow 00{:}35{:}54.060$  I have a couple of studies
- NOTE Confidence: 0.79313654
- $00:35:54.060 \longrightarrow 00:35:56.040$  which show the benefit of.
- NOTE Confidence: 0.79313654
- $00:35:56.040 \longrightarrow 00:35:57.320$  Of drug eluting beads.
- NOTE Confidence: 0.79313654
- $00{:}35{:}57{.}320 \dashrightarrow 00{:}36{:}00{.}399$  I don't want to get into all the details,
- NOTE Confidence: 0.79313654
- $00:36:00.400 \longrightarrow 00:36:02.075$  but just show that there
- NOTE Confidence: 0.79313654
- 00:36:02.075 --> 00:36:03.080 are promising results,
- NOTE Confidence: 0.79313654
- $00{:}36{:}03.080 \dashrightarrow 00{:}36{:}05.264$  but in my personal opinion I am much
- NOTE Confidence: 0.79313654
- $00:36:05.264 \rightarrow 00:36:07.327$  more a fan of using conventional
- NOTE Confidence: 0.79313654
- $00{:}36{:}07{.}327 \dashrightarrow 00{:}36{:}09{.}499$  rather than dip tastes and then
- NOTE Confidence: 0.79313654
- $00:36:09.568 \longrightarrow 00:36:11.704$  this is just a recent study
- NOTE Confidence: 0.79313654

 $00:36:11.704 \rightarrow 00:36:13.766$  published in radiology which is a

NOTE Confidence: 0.79313654

00:36:13.766 --> 00:36:15.356 prospective single arm study which

NOTE Confidence: 0.79313654

 $00:36:15.356 \dashrightarrow 00:36:17.544$  also shows the benefit of idarubic in NOTE Confidence: 0.79313654

 $00{:}36{:}17{.}544 \dashrightarrow 00{:}36{:}19{.}878$  alluding beads for the treatment of

NOTE Confidence: 0.79313654

 $00{:}36{:}19.878 \dashrightarrow 00{:}36{:}21.688$  patients with unreflectively CC.

NOTE Confidence: 0.79313654

 $00{:}36{:}21.690 \dashrightarrow 00{:}36{:}23.760$  So there's been a lot of

NOTE Confidence: 0.79313654

00:36:23.760 --> 00:36:25.140 interest in recent years

NOTE Confidence: 0.8352394

 $00{:}36{:}25{.}218$  -->  $00{:}36{:}26{.}769$  in radio embolization.

NOTE Confidence: 0.8352394

 $00{:}36{:}26{.}770 \dashrightarrow 00{:}36{:}29{.}308$  Here we have an implanted radiation

NOTE Confidence: 0.8352394

 $00:36:29.308 \longrightarrow 00:36:31.404$  source that's directly sent to

NOTE Confidence: 0.8352394

 $00:36:31.404 \longrightarrow 00:36:33.414$  the tumors via the attic artery.

NOTE Confidence: 0.8352394

 $00:36:33.420 \longrightarrow 00:36:35.766$  Use Yttrium 90 as the source,

NOTE Confidence: 0.8352394

 $00:36:35.770 \longrightarrow 00:36:38.619$  which is a beta emitter which penetrates

NOTE Confidence: 0.8352394

 $00:36:38.619 \rightarrow 00:36:40.850$  only 2.5 millimeters in the tissue.

NOTE Confidence: 0.8352394

 $00:36:40.850 \longrightarrow 00:36:42.805$  There are glass and resin

NOTE Confidence: 0.8352394

00:36:42.805 --> 00:36:43.587 microspheres available.

- NOTE Confidence: 0.8352394
- $00:36:43.590 \rightarrow 00:36:46.320$  These are thera spheres or Sir spheres,

 $00{:}36{:}46{.}320 \dashrightarrow 00{:}36{:}49{.}434$  but I just wanted to make sure you're all

NOTE Confidence: 0.8352394

 $00:36:49.434 \rightarrow 00:36:52.439$  aware that these are not interchangeable.

NOTE Confidence: 0.8352394

00:36:52.440 --> 00:36:54.824 They're very different products

NOTE Confidence: 0.8352394

 $00:36:54.824 \rightarrow 00:36:57.804$  and they have very different.

NOTE Confidence: 0.8352394

00:36:57.810 --> 00:37:00.120 Characteristics the main idea, I guess,

NOTE Confidence: 0.8352394

 $00{:}37{:}00{.}120 \dashrightarrow 00{:}37{:}02{.}612$  is that the glass beads are have

NOTE Confidence: 0.8352394

 $00{:}37{:}02.612 \dashrightarrow 00{:}37{:}05.129$  a much smaller number of spheres,

NOTE Confidence: 0.8352394

 $00:37:05.130 \longrightarrow 00:37:07.818$  so each year themselves is much hotter.

NOTE Confidence: 0.8352394

 $00:37:07.820 \dashrightarrow 00:37:11.670$  So if you want to treat a much larger area,

NOTE Confidence: 0.8352394

00:37:11.670 --> 00:37:13.788 you may need to use something

NOTE Confidence: 0.8352394

 $00{:}37{:}13.788 \dashrightarrow 00{:}37{:}16.110$  which is much more embolic than

NOTE Confidence: 0.8352394

 $00:37:16.110 \longrightarrow 00:37:18.594$  than than these very small ones.

NOTE Confidence: 0.8352394

00:37:18.600 --> 00:37:19.370 But again,

NOTE Confidence: 0.8352394

 $00{:}37{:}19{.}370 \dashrightarrow 00{:}37{:}22{.}065$  these have much less activity per sphere,

 $00:37:22.070 \rightarrow 00:37:25.526$  but here you get a much more minimal embolic,

NOTE Confidence: 0.8352394

 $00:37:25.530 \longrightarrow 00:37:27.590$  which is much more like

NOTE Confidence: 0.8352394

 $00:37:27.590 \longrightarrow 00:37:28.826$  real radiation therapy.

NOTE Confidence: 0.8352394

 $00{:}37{:}28{.}830 \dashrightarrow 00{:}37{:}31{.}955$  Whereas the Sir spheres are

NOTE Confidence: 0.8352394

00:37:31.955 --> 00:37:33.830 more like embolization.

NOTE Confidence: 0.8352394

 $00{:}37{:}33{.}830 \dashrightarrow 00{:}37{:}36{.}071$  So this is just a case of a 92

NOTE Confidence: 0.8352394

 $00{:}37{:}36.071 \dashrightarrow 00{:}37{:}38.348$  year old female with multifocal HCC

NOTE Confidence: 0.8352394

 $00:37:38.348 \rightarrow 00:37:40.950$  who actually had a tumor rupture.

NOTE Confidence: 0.8352394

 $00{:}37{:}40{.}950 \dashrightarrow 00{:}37{:}43{.}782$  Um, here in in segment 8 with the

NOTE Confidence: 0.8352394

 $00:37:43.782 \rightarrow 00:37:45.149$  satellite tumor as well,

NOTE Confidence: 0.8352394

 $00:37:45.150 \longrightarrow 00:37:46.550$  and as we know,

NOTE Confidence: 0.8352394

00:37:46.550 -> 00:37:48.300 when patients have tumor rupture,

NOTE Confidence: 0.8352394

 $00:37:48.300 \dashrightarrow 00:37:50.400$  they have a very dismal prognosis.

NOTE Confidence: 0.8352394

 $00:37:50.400 \longrightarrow 00:37:51.492$  So like I said,

NOTE Confidence: 0.8352394

 $00{:}37{:}51{.}492 \dashrightarrow 00{:}37{:}54{.}399$  this is a 92 year old female an because

NOTE Confidence: 0.8352394

 $00:37:54.399 \dashrightarrow 00:37:57.185$  I did this with with the rasphere for

- NOTE Confidence: 0.8352394
- $00:37:57.266 \rightarrow 00:37:59.849$  example it was a micro embolic Ann.

 $00{:}37{:}59{.}850 \dashrightarrow 00{:}38{:}01{.}950$  I treated her as an outpatient.

NOTE Confidence: 0.8352394

 $00:38:01.950 \longrightarrow 00:38:04.050$  OK, so here is the tumor.

NOTE Confidence: 0.8352394

00:38:04.050 - 00:38:05.800 We do a mapping study,

NOTE Confidence: 0.8352394

 $00:38:05.800 \longrightarrow 00:38:07.550$  so this is the difference.

NOTE Confidence: 0.8352394

00:38:07.550 --> 00:38:09.300 When you do the other

NOTE Confidence: 0.8352394

00:38:09.300 - 00:38:10.350 kinds of chemoembolization,

NOTE Confidence: 0.8352394

 $00:38:10.350 \rightarrow 00:38:13.278$  you basically take the product off the shelf.

NOTE Confidence: 0.8352394

 $00:38:13.280 \longrightarrow 00:38:15.470$  At the time of the procedure,

NOTE Confidence: 0.8352394

00:38:15.470 --> 00:38:15.768 however,

NOTE Confidence: 0.8352394

 $00:38:15.768 \longrightarrow 00:38:16.364$  with 190,

NOTE Confidence: 0.8352394

 $00{:}38{:}16{.}364 \dashrightarrow 00{:}38{:}18{.}925$  you really have to map out the patients

NOTE Confidence: 0.8352394

 $00:38:18.925 \rightarrow 00:38:21.816$  to make sure that you're not getting

NOTE Confidence: 0.8352394

 $00:38:21.816 \rightarrow 00:38:23.453$  nontarget embolization to other

NOTE Confidence: 0.8352394

 $00:38:23.453 \dashrightarrow 00:38:25.685$  areas which include extra product sites,

 $00:38:25.690 \longrightarrow 00:38:27.880$  and you also have to calculate

NOTE Confidence: 0.8352394

 $00{:}38{:}27{.}880 \dashrightarrow 00{:}38{:}29{.}340$  a lunch on fraction,

NOTE Confidence: 0.8352394

 $00{:}38{:}29{.}340 \dashrightarrow 00{:}38{:}31{.}965$  which is how much of the material

NOTE Confidence: 0.8352394

 $00:38:31.965 \dashrightarrow 00:38:35.150$  gets to the lungs because there exist

NOTE Confidence: 0.8352394

00:38:35.150 --> 00:38:38.102 you heard earlier there are very.

NOTE Confidence: 0.8352394

00:38:38.110 --> 00:38:40.168 Small communication between artery and veins,

NOTE Confidence: 0.8352394

 $00:38:40.170 \rightarrow 00:38:43.257$  and therefore if you give too high a dose,

NOTE Confidence: 0.8352394

 $00:38:43.260 \rightarrow 00:38:45.306$  you can actually get pulmonary fibrosis.

NOTE Confidence: 0.8352394

 $00{:}38{:}45{.}310 \dashrightarrow 00{:}38{:}47{.}396$  So in this patient we were able

NOTE Confidence: 0.8352394

 $00{:}38{:}47{.}396 \dashrightarrow 00{:}38{:}49{.}502$  to see that the radiation went

NOTE Confidence: 0.8352394

 $00{:}38{:}49{.}502 \dashrightarrow 00{:}38{:}52{.}169$  exactly to where we wanted to tumor.

NOTE Confidence: 0.8352394

 $00:38:52.170 \longrightarrow 00:38:54.914$  Here we see the patient for years later,

NOTE Confidence: 0.8352394

 $00:38:54.920 \longrightarrow 00:38:57.146$  so this patient lived to 98 years

NOTE Confidence: 0.8352394

 $00{:}38{:}57{.}146 \dashrightarrow 00{:}38{:}59{.}620$  old and this again is the fact that

NOTE Confidence: 0.8352394

 $00{:}38{:}59{.}620 \dashrightarrow 00{:}39{:}02{.}041$  I treated a 92 year old patient

NOTE Confidence: 0.8352394

00:39:02.041 -> 00:39:03.837 with an outpatient therapy.

- NOTE Confidence: 0.8352394
- $00:39:03.840 \longrightarrow 00:39:06.906$  I kind of thought was pretty amazed.

 $00{:}39{:}06{.}910 \dashrightarrow 00{:}39{:}09{.}304$  These are the toxicities that can

NOTE Confidence: 0.8352394

 $00:39:09.304 \rightarrow 00:39:12.327$  occur by doing very good cone beam CT.

NOTE Confidence: 0.8352394

 $00:39:12.330 \longrightarrow 00:39:13.678$  This actually highlights the

NOTE Confidence: 0.8352394

 $00{:}39{:}13.678 \dashrightarrow 00{:}39{:}16.193$  reason for it that we can reduce

NOTE Confidence: 0.8352394

 $00:39:16.193 \longrightarrow 00:39:18.773$  the toxicities by doing all these

NOTE Confidence: 0.8352394

 $00:39{:}18.773 \dashrightarrow 00{:}39{:}20.063$  advanced imaging techniques.

NOTE Confidence: 0.8352394

 $00{:}39{:}20.070 \dashrightarrow 00{:}39{:}22.000$  This was just the case.

NOTE Confidence: 0.8352394

 $00{:}39{:}22.000 \dashrightarrow 00{:}39{:}24.984$  I want to show it with the utilization

NOTE Confidence: 0.8352394

00:39:24.984 --> 00:39:27.712 of cone beam CT where on cone beam

NOTE Confidence: 0.8352394

 $00{:}39{:}27.712 \dashrightarrow 00{:}39{:}30.879$  CT we see in this patient a retro

NOTE Confidence: 0.8352394

 $00{:}39{:}30{.}879 \dashrightarrow 00{:}39{:}33{.}603$  portal artery that on mapping study

NOTE Confidence: 0.8352394

00:39:33.610 -> 00:39:37.355 we can see some technetium 99 M.

NOTE Confidence: 0.8365445

 $00:39:37.360 \dashrightarrow 00:39:39.496$  Maa actually getting into the duodenum.

NOTE Confidence: 0.8365445

 $00:39:39.500 \longrightarrow 00:39:42.028$  So if you were not care if you

 $00:39:42.028 \rightarrow 00:39:44.498$  were if you were not careful,

NOTE Confidence: 0.8365445

 $00:39:44.500 \rightarrow 00:39:46.774$  you would actually send radioactivity down

NOTE Confidence: 0.8365445

 $00{:}39{:}46.774 \dashrightarrow 00{:}39{:}49.499$  there and that would result in an ulcer.

NOTE Confidence: 0.8365445

 $00:39:49.500 \dashrightarrow 00:39:52.908$  So what I want to also highlight here.

NOTE Confidence: 0.8365445

 $00{:}39{:}52{.}910 \dashrightarrow 00{:}39{:}55{.}997$  Is that? Now a recent article came

NOTE Confidence: 0.8365445

 $00:39:55.997 \rightarrow 00:39:58.770$  out talking about recommendations.

NOTE Confidence: 0.8365445

 $00{:}39{:}58{.}770 \dashrightarrow 00{:}40{:}00{.}252$  A standardized recommend.

NOTE Confidence: 0.8365445

00:40:00.252 --> 00:40:02.728 Nations 4Y-90, in this case,

NOTE Confidence: 0.8365445

 $00{:}40{:}02.728 \dashrightarrow 00{:}40{:}05.704$  resin microspheres and what they say

NOTE Confidence: 0.8365445

 $00:40:05.704 \rightarrow 00:40:09.387$  is that if you do not use cone beam,

NOTE Confidence: 0.8365445

 $00{:}40{:}09{.}390 \dashrightarrow 00{:}40{:}12{.}288$  CT or advanced imaging techniques that NOTE Confidence: 0.8365445

 $00:40:12.288 \rightarrow 00:40:15.248$  that companies or vendors that are

NOTE Confidence: 0.8365445

 $00:40:15.248 \rightarrow 00:40:17.623$  supporting clinical trials won't actually

NOTE Confidence: 0.8365445

 $00{:}40{:}17.623 \dashrightarrow 00{:}40{:}21.165$  want them as part of one of their sites.

NOTE Confidence: 0.8365445

 $00{:}40{:}21.170 \dashrightarrow 00{:}40{:}24.682$  OK, this just shows some data from Europe

NOTE Confidence: 0.8365445

 $00:40:24.682 \rightarrow 00:40:27.848$  on those patients that are all within

- NOTE Confidence: 0.8365445
- $00:40:27.848 \longrightarrow 00:40:31.189$  all across all the PC else stages.
- NOTE Confidence: 0.8365445
- $00{:}40{:}31{.}190 \dashrightarrow 00{:}40{:}33{.}190$  I'm in this particular study.
- NOTE Confidence: 0.8365445
- $00:40:33.190 \longrightarrow 00:40:36.040$  You can see the median overall
- NOTE Confidence: 0.8365445
- 00:40:36.040 --> 00:40:38.610 Survival's in a PCL CAB&C.
- NOTE Confidence: 0.8365445
- 00:40:38.610 --> 00:40:40.182 Residents, although common,
- NOTE Confidence: 0.8365445
- $00:40:40.182 \rightarrow 00:40:43.678$  are fatigue, nausea, vomiting and fever.
- NOTE Confidence: 0.8365445
- $00{:}40{:}43.678$  -->  $00{:}40{:}48.043$  There's the GI ulcers are very uncommon
- NOTE Confidence: 0.8365445
- $00:40:48.043 \rightarrow 00:40:52.110$  and as well as grade three biliary.
- NOTE Confidence: 0.8365445
- $00{:}40{:}52.110 \dashrightarrow 00{:}40{:}53.590$  Issues.
- NOTE Confidence: 0.8365445
- $00:40:53.590 \longrightarrow 00:40:56.649$  And you know one of the most
- NOTE Confidence: 0.8365445
- $00{:}40{:}56{.}649 \dashrightarrow 00{:}40{:}58{.}540$  prolific users of Y-90.
- NOTE Confidence: 0.8365445
- 00:40:58.540 --> 00:41:00.790 This is North data from
- NOTE Confidence: 0.8365445
- 00:41:00.790 --> 00:41:01.690 Northwestern University,
- NOTE Confidence: 0.8365445
- 00:41:01.690 --> 00:41:04.384 where they looked at their first
- NOTE Confidence: 0.8365445
- $00{:}41{:}04{.}384 \dashrightarrow 00{:}41{:}07{.}540$  1000 patients over a 15 year period,
- NOTE Confidence: 0.8365445

- $00:41:07.540 \longrightarrow 00:41:10.240$  and you can see all the
- NOTE Confidence: 0.8365445
- 00:41:10.240 --> 00:41:11.590 classification systems, child,
- NOTE Confidence: 0.8365445
- 00:41:11.590 --> 00:41:12.490 child, Pugh,
- NOTE Confidence: 0.8365445
- $00:41:12.490 \longrightarrow 00:41:14.740$  AB&C where you see BCLCAB&C,
- NOTE Confidence: 0.8365445
- $00:41:14.740 \longrightarrow 00:41:16.945$  and they've even treated patients
- NOTE Confidence: 0.8365445
- $00{:}41{:}16{.}945 \dashrightarrow 00{:}41{:}20{.}140$  with PC LCD and then with those NOTE Confidence: 0.8365445
- $00:41:20.140 \longrightarrow 00:41:22.840$  patients that had child Pugh A&B.
- NOTE Confidence: 0.8365445
- $00{:}41{:}22.840 \dashrightarrow 00{:}41{:}26.428$  These are the overall survival rates.
- NOTE Confidence: 0.8365445
- $00{:}41{:}26{.}430 \dashrightarrow 00{:}41{:}28{.}824$  And you can see they have
- NOTE Confidence: 0.8365445
- $00:41:28.824 \rightarrow 00:41:30.420$  very low adverse events.
- NOTE Confidence: 0.8365445
- $00:41:30.420 \longrightarrow 00:41:32.365$  So based on their experience
- NOTE Confidence: 0.8365445
- 00:41:32.365 --> 00:41:34.810 with 1000 patients over 15 years,
- NOTE Confidence: 0.8365445
- $00:41:34.810 \longrightarrow 00:41:36.895$  they use radio embolization as
- NOTE Confidence: 0.8365445
- 00:41:36.895 --> 00:41:38.563 their primary treatment option
- NOTE Confidence: 0.8365445
- $00:41:38.563 \longrightarrow 00:41:40.399$  and then this just shows.
- NOTE Confidence: 0.8365445
- $00:41:40.400 \rightarrow 00:41:42.764$  And this is something that I

- NOTE Confidence: 0.8365445
- $00:41:42.764 \rightarrow 00:41:44.816$  think we basically treat probably

 $00:41:44.816 \longrightarrow 00:41:47.174$  less than I think we should.

NOTE Confidence: 0.8365445

 $00:41:47.180 \longrightarrow 00:41:49.394$  We start tumor board is patients

NOTE Confidence: 0.8365445

 $00:41:49.394 \rightarrow 00:41:51.970$  that have portal vein tumor thrombus.

NOTE Confidence: 0.8365445

 $00:41:51.970 \longrightarrow 00:41:54.448$  This just shows the overall benefit

NOTE Confidence: 0.8365445

 $00:41:54.448 \longrightarrow 00:41:56.889$  of those patients that with Y-90.

NOTE Confidence: 0.8365445

 $00{:}41{:}56.890 \dashrightarrow 00{:}41{:}58.735$  And I also believe conventional

NOTE Confidence: 0.8365445

00:41:58.735 --> 00:42:00.580 tastes do a good job,

NOTE Confidence: 0.8365445

 $00:42:00.580 \longrightarrow 00:42:03.905$  at least getting into the tumor vasculature

NOTE Confidence: 0.8365445

 $00:42:03.905 \longrightarrow 00:42:07.018$  of these portal vein tumor thrombus.

NOTE Confidence: 0.8365445

 $00{:}42{:}07{.}020 \dashrightarrow 00{:}42{:}08{.}732$  They're having some advanced

NOTE Confidence: 0.8365445

 $00{:}42{:}08.732 \dashrightarrow 00{:}42{:}10.444$  radio with embolization concepts.

NOTE Confidence: 0.8365445

 $00{:}42{:}10{.}450 \dashrightarrow 00{:}42{:}12{.}170$  When we first started

NOTE Confidence: 0.8365445

00:42:12.170 --> 00:42:13.460 doing radio embolization,

NOTE Confidence: 0.8365445

 $00{:}42{:}13.460 \dashrightarrow 00{:}42{:}15.600$  patients got whole liver infusions.

- $00:42:15.600 \rightarrow 00:42:16.017$  However,
- NOTE Confidence: 0.8365445
- 00:42:16.017 --> 00:42:17.685 overtime with patients getting
- NOTE Confidence: 0.8365445
- 00:42:17.685 --> 00:42:19.770 going into liver failure and
- NOTE Confidence: 0.8365445
- 00:42:19.832 --> 00:42:21.608 having really severe fatigue,
- NOTE Confidence: 0.8365445
- $00{:}42{:}21.610 \dashrightarrow 00{:}42{:}24.606$  it's turned into a originally low bar.
- NOTE Confidence: 0.8365445
- $00:42:24.610 \longrightarrow 00:42:25.394$  Infusions OK,
- NOTE Confidence: 0.8365445
- $00:42:25.394 \longrightarrow 00:42:27.746$  which you so from here to
- NOTE Confidence: 0.8365445
- $00:42:27.746 \longrightarrow 00:42:29.760$  here and then overtime.
- NOTE Confidence: 0.8365445
- $00{:}42{:}29{.}760 \dashrightarrow 00{:}42{:}33{.}008$  The idea was that we can may be get
- NOTE Confidence: 0.8365445
- $00:42:33.008 \rightarrow 00:42:35.272$  segmental infusions and then ultimately
- NOTE Confidence: 0.8365445
- $00:42:35.272 \rightarrow 00:42:38.026$  get the infusion directly into the.
- NOTE Confidence: 0.8365445
- $00:42:38.030 \rightarrow 00:42:39.458$  Into the tumor,
- NOTE Confidence: 0.8365445
- $00:42:39.458 \longrightarrow 00:42:42.314$  provided that there is a single
- NOTE Confidence: 0.8365445
- $00:42:42.314 \longrightarrow 00:42:45.467$  or maybe two feeding arteries.
- NOTE Confidence: 0.8365445
- $00:42:45.470 \longrightarrow 00:42:48.270$  So here we talk about radio radiation,
- NOTE Confidence: 0.8365445
- 00:42:48.270 --> 00:42:48.888 lobectomy OK,

- NOTE Confidence: 0.8365445
- $00:42:48.888 \longrightarrow 00:42:51.360$  and this is a way that we can

 $00{:}42{:}51{.}433 \dashrightarrow 00{:}42{:}53{.}445$  hypertrophied the liver prior

NOTE Confidence: 0.8365445

 $00:42:53.445 \rightarrow 00:42:55.960$  to resection while still keeping

NOTE Confidence: 0.8365445

 $00:42:55.960 \longrightarrow 00:42:57.469$  control of the tumor.

NOTE Confidence: 0.8365445

 $00{:}42{:}57{.}470 \dashrightarrow 00{:}42{:}59{.}950$  So the idea here is that we can

NOTE Confidence: 0.8365445

 $00:42:59.950 \longrightarrow 00:43:01.713$  generate future liver remnant

NOTE Confidence: 0.8365445

 $00:43:01.713 \rightarrow 00:43:03.865$  hypertrophie that permit resection,

NOTE Confidence: 0.8365445

 $00:43:03.870 \longrightarrow 00:43:06.670$  allowing for a biological test of time.

NOTE Confidence: 0.8365445

 $00{:}43{:}06{.}670 \dashrightarrow 00{:}43{:}09{.}470$  And as you may have seen from

NOTE Confidence: 0.8365445

 $00:43:09.470 \longrightarrow 00:43:10.670$  the previous patient,

NOTE Confidence: 0.8365445

00:43:10.670 --> 00:43:13.112 the previous slide we can permit

NOTE Confidence: 0.8365445

00:43:13.112 --> 00:43:15.212 patients with portal vein tumor

NOTE Confidence: 0.8365445

 $00:43:15.212 \rightarrow 00:43:17.977$  thrombus to maybe be converted to even.

NOTE Confidence: 0.8337787

 $00:43:17.980 \longrightarrow 00:43:19.688$  Being resectable the pathophysiology

NOTE Confidence: 0.8337787

 $00{:}43{:}19.688 \dashrightarrow 00{:}43{:}22.715$  of this is that you are getting

00:43:22.715 --> 00:43:25.025 some scarring and fibrosis of the

NOTE Confidence: 0.8337787

 $00{:}43{:}25.025 \dashrightarrow 00{:}43{:}27.819$  liver in the side that was treated,

NOTE Confidence: 0.8337787

 $00{:}43{:}27.820$  -->  $00{:}43{:}30.208$  and therefore you're getting compared to NOTE Confidence: 0.8337787

 $00{:}43{:}30{.}208 \dashrightarrow 00{:}43{:}32{.}740$  Tori hypertrophy of the untreated low.

NOTE Confidence: 0.8337787

 $00{:}43{:}32{.}740 \dashrightarrow 00{:}43{:}35{.}560$  That being said, the treatment changes

NOTE Confidence: 0.8337787

 $00{:}43{:}35{.}560 \dashrightarrow 00{:}43{:}38{.}269$  are comparable to portal vein EMBO.

NOTE Confidence: 0.8337787

 $00{:}43{:}38{.}270 \dashrightarrow 00{:}43{:}41{.}158$  I'll be at it. Invite at a slightly lower,

NOTE Confidence: 0.8337787

 $00:43:41.160 \longrightarrow 00:43:43.170$  slower way, but it does have

NOTE Confidence: 0.8337787

 $00{:}43{:}43.170 \dashrightarrow 00{:}43{:}45.130$  the benefit of tumor control,

NOTE Confidence: 0.8337787

 $00{:}43{:}45{.}130 \dashrightarrow 00{:}43{:}46{.}358$  which portal embolization doesn't,

NOTE Confidence: 0.8337787

 $00{:}43{:}46{.}358 \dashrightarrow 00{:}43{:}48{.}200$  and then we can talk about

NOTE Confidence: 0.8337787

 $00:43:48.252 \longrightarrow 00:43:49.460$  radiation segmentectomy,

NOTE Confidence: 0.8337787

 $00{:}43{:}49{.}460 \dashrightarrow 00{:}43{:}51{.}326$  which is directly getting which is

NOTE Confidence: 0.8337787

 $00:43:51.326 \rightarrow 00:43:53.789$  supposed to be a curative treatment,

NOTE Confidence: 0.8337787

00:43:53.790 --> 00:43:54.858 similar to ablation,

NOTE Confidence: 0.8337787

 $00:43:54.858 \longrightarrow 00:43:57.350$  where you treat up to two panic

- NOTE Confidence: 0.8337787
- $00:43:57.426 \longrightarrow 00:43:59.206$  segments with a low bardo.

 $00{:}43{:}59{.}210 \dashrightarrow 00{:}44{:}01{.}418$  So you're basically taking this large

NOTE Confidence: 0.8337787

 $00:44:01.418 \longrightarrow 00:44:04.259$  dose that you do for the whole lobe,

NOTE Confidence: 0.8337787

 $00:44:04.260 \rightarrow 00:44:07.908$  and putting it into one or two segments.

NOTE Confidence: 0.8337787

00:44:07.910 --> 00:44:10.680 OK, you get much higher.

NOTE Confidence: 0.8509198

 $00{:}44{:}13.140 \dashrightarrow 00{:}44{:}15.135$  Active activity to each of those areas

NOTE Confidence: 0.8509198

 $00{:}44{:}15{.}135 \dashrightarrow 00{:}44{:}17{.}568$  and in some cases it's been adopted

NOTE Confidence: 0.8509198

 $00:44:17.568 \rightarrow 00:44:19.468$  as first line transarterial therapy.

NOTE Confidence: 0.8509198

 $00:44:19.470 \longrightarrow 00:44:22.158$  So the idea here that is that it

NOTE Confidence: 0.8509198

00:44:22.158 --> 00:44:24.129 really needs to. In my opinion,

NOTE Confidence: 0.8509198

 $00:44:24.129 \longrightarrow 00:44:26.460$  it really needs to be more validated,

NOTE Confidence: 0.8509198

00:44:26.460 --> 00:44:29.421 but you can see from this case that you're

NOTE Confidence: 0.8509198

 $00{:}44{:}29{.}421 \dashrightarrow 00{:}44{:}32{.}120$  placing the catheter right up to the tumor.

NOTE Confidence: 0.8509198

 $00{:}44{:}32.120 \dashrightarrow 00{:}44{:}34.292$  The tumor here is completely hot

NOTE Confidence: 0.8509198

 $00{:}44{:}34{.}292 \dashrightarrow 00{:}44{:}37{.}022$  and then after six weeks later you
$00:44:37.022 \rightarrow 00:44:39.434$  see complete necrosis of the tumor.

NOTE Confidence: 0.8509198

 $00{:}44{:}39{.}440 \dashrightarrow 00{:}44{:}41{.}967$  So I also wanted to focus on

NOTE Confidence: 0.8509198

00:44:41.967 --> 00:44:43.050 portal vein embolization.

NOTE Confidence: 0.8509198

 $00:44:43.050 \rightarrow 00:44:45.216$  This is a transvenous therapy supportively,

NOTE Confidence: 0.8509198

 $00:44:45.220 \rightarrow 00:44:47.900$  and embolization is is that it's a way

NOTE Confidence: 0.8509198

 $00{:}44{:}47{.}900 \dashrightarrow 00{:}44{:}50{.}285$  of redirecting portal blood flow to the NOTE Confidence: 0.8509198

 $00{:}44{:}50{.}285 \dashrightarrow 00{:}44{:}52{.}807$  future liver remnant and by doing so

NOTE Confidence: 0.8509198

 $00{:}44{:}52.807 \dashrightarrow 00{:}44{:}55.237$  could initiate hypertrophy of the non

NOTE Confidence: 0.8509198

 $00{:}44{:}55{.}237 \dashrightarrow 00{:}44{:}57{.}486$  embolize segments and by doing that NOTE Confidence: 0.8509198

 $00{:}44{:}57{.}486$  -->  $00{:}44{:}58{.}922$  can reduce perioperative complications NOTE Confidence: 0.8509198

 $00:44:58.922 \rightarrow 00:45:01.406$  such that we can increase the number NOTE Confidence: 0.8509198

 $00:45:01.406 \rightarrow 00:45:03.116$  of potential surgical candidates who

NOTE Confidence: 0.8509198

 $00{:}45{:}03.179 \dashrightarrow 00{:}45{:}05.399$  have what we call marginal anticipated

NOTE Confidence: 0.8509198

 $00{:}45{:}05{.}399 \dashrightarrow 00{:}45{:}06{.}879$  future liver remnant volumes.

NOTE Confidence: 0.8509198

 $00{:}45{:}06{.}880 \dashrightarrow 00{:}45{:}09{.}456$  We can also achieve looks like similar.

NOTE Confidence: 0.8509198

 $00:45:09.460 \longrightarrow 00:45:10.312$  Survival rates surgical

- NOTE Confidence: 0.8509198
- $00:45:10.312 \rightarrow 00:45:11.448$  patients not requiring PV.

 $00:45:11.450 \longrightarrow 00:45:12.582$  Now Kevin Billingslea spoke

NOTE Confidence: 0.8509198

 $00:45:12.582 \rightarrow 00:45:13.997$  about this a month ago,

NOTE Confidence: 0.8509198

 $00:45:14.000 \dashrightarrow 00:45:16.840$  so I didn't want to focus too much on it.

NOTE Confidence: 0.8509198

 $00{:}45{:}16{.}840 \dashrightarrow 00{:}45{:}19{.}441$  But this is just a case of a patient

NOTE Confidence: 0.8509198

 $00{:}45{:}19{.}441 \dashrightarrow 00{:}45{:}22{.}268$  with HTC 10 centimeter solitaire E mass.

NOTE Confidence: 0.8509198

 $00:45:22.270 \rightarrow 00:45:24.974$  But you can see here we perform volumetry

NOTE Confidence: 0.8509198

 $00:45:24.974 \rightarrow 00:45:27.000$  in patients that have cirrhosis,

NOTE Confidence: 0.8509198

 $00:45:27.000 \rightarrow 00:45:28.820$  but normal underlying liver function.

NOTE Confidence: 0.8509198

 $00{:}45{:}28.820 \dashrightarrow 00{:}45{:}31.732$  We need about 40% of the remaining liver

NOTE Confidence: 0.8509198

 $00:45:31.732 \longrightarrow 00:45:34.280$  after surgery, so this patient had 33%.

NOTE Confidence: 0.8509198

 $00{:}45{:}34{.}280 \dashrightarrow 00{:}45{:}36{.}848$  I don't want to get into all the

NOTE Confidence: 0.8509198

 $00{:}45{:}36{.}848 \dashrightarrow 00{:}45{:}39{.}379$  like how you measure it exactly.

NOTE Confidence: 0.8509198

00:45:39.380 - 00:45:41.928 It's kind of beyond the scope here,

NOTE Confidence: 0.8509198

 $00:45:41.930 \longrightarrow 00:45:43.745$  but basically this patient did

- $00:45:43.745 \longrightarrow 00:45:45.197$  not have sufficient liver.
- NOTE Confidence: 0.8509198
- 00:45:45.200 --> 00:45:46.660 A sufficient anticipated future
- NOTE Confidence: 0.8509198
- $00:45:46.660 \longrightarrow 00:45:47.390$  liver remnant.
- NOTE Confidence: 0.8509198
- $00{:}45{:}47{.}390 \dashrightarrow 00{:}45{:}49{.}210$  So this patient was considered
- NOTE Confidence: 0.8509198
- $00:45:49.210 \longrightarrow 00:45:51.030$  a candidate for right Pve.
- NOTE Confidence: 0.8509198
- $00:45:51.030 \longrightarrow 00:45:52.598$  We do write PVE,
- NOTE Confidence: 0.8509198
- $00{:}45{:}52{.}598 \dashrightarrow 00{:}45{:}53{.}774$  we do Pve.
- NOTE Confidence: 0.8509198
- $00:45:53.780 \longrightarrow 00:45:55.405$  Cricket Aneus Lee where you
- NOTE Confidence: 0.8509198
- $00{:}45{:}55{.}405 \dashrightarrow 00{:}45{:}57{.}030$  puncture into the right portal
- NOTE Confidence: 0.8509198
- $00{:}45{:}57.095 \dashrightarrow 00{:}45{:}58.779$  vein and ipsilateral approach.
- NOTE Confidence: 0.8509198
- $00{:}45{:}58{.}780 \dashrightarrow 00{:}46{:}01{.}034$  We infuse particles and coils and we
- NOTE Confidence: 0.8509198
- $00{:}46{:}01{.}034 \dashrightarrow 00{:}46{:}03{.}212$  can see that there's complete diversion
- NOTE Confidence: 0.8509198
- $00:46:03.212 \longrightarrow 00:46:06.280$  of flow from the right into the left.
- NOTE Confidence: 0.8509198
- $00:46:06.280 \longrightarrow 00:46:08.422$  We do the volumes and this
- NOTE Confidence: 0.8509198
- $00:46:08.422 \longrightarrow 00:46:09.850$  patient increased their size,
- NOTE Confidence: 0.8509198
- $00:46:09.850 \rightarrow 00:46:12.546$  their liver and 18% so this patient was

- NOTE Confidence: 0.8509198
- $00:46:12.546 \rightarrow 00:46:14.837$  considered a candidate for right hip.
- NOTE Confidence: 0.8509198
- $00:46:14.840 \longrightarrow 00:46:17.339$  Protect me and this is how the
- NOTE Confidence: 0.8509198
- 00:46:17.339 --> 00:46:18.410 liberal looks intra,
- NOTE Confidence: 0.8509198
- $00:46:18.410 \longrightarrow 00:46:19.670$  procedurally or interactions
- NOTE Confidence: 0.8509198
- $00{:}46{:}19.670 \dashrightarrow 00{:}46{:}21.770$  intraoperatively where you see a
- NOTE Confidence: 0.8509198
- $00{:}46{:}21.770 \dashrightarrow 00{:}46{:}23.910$  very atrophic right lobe and a very.
- NOTE Confidence: 0.8509198
- 00:46:23.910 --> 00:46:28.179 Hypertrophic very pinkish.
- NOTE Confidence: 0.8509198
- $00{:}46{:}28.180 \dashrightarrow 00{:}46{:}30.862$  Left lobe so this patient underwent
- NOTE Confidence: 0.8509198
- $00:46:30.862 \rightarrow 00:46:33.230$  a very uneventful hospital course
- NOTE Confidence: 0.8509198
- $00:46:33.230 \longrightarrow 00:46:34.240$  after surgery,
- NOTE Confidence: 0.8509198
- $00{:}46{:}34{.}240 \dashrightarrow 00{:}46{:}37{.}030$  but developed recurrence at five years,
- NOTE Confidence: 0.8509198
- $00{:}46{:}37{.}030 \dashrightarrow 00{:}46{:}39{.}382$  but then underwent
- NOTE Confidence: 0.8509198
- $00{:}46{:}39{.}382 \dashrightarrow 00{:}46{:}40{.}950$  successful transplantation.
- NOTE Confidence: 0.8509198
- $00{:}46{:}40{.}950 \dashrightarrow 00{:}46{:}42{.}539$  A little bit of data on this.
- NOTE Confidence: 0.7872134
- $00{:}46{:}44.610 \dashrightarrow 00{:}46{:}46.570$  This is the only prospective
- NOTE Confidence: 0.7872134

 $00:46:46.570 \rightarrow 00:46:48.951$  clinical trial looking at PVE and

NOTE Confidence: 0.7872134

 $00:46:48.951 \longrightarrow 00:46:51.039$  in the setting of injured liver.

NOTE Confidence: 0.7872134

 $00{:}46{:}51{.}040 \dashrightarrow 00{:}46{:}53{.}866$  It's the only clinical trial that

NOTE Confidence: 0.7872134

 $00{:}46{:}53.866 \dashrightarrow 00{:}46{:}57.059$  will be done because there's those.

NOTE Confidence: 0.7872134

 $00{:}46{:}57.060 \dashrightarrow 00{:}46{:}58.748$  Surgeons and interventional radiologist

NOTE Confidence: 0.7872134

 $00{:}46{:}58.748 \dashrightarrow 00{:}47{:}01.677$  who believe that it's unethical to submit

NOTE Confidence: 0.7872134

00:47:01.677 --> 00:47:03.693 to subjective patient to a procedure

NOTE Confidence: 0.7872134

 $00:47:03.693 \rightarrow 00:47:05.679$  that they think or I should say,

NOTE Confidence: 0.7872134

 $00{:}47{:}05{.}680 \dashrightarrow 00{:}47{:}08{.}352$  not subject to patients to a procedure that

NOTE Confidence: 0.7872134

 $00{:}47{:}08.352 \dashrightarrow 00{:}47{:}10.700$  those surgeons and radiologists think work.

NOTE Confidence: 0.7872134

00:47:10.700 --> 00:47:13.010 And then if a patient dies because

NOTE Confidence: 0.7872134

 $00:47:13.010 \longrightarrow 00:47:15.009$  they went into liver failure,

NOTE Confidence: 0.7872134

 $00{:}47{:}15.010 \dashrightarrow 00{:}47{:}16.810$  that will be a problem.

NOTE Confidence: 0.7872134

 $00:47:16.810 \longrightarrow 00:47:19.834$  So this just shows how using

NOTE Confidence: 0.7872134

00:47:19.834 --> 00:47:21.346 Portal vein embolization.

NOTE Confidence: 0.7872134

 $00:47:21.350 \longrightarrow 00:47:22.610$  Actually improves patients

- NOTE Confidence: 0.7872134
- $00:47:22.610 \longrightarrow 00:47:23.450$  postoperative course.

 $00{:}47{:}23.450 \dashrightarrow 00{:}47{:}26.996$  This was a study that we did at MD

NOTE Confidence: 0.7872134

 $00{:}47{:}26.996 \dashrightarrow 00{:}47{:}29.905$  Anderson where we see that all of

NOTE Confidence: 0.7872134

 $00:47:29.905 \rightarrow 00:47:32.496$  the deaths occur in those patients

NOTE Confidence: 0.7872134

 $00{:}47{:}32{.}496 \dashrightarrow 00{:}47{:}35{.}576$  that did not have Pve and then

NOTE Confidence: 0.7872134

 $00:47:35.576 \longrightarrow 00:47:38.204$  in terms of survival outcomes.

NOTE Confidence: 0.7872134

00:47:38.204 --> 00:47:39.296 We have,

NOTE Confidence: 0.7872134

 $00{:}47{:}39{.}300 \dashrightarrow 00{:}47{:}41{.}743$  you can see that there are pretty

NOTE Confidence: 0.7872134

 $00{:}47{:}41.743 \dashrightarrow 00{:}47{:}43.945$  similar those patients to those patients

NOTE Confidence: 0.7872134

 $00{:}47{:}43{.}945 \dashrightarrow 00{:}47{:}46{.}479$  that have deviated to those that didn't.

NOTE Confidence: 0.7872134

 $00{:}47{:}46{.}480 \dashrightarrow 00{:}47{:}48{.}490$  Now what we need to understand

NOTE Confidence: 0.7872134

 $00{:}47{:}48{.}490 \dashrightarrow 00{:}47{:}50{.}548$  is that those patients that did

NOTE Confidence: 0.7872134

 $00:47:50.548 \longrightarrow 00:47:52.486$  not I should say that received

NOTE Confidence: 0.7872134

 $00{:}47{:}52{.}486 \dashrightarrow 00{:}47{:}54{.}020$  portal vein embolization.

NOTE Confidence: 0.7872134

 $00{:}47{:}54.020 \dashrightarrow 00{:}47{:}55.452$  Those patients typically would

 $00{:}47{:}55{.}452 \dashrightarrow 00{:}47{:}58{.}015$  not have been a certain would not

NOTE Confidence: 0.7872134

00:47:58.015 --> 00:47:59.755 have been a surgical candidate,

NOTE Confidence: 0.7872134

 $00{:}47{:}59.760 \dashrightarrow 00{:}48{:}01.192$  would have probably undergone

NOTE Confidence: 0.7872134

 $00:48:01.192 \longrightarrow 00:48:02.266$  a transarterial therapy,

NOTE Confidence: 0.7872134

 $00{:}48{:}02{.}270 \dashrightarrow 00{:}48{:}04{.}784$  and the numbers show that those

NOTE Confidence: 0.7872134

 $00{:}48{:}04{.}784$  -->  $00{:}48{:}06{.}916$  patients would probably have a 20 NOTE Confidence: 0.7872134

 $00:48:06.916 \longrightarrow 00:48:08.572$  to 30% three year overall survival.

NOTE Confidence: 0.7872134

 $00:48:08.572 \longrightarrow 00:48:10.890$  So just by doing the Pve and

NOTE Confidence: 0.7872134

 $00:48:10.890 \longrightarrow 00:48:12.640$  getting the patient to surgery,

NOTE Confidence: 0.7872134

 $00{:}48{:}12.640 \dashrightarrow 00{:}48{:}14.789$  the patient had a much better outcome.

NOTE Confidence: 0.7872134

 $00:48:14.790 \longrightarrow 00:48:16.533$  So when we look at the staging

NOTE Confidence: 0.7872134

00:48:16.533 --> 00:48:18.670 system which I discussed in the very

NOTE Confidence: 0.7872134

 $00{:}48{:}18.670 \dashrightarrow 00{:}48{:}20.330$  beginning and by understanding all

NOTE Confidence: 0.7872134

 $00{:}48{:}20{.}330 \dashrightarrow 00{:}48{:}22{.}362$  the different procedures that we can

NOTE Confidence: 0.7872134

 $00:48:22.362 \longrightarrow 00:48:24.302$  offer at all the different stages,

NOTE Confidence: 0.7872134

 $00:48:24.302 \longrightarrow 00:48:26.114$  we now see that those patients

- NOTE Confidence: 0.7872134
- $00:48:26.114 \rightarrow 00:48:27.997$  that have very early or early

 $00{:}48{:}27{.}997 \dashrightarrow 00{:}48{:}29{.}527$  stage disease can result in.

NOTE Confidence: 0.8070893

 $00:48:33.280 \longrightarrow 00:48:35.660$  Major stage be can have a greater

NOTE Confidence: 0.8070893

 $00:48:35.660 \longrightarrow 00:48:38.500$  than 2.5 year survival and then those.

NOTE Confidence: 0.8070893

 $00{:}48{:}38{.}500 \dashrightarrow 00{:}48{:}41{.}349$  Of course that have advanced in terminal

NOTE Confidence: 0.8070893

 $00:48:41.349 \rightarrow 00:48:43.350$  stages obviously don't do as well,

NOTE Confidence: 0.8070893

 $00:48:43.350 \longrightarrow 00:48:45.588$  but this just shows a recent.

NOTE Confidence: 0.8070893

 $00:48:45.590 \rightarrow 00:48:48.574$  This is from a recent Journal of Hepatology

NOTE Confidence: 0.8070893

 $00{:}48{:}48{.}574 \dashrightarrow 00{:}48{:}50{.}479$  Clinical Practice guidelines from Easel

NOTE Confidence: 0.8070893

 $00:48:50.479 \longrightarrow 00:48:53.041$  that there is really the newest thing.

NOTE Confidence: 0.8070893

00:48:53.050 --> 00:48:55.738 So I just wanted to pretty much finish

NOTE Confidence: 0.8070893

 $00{:}48{:}55{.}738 \dashrightarrow 00{:}48{:}59{.}020$  up by some things that we're doing now.

NOTE Confidence: 0.8070893

00:48:59.020 --> 00:49:01.964 Some new the rapeutic approaches and I want to

NOTE Confidence: 0.8070893

 $00{:}49{:}01{.}964 \dashrightarrow 00{:}49{:}03{.}969$  discuss immunotherapy and interventional on.

NOTE Confidence: 0.8070893

 $00:49:03.970 \longrightarrow 00:49:06.718$  And how it interacts with interventional

 $00:49:06.718 \longrightarrow 00:49:09.660$  oncology so we all know that

NOTE Confidence: 0.8070893

 $00{:}49{:}09{.}660 \dashrightarrow 00{:}49{:}11{.}712$  immuno<br/>therapy plays an important

NOTE Confidence: 0.8070893

 $00{:}49{:}11.712 \dashrightarrow 00{:}49{:}14.620$  role in malignant tumor treatment.

NOTE Confidence: 0.8070893

 $00:49:14.620 \longrightarrow 00:49:15.792$  In particular.

NOTE Confidence: 0.8070893

 $00{:}49{:}15.792 \dashrightarrow 00{:}49{:}18.136$  Immune checkpoint inhibitors have

NOTE Confidence: 0.8070893

00:49:18.136 --> 00:49:21.008 promising clinical applications and we

NOTE Confidence: 0.8070893

 $00{:}49{:}21.008 \dashrightarrow 00{:}49{:}23.273$  also understand that monother apy only

NOTE Confidence: 0.8070893

 $00:49:23.273 \longrightarrow 00:49:26.279$  benefits a small portion of the patients.

NOTE Confidence: 0.8070893

 $00{:}49{:}26.280 \dashrightarrow 00{:}49{:}28.400$  So for that reason,

NOTE Confidence: 0.8070893

00:49:28.400 --> 00:49:30.520 combination of different immune

NOTE Confidence: 0.8070893

 $00:49:30.520 \longrightarrow 00:49:32.165$  checkpoint inhibitors with

NOTE Confidence: 0.8070893

 $00{:}49{:}32.165 \dashrightarrow 00{:}49{:}34.197$  different mechanism of action.

NOTE Confidence: 0.8070893

 $00{:}49{:}34{.}200 \dashrightarrow 00{:}49{:}35{.}817$  Have been utilized.

NOTE Confidence: 0.8070893

00:49:35.817 --> 00:49:36.356 However,

NOTE Confidence: 0.8070893

 $00{:}49{:}36{.}356 \dashrightarrow 00{:}49{:}39{.}051$  despite this there's been a

NOTE Confidence: 0.8070893

 $00{:}49{:}39{.}051 \dashrightarrow 00{:}49{:}42{.}298$  increase in the incidence of immune

- NOTE Confidence: 0.8070893
- 00:49:42.298 --> 00:49:44.398 related severe adverse events,

 $00:49:44.400 \longrightarrow 00:49:48.264$  so in some cases a lot of patients

NOTE Confidence: 0.8070893

 $00:49:48.264 \rightarrow 00:49:52.456$  may not be really amenable to this.

NOTE Confidence: 0.8070893

 $00:49:52.460 \rightarrow 00:49:56.276$  We know that our interventional oncology

NOTE Confidence: 0.8070893

00:49:56.276 --> 00:50:00.389 therapies do elicit systemic immune response.

NOTE Confidence: 0.8070893

00:50:00.390 --> 00:50:00.709 However,

NOTE Confidence: 0.8070893

 $00:50:00.709 \rightarrow 00:50:03.261$  these responses may be too weak to prevent

NOTE Confidence: 0.8070893

 $00:50:03.261 \rightarrow 00:50:05.489$  local recurrence in distant metastases,

NOTE Confidence: 0.8070893

 $00:50:05.490 \longrightarrow 00:50:07.314$  and it's really unclear how we

NOTE Confidence: 0.8070893

 $00:50:07.314 \rightarrow 00:50:09.058$  can regulate the immune system

NOTE Confidence: 0.8070893

 $00:50:09.058 \rightarrow 00:50:10.946$  through these different mechanisms,

NOTE Confidence: 0.8070893

 $00{:}50{:}10.950 \dashrightarrow 00{:}50{:}13.605$  and this is a you know from a paper

NOTE Confidence: 0.8070893

00:50:13.605 - 00:50:16.410 from current oncology reports in 2020,

NOTE Confidence: 0.8070893

 $00:50:16.410 \longrightarrow 00:50:18.230$  which shows a very complex.

NOTE Confidence: 0.8445389

 $00{:}50{:}20{.}460 \dashrightarrow 00{:}50{:}23{.}169$  I used paradigm in how we know the rapy can

 $00:50:23.169 \rightarrow 00:50:26.279$  be used in the setting of chemoembolization,

NOTE Confidence: 0.8445389

 $00{:}50{:}26.280 \dashrightarrow 00{:}50{:}27.606$  radio embolization, inflation etc.

NOTE Confidence: 0.8445389

 $00:50:27.606 \longrightarrow 00:50:30.258$  So there is an opportunity for

NOTE Confidence: 0.8445389

 $00:50:30.258 \rightarrow 00:50:31.966$  potential synergy with these

NOTE Confidence: 0.8445389

 $00{:}50{:}31.966 \dashrightarrow 00{:}50{:}33.966$  checkpoint inhibitors with some of

NOTE Confidence: 0.8445389

 $00{:}50{:}33{.}966 \dashrightarrow 00{:}50{:}35{.}909$  the the rapies that we can offer.

NOTE Confidence: 0.8445389

 $00{:}50{:}35{.}910 \dashrightarrow 00{:}50{:}38{.}598$  And this just shows how taste and

NOTE Confidence: 0.8445389

 $00:50:38.598 \rightarrow 00:50:41.029$  ablation and even breakey therapy,

NOTE Confidence: 0.8445389

 $00{:}50{:}41.030 \dashrightarrow 00{:}50{:}43.165$  really can result in both

NOTE Confidence: 0.8445389

 $00:50:43.165 \rightarrow 00:50:44.873$  immunostimulation an immune suppression.

NOTE Confidence: 0.8445389

 $00:50:44.880 \longrightarrow 00:50:47.346$  I don't want to get into

NOTE Confidence: 0.8445389

 $00:50:47.346 \longrightarrow 00:50:49.570$  all the details of this,

NOTE Confidence: 0.8445389

 $00:50:49.570 \rightarrow 00:50:52.156$  but basically it's something where we

NOTE Confidence: 0.8445389

 $00:50:52.156 \rightarrow 00:50:54.308$  can utilize the intervention oncology

NOTE Confidence: 0.8445389

 $00{:}50{:}54{.}308 \dashrightarrow 00{:}50{:}56{.}462$  the rapies in order to really delve

NOTE Confidence: 0.8445389

 $00:50:56.462 \rightarrow 00:50:59.569$  into how we can treat patients much

- NOTE Confidence: 0.8445389
- $00:50:59.569 \rightarrow 00:51:01.529$  more effectively with immunotherapy.

 $00{:}51{:}01{.}530 \dashrightarrow 00{:}51{:}04{.}296$  And then this just shows that

NOTE Confidence: 0.8445389

 $00:51:04.296 \rightarrow 00:51:06.890$  there are numerous ongoing studies.

NOTE Confidence: 0.8445389

00:51:06.890 --> 00:51:10.316 Looking at the combination of immune

NOTE Confidence: 0.8445389

 $00{:}51{:}10{.}316$  -->  $00{:}51{:}13{.}024$  the rapy with locoregional the rapy and

NOTE Confidence: 0.8445389

 $00{:}51{:}13.024 \dashrightarrow 00{:}51{:}16.030$  this is a study I just wanted to show

NOTE Confidence: 0.8445389

 $00:51:16.121 \rightarrow 00:51:19.465$  one that just got activated two days ago.

NOTE Confidence: 0.8445389

00:51:19.470 --> 00:51:21.078 At Yale Cancer Center,

NOTE Confidence: 0.8445389

 $00{:}51{:}21.078 \dashrightarrow 00{:}51{:}23.490$  which probably need to discuss soon.

NOTE Confidence: 0.8445389

 $00{:}51{:}23.490 \dashrightarrow 00{:}51{:}26.274$  If Mario allows me to at our upcoming

NOTE Confidence: 0.8445389

 $00{:}51{:}26{.}274 \dashrightarrow 00{:}51{:}29{.}118$  one of our upcoming tumor boards,

NOTE Confidence: 0.8445389

 $00{:}51{:}29{.}120 \dashrightarrow 00{:}51{:}31{.}927$  which is the Merkley 012 clinical trial,

NOTE Confidence: 0.8445389

 $00:51:31.930 \rightarrow 00:51:34.744$  which is basically taste is the backbone,

NOTE Confidence: 0.8445389

 $00{:}51{:}34{.}750 \dashrightarrow 00{:}51{:}36{.}760$  with or without, you know,

NOTE Confidence: 0.8445389

 $00:51:36.760 \longrightarrow 00:51:37.142$  therapy,

 $00:51:37.142 \longrightarrow 00:51:40.198$  which in this case is is pen bro

NOTE Confidence: 0.8445389

00:51:40.198 --> 00:51:42.297 plus at multi kinase inhibitor

NOTE Confidence: 0.8445389

 $00{:}51{:}42{.}297 \dashrightarrow 00{:}51{:}45{.}626$  which is live at and if so each

NOTE Confidence: 0.8445389

 $00:51:45.626 \rightarrow 00:51:48.419$  patient will get taste and then they

NOTE Confidence: 0.8445389

 $00:51:48.419 \rightarrow 00:51:50.900$  may or may not be randomized.

NOTE Confidence: 0.8445389

 $00:51:50.900 \rightarrow 00:51:52.550$  Those they get the systemic

NOTE Confidence: 0.8445389

 $00:51:52.550 \rightarrow 00:51:54.200$  therapy and those that don't,

NOTE Confidence: 0.8445389

 $00:51:54.200 \longrightarrow 00:51:56.840$  but we can go into that another time.

NOTE Confidence: 0.8445389

00:51:56.840 --> 00:51:57.526 And Lastly,

NOTE Confidence: 0.8445389

 $00:51:57.526 \rightarrow 00:51:59.584$  I just wanted to show that

NOTE Confidence: 0.8445389

 $00:51:59.584 \longrightarrow 00:52:01.989$  we do treat other patients.

NOTE Confidence: 0.8445389

 $00:52:01.990 \longrightarrow 00:52:04.326$  I just have a couple of cases to

NOTE Confidence: 0.8445389

 $00{:}52{:}04{.}326 \dashrightarrow 00{:}52{:}07{.}107$  show that this is a patient with

NOTE Confidence: 0.8445389

 $00{:}52{:}07.107 \dashrightarrow 00{:}52{:}08.807$  colorectal cancer that followed.

NOTE Confidence: 0.8445389

 $00{:}52{:}08{.}810 \dashrightarrow 00{:}52{:}09{.}884$  They failed multiple

NOTE Confidence: 0.8445389

 $00:52:09.884 \rightarrow 00:52:11.316$  chemotherapeutic Regimen's who was,

- NOTE Confidence: 0.8445389
- $00:52:11.320 \rightarrow 00:52:12.652$  as you can see,

 $00{:}52{:}12.652 \dashrightarrow 00{:}52{:}14.650$  has innumerable tumors with with this

NOTE Confidence: 0.8445389

 $00{:}52{:}14.721 \dashrightarrow 00{:}52{:}16.796$  colorectal cancer did have normal

NOTE Confidence: 0.8445389

 $00:52:16.796 \rightarrow 00:52:18.871$  underlying liver function and we

NOTE Confidence: 0.8445389

 $00:52:18.941 \dashrightarrow 00:52:20.825$  treated this patient with white 90

NOTE Confidence: 0.8445389

 $00{:}52{:}20.825 \dashrightarrow 00{:}52{:}23.658$  and you can see that there's a clear

NOTE Confidence: 0.8445389

 $00{:}52{:}23.658 \dashrightarrow 00{:}52{:}26.405$  impact on the tumor response and I

NOTE Confidence: 0.8445389

 $00:52:26.405 \rightarrow 00:52:29.267$  don't want to go into all the surf locks,

NOTE Confidence: 0.8445389

 $00{:}52{:}29{.}270 \dashrightarrow 00{:}52{:}30{.}774$  data and all that,

NOTE Confidence: 0.8445389

 $00:52:30.774 \longrightarrow 00:52:32.654$  but just be aware that.

NOTE Confidence: 0.8445389

 $00:52:32.660 \longrightarrow 00:52:34.556$  We can do it for this.

NOTE Confidence: 0.8445389

 $00{:}52{:}34{.}560 \dashrightarrow 00{:}52{:}37{.}413$  This is a patient that was referred to me.

NOTE Confidence: 0.8445389

 $00:52:37.420 \longrightarrow 00:52:37.736$  Well,

NOTE Confidence: 0.8445389

 $00{:}52{:}37{.}736 \dashrightarrow 00{:}52{:}40{.}264$  it was a Cornell from a radiation on cologist.

NOTE Confidence: 0.8445389

 $00{:}52{:}40{.}270 \dashrightarrow 00{:}52{:}42{.}489$  Actually with chair who had breast cancer,

- $00:52:42.490 \rightarrow 00:52:42.821$  liver,
- NOTE Confidence: 0.8445389

 $00:52:42.821 \rightarrow 00:52:43.152$  Mets.

NOTE Confidence: 0.8445389

00:52:43.152 --> 00:52:45.469 And as you can see it's really

NOTE Confidence: 0.8445389

 $00:52:45.469 \longrightarrow 00:52:47.258$  really overtaking the liver.

NOTE Confidence: 0.8445389

 $00{:}52{:}47{.}260 \dashrightarrow 00{:}52{:}49{.}897$  I was asked to see if we can really

NOTE Confidence: 0.8445389

 $00{:}52{:}49{.}897 \dashrightarrow 00{:}52{:}52{.}451$  do anything for this patient and we NOTE Confidence: 0.8445389

 $00{:}52{:}52{.}451 \dashrightarrow 00{:}52{:}55{.}586$  did why 90 the page and then this

NOTE Confidence: 0.8445389

 $00{:}52{:}55{.}586 \dashrightarrow 00{:}52{:}57{.}992$  was a situation where the patient

NOTE Confidence: 0.8445389

 $00{:}52{:}58.000 \dashrightarrow 00{:}53{:}00.464$  was able to see even though she

NOTE Confidence: 0.8445389

 $00:53:00.464 \rightarrow 00:53:02.650$  did succumb not within a year,

NOTE Confidence: 0.8445389

 $00{:}53{:}02.650 \dashrightarrow 00{:}53{:}04.757$  she was able to see her son's

NOTE Confidence: 0.8445389

 $00{:}53{:}04.757 \dashrightarrow 00{:}53{:}07.018$  wedding and also spend their her

NOTE Confidence: 0.8445389

 $00{:}53{:}07{.}018 \dashrightarrow 00{:}53{:}08{.}738$  last Thanks giving with family.

NOTE Confidence: 0.8445389

00:53:08.740 --> 00:53:09.456 So again,

NOTE Confidence: 0.8445389

 $00{:}53{:}09{.}456 \dashrightarrow 00{:}53{:}12{.}320$  this is where the palliative nature comes in.

NOTE Confidence: 0.8445389

 $00:53:12.320 \longrightarrow 00:53:13.394$  And then Lastly,

- NOTE Confidence: 0.8445389
- $00:53:13.394 \rightarrow 00:53:15.900$  this is a patient with pancreatic cancer,

 $00{:}53{:}15{.}900 \dashrightarrow 00{:}53{:}17{.}800$  who we were able to.

NOTE Confidence: 0.8445389

 $00{:}53{:}17.800 \dashrightarrow 00{:}53{:}19.275$  Treat with conventional tastes in

NOTE Confidence: 0.8445389

 $00:53:19.275 \longrightarrow 00:53:22.130$  a term that I call like just like

NOTE Confidence: 0.8445389

 $00:53:22.130 \longrightarrow 00:53:23.882$  radiation segmentectomy something I

NOTE Confidence: 0.8445389

00:53:23.882 --> 00:53:26.050 call now chemoembolization segmentectomy,

NOTE Confidence: 0.8445389

00:53:26.050 -> 00:53:28.408 where we can actually you know,

NOTE Confidence: 0.8445389

 $00:53:28.410 \longrightarrow 00:53:29.577$  in pancreatic cancer,

NOTE Confidence: 0.8445389

 $00{:}53{:}29{.}577 \dashrightarrow 00{:}53{:}32{.}300$  we know these patients have very hypo

NOTE Confidence: 0.8445389

00:53:32.366 - 00:53:34.934 vascular tumors in a very dismal

NOTE Confidence: 0.8445389

00:53:34.934 --> 00:53:36.646 plastic fibrotic tumor structure

NOTE Confidence: 0.80918545

 $00:53:36.717 \rightarrow 00:53:39.413$  where if we can treat the entire segment,

NOTE Confidence: 0.80918545

 $00:53:39.420 \longrightarrow 00:53:41.766$  the tumors cannot live, so that's

NOTE Confidence: 0.80918545

 $00:53:41.766 \rightarrow 00:53:44.130$  something that we're also looking at,

NOTE Confidence: 0.80918545

 $00{:}53{:}44{.}130 \dashrightarrow 00{:}53{:}47{.}775$  so I wanted to make it clear that you

 $00:53:47.775 \rightarrow 00:53:51.369$  know HCC is not the only thing we do.

NOTE Confidence: 0.80918545

 $00{:}53{:}51{.}370 \dashrightarrow 00{:}53{:}53{.}596$  If you do have patients that have

NOTE Confidence: 0.80918545

 $00:53:53.596 \rightarrow 00:53:55.764$  other types of tumors, we're actually

NOTE Confidence: 0.80918545

 $00:53:55.764 \rightarrow 00:53:58.123$  able to really treat those as well,

NOTE Confidence: 0.80918545

 $00:53:58.130 \longrightarrow 00:54:01.775$  and we're happy to speak to you about them.

NOTE Confidence: 0.80918545

00:54:01.780 --> 00:54:04.426 So in conclusion, I hope I demonstrated NOTE Confidence: 0.80918545

 $00:54:04.426 \longrightarrow 00:54:06.691$  their local regional therapies do play

NOTE Confidence: 0.80918545

 $00:54:06.691 \rightarrow 00:54:09.162$  an important role in the management of

NOTE Confidence: 0.80918545

 $00{:}54{:}09{.}231 \dashrightarrow 00{:}54{:}11.817$  both primary and metastatic liver cancer.

NOTE Confidence: 0.80918545

 $00{:}54{:}11{.}820 \dashrightarrow 00{:}54{:}14{.}130$  They often provide benefit for survival,

NOTE Confidence: 0.80918545

00:54:14.130 - 00:54:15.360 local tumor control,

NOTE Confidence: 0.80918545

 $00:54:15.360 \longrightarrow 00:54:17.820$  and improve quality of life compared

NOTE Confidence: 0.80918545

 $00:54:17.820 \longrightarrow 00:54:20.258$  to and in some cases, you know,

NOTE Confidence: 0.80918545

 $00:54:20.258 \longrightarrow 00:54:22.053$  compared to resection and compared

NOTE Confidence: 0.80918545

 $00:54:22.053 \rightarrow 00:54:23.780$  to some systemic therapies,

NOTE Confidence: 0.80918545

 $00:54:23.780 \rightarrow 00:54:25.710$  it may result in cure.

- NOTE Confidence: 0.80918545
- $00:54:25.710 \rightarrow 00:54:26.928$  In some patients,
- NOTE Confidence: 0.80918545
- $00{:}54{:}26{.}928 \dashrightarrow 00{:}54{:}29{.}770$  such as those that have solitaire E
- NOTE Confidence: 0.80918545
- $00{:}54{:}29{.}848 \dashrightarrow 00{:}54{:}32{.}188$  small HCC's and can enable patients
- NOTE Confidence: 0.80918545
- $00:54:32.188 \longrightarrow 00:54:34.830$  to be bridge or down stage 2.
- NOTE Confidence: 0.80918545
- $00:54:34.830 \rightarrow 00:54:37.500$  Transplant or surgery?
- NOTE Confidence: 0.80918545
- 00:54:37.500 --> 00:54:38.679 There's various sublative
- NOTE Confidence: 0.80918545
- $00:54:38.679 \rightarrow 00:54:39.858$  entrance arterial therapies,
- NOTE Confidence: 0.80918545
- $00:54:39.860 \longrightarrow 00:54:41.830$  and they have very different
- NOTE Confidence: 0.80918545
- $00:54:41.830 \longrightarrow 00:54:43.406$  mechanism of of actions,
- NOTE Confidence: 0.80918545
- $00:54:43.410 \longrightarrow 00:54:45.774$  but I think when looking at
- NOTE Confidence: 0.80918545
- $00:54:45.774 \longrightarrow 00:54:47.350$  these kinds of the rapies,
- NOTE Confidence: 0.80918545
- $00{:}54{:}47{.}350 \dashrightarrow 00{:}54{:}49{.}275$  it's important to really understand
- NOTE Confidence: 0.80918545
- $00{:}54{:}49{.}275 \dashrightarrow 00{:}54{:}52{.}065$  the real true nuances of the the rapies
- NOTE Confidence: 0.80918545
- $00{:}54{:}52.065 \dashrightarrow 00{:}54{:}54.055$  that you're either performing or
- NOTE Confidence: 0.80918545
- $00{:}54{:}54{.}055 \dashrightarrow 00{:}54{:}56{.}856$  requesting is a refer so that you
- NOTE Confidence: 0.80918545

 $00:54:56.856 \rightarrow 00:54:58.781$  really understand what we're talking

NOTE Confidence: 0.80918545

 $00{:}54{:}58{.}781 \dashrightarrow 00{:}55{:}01{.}612$  about and how to read reports when

NOTE Confidence: 0.80918545

 $00:55:01.612 \rightarrow 00:55:03.846$  they come out saying ablation

NOTE Confidence: 0.80918545

 $00:55:03.846 \rightarrow 00:55:05.910$  or a key mobilization.

NOTE Confidence: 0.80918545

 $00{:}55{:}05{.}910 \dashrightarrow 00{:}55{:}08{.}374$  I've also hope to have shown advanced

NOTE Confidence: 0.80918545

 $00{:}55{:}08{.}374 \dashrightarrow 00{:}55{:}10{.}270$  that both advanced imaging an

NOTE Confidence: 0.80918545

 $00:55:10.270 \rightarrow 00:55:12.190$  catheter based technology has been

NOTE Confidence: 0.80918545

 $00:55:12.190 \rightarrow 00:55:14.670$  very helpful in treatment decisions.

NOTE Confidence: 0.80918545

 $00{:}55{:}14.670$  -->  $00{:}55{:}16.386$  By providing intraprocedural guidance NOTE Confidence: 0.80918545

 $00{:}55{:}16{.}386 \dashrightarrow 00{:}55{:}18{.}531$  and the rapeutic confirmation that we

NOTE Confidence: 0.80918545

 $00{:}55{:}18{.}531 \dashrightarrow 00{:}55{:}21{.}029$  were able to effectively treat the tumors,

NOTE Confidence: 0.80918545

 $00{:}55{:}21.030 \dashrightarrow 00{:}55{:}23.179$  and we're also now on the precipice

NOTE Confidence: 0.80918545

 $00{:}55{:}23.179 \dashrightarrow 00{:}55{:}25.302$  of looking at combination the rapies

NOTE Confidence: 0.80918545

 $00{:}55{:}25{.}302 \dashrightarrow 00{:}55{:}26{.}997$  which appear promising,

NOTE Confidence: 0.80918545

 $00:55:27.000 \dashrightarrow 00:55:29.786$  such as those found in immuno oncology.

NOTE Confidence: 0.80918545

 $00:55:29.790 \dashrightarrow 00:55:32.966$  So with that I think I'll stop here.

- NOTE Confidence: 0.83673346
- 00:55:35.820 --> 00:55:38.446 Think I was on time, but you know I'm
- NOTE Confidence: 0.83673346
- $00{:}55{:}38{.}446 \dashrightarrow 00{:}55{:}40{.}760$  sure we have some time for questions.
- NOTE Confidence: 0.87695014
- 00:55:42.060 --> 00:55:43.128 Thank you very
- NOTE Confidence: 0.87695014
- $00{:}55{:}43.130 \dashrightarrow 00{:}55{:}47.062$  much, Sir David. For any body has a
- NOTE Confidence: 0.87695014
- $00:55:47.062 \rightarrow 00:55:49.612$  question and type type it please in
- NOTE Confidence: 0.87695014
- $00:55:49.612 \dashrightarrow 00:55:51.929$  the chat and then we will respond.
- NOTE Confidence: 0.87695014
- $00:55:51.930 \longrightarrow 00:55:54.576$  In the end I mean by what
- NOTE Confidence: 0.87695014
- 00:55:54.576 --> 00:55:56.690 people may be thinking.
- NOTE Confidence: 0.87695014
- $00{:}55{:}56{.}690 \dashrightarrow 00{:}56{:}00{.}154$  I want to thank you for the these.
- NOTE Confidence: 0.87695014
- $00:56:00.160 \rightarrow 00:56:03.619$  Are this great review of all the possible.
- NOTE Confidence: 0.75699204
- $00:56:05.740 \longrightarrow 00:56:08.350$  Approach is there.
- NOTE Confidence: 0.75699204
- $00{:}56{:}08{.}350 \dashrightarrow 00{:}56{:}09{.}826$  Interventional radiology can can
- NOTE Confidence: 0.75699204
- $00:56:09.826 \rightarrow 00:56:12.040$  provide for the treatment of primary,
- NOTE Confidence: 0.75699204
- $00:56:12.040 \longrightarrow 00:56:13.126$  secondary liver tumor.
- NOTE Confidence: 0.75699204
- $00{:}56{:}13.126 \dashrightarrow 00{:}56{:}16.435$  I mean from my own point of view, I,
- NOTE Confidence: 0.75699204

 $00:56:16.435 \rightarrow 00:56:19.115$  I think you really showed the complexity of

NOTE Confidence: 0.75699204

 $00:56:19.115 \rightarrow 00:56:21.997$  the dictation making that is behind this.

NOTE Confidence: 0.75699204

 $00:56:22.000 \rightarrow 00:56:25.312$  It's you know, as you said at the beginning,

NOTE Confidence: 0.75699204

 $00:56:25.320 \longrightarrow 00:56:27.910$  we think in a very simplified way.

NOTE Confidence: 0.75699204

 $00:56:27.910 \longrightarrow 00:56:31.095$  Yeah, let's sub later if aid is.

NOTE Confidence: 0.75699204

 $00:56:31.100 \longrightarrow 00:56:35.438$  But in reality, you really do.

NOTE Confidence: 0.75699204

 $00{:}56{:}35{.}440 \dashrightarrow 00{:}56{:}38{.}618$  Send the patient to centers that have

NOTE Confidence: 0.75699204

 $00:56:38.618 \rightarrow 00:56:41.048$  all these possibilities, Anan abilities,

NOTE Confidence: 0.75699204

 $00{:}56{:}41.048 \dashrightarrow 00{:}56{:}43.718$  and they can really tailor.

NOTE Confidence: 0.75699204

 $00:56:43.720 \rightarrow 00:56:46.730$  The treatment of the patient to the.

NOTE Confidence: 0.73697114

 $00{:}56{:}49{.}160 \dashrightarrow 00{:}56{:}50{.}588$  To amend personalized treatment

NOTE Confidence: 0.73697114

 $00:56:50.588 \rightarrow 00:56:53.110$  to the patient, and. Great.

NOTE Confidence: 0.7393944

 $00{:}56{:}55{.}150 \dashrightarrow 00{:}56{:}58{.}158$  So we have a question from even a

NOTE Confidence: 0.7393944

 $00:56:58.158 \rightarrow 00:57:00.990$  rukundo great informative presentation.

NOTE Confidence: 0.7393944

 $00:57:00.990 \dashrightarrow 00:57:02.938$  My questions and terminology,

NOTE Confidence: 0.7393944

 $00:57:02.938 \rightarrow 00:57:04.886$  embolus therapy versus embolization.

- NOTE Confidence: 0.7393944
- $00:57:04.890 \longrightarrow 00:57:06.838$  Is there any difference?

 $00{:}57{:}08.870 \dashrightarrow 00{:}57{:}10.960$  Well, that's actually a very

NOTE Confidence: 0.8381277

 $00{:}57{:}10.960 \dashrightarrow 00{:}57{:}13.050$  interesting question because I like

NOTE Confidence: 0.8381277

 $00:57:13.120 \rightarrow 00:57:15.538$  to always call things emblow therapy.

NOTE Confidence: 0.8381277

 $00:57:15.540 \longrightarrow 00:57:17.625$  Now clearly there's really not

NOTE Confidence: 0.8381277

00:57:17.625 --> 00:57:19.293 a major difference between.

NOTE Confidence: 0.8381277

 $00:57:19.300 \rightarrow 00:57:21.790$  Well, I guess the term embolization

NOTE Confidence: 0.8381277

 $00:57:21.790 \longrightarrow 00:57:23.880$  implies that similar to like,

NOTE Confidence: 0.8381277

 $00{:}57{:}23.880 \dashrightarrow 00{:}57{:}25.965$  what a pulmonary embolism uses

NOTE Confidence: 0.8381277

00:57:25.965 --> 00:57:28.050 that you're taking a catheter,

NOTE Confidence: 0.8381277

 $00{:}57{:}28.050 \dashrightarrow 00{:}57{:}30.570$  and your introgenic Lee moving one

NOTE Confidence: 0.8381277

 $00{:}57{:}30{.}570 \dashrightarrow 00{:}57{:}33{.}469$  particle or or structure to another area.

NOTE Confidence: 0.8381277

 $00:57:33.470 \rightarrow 00:57:36.815$  Now that could be with one particle, right?

NOTE Confidence: 0.8381277

 $00{:}57{:}36.815 \dashrightarrow 00{:}57{:}39.790$  But that doesn't have to be with.

NOTE Confidence: 0.8381277

 $00:57:39.790 \rightarrow 00:57:42.555$  The whole thing, so I guess emblow

00:57:42.555 --> 00:57:44.400 therapy is actually defined.

NOTE Confidence: 0.8381277

 $00{:}57{:}44{.}400 \dashrightarrow 00{:}57{:}47{.}065$  Should be defined as the

NOTE Confidence: 0.8381277

 $00{:}57{:}47.065 \dashrightarrow 00{:}57{:}49.197$  treatment of patients with.

NOTE Confidence: 0.8381277

 $00:57:49.200 \longrightarrow 00:57:51.420$  You know, using these transcatheter

NOTE Confidence: 0.8381277

 $00:57:51.420 \longrightarrow 00:57:52.308$  transarterial methods,

NOTE Confidence: 0.8381277

00:57:52.310 --> 00:57:54.860 but I guess embolization doesn't

NOTE Confidence: 0.8381277

 $00:57:54.860 \dashrightarrow 00:57:57.410$  necessarily have to be the rapeutic.

NOTE Confidence: 0.8381277

 $00{:}57{:}57{.}410 \dashrightarrow 00{:}57{:}59{.}318$  So that's actually a great I

NOTE Confidence: 0.8381277

 $00{:}57{:}59{.}318$  -->  $00{:}58{:}01{.}250$  think about that all the time.

NOTE Confidence: 0.8381277

 $00:58:01.250 \rightarrow 00:58:04.130$  And you know when we talk about in reports,

NOTE Confidence: 0.8381277

 $00:58:04.130 \longrightarrow 00:58:05.730$  for example, embolization of that,

NOTE Confidence: 0.8381277

 $00:58:05.730 \longrightarrow 00:58:08.169$  would you know?

NOTE Confidence: 0.8381277

 $00{:}58{:}08{.}170 \dashrightarrow 00{:}58{:}10{.}036$  And I think that's the actual.

NOTE Confidence: 0.8381277

 $00{:}58{:}10.040 \dashrightarrow 00{:}58{:}11.288$  That's the actual difference.

NOTE Confidence: 0.42469427

00:58:14.410 --> 00:58:19.150 I come. Baby, do you have?

NOTE Confidence: 0.42469427

00:58:19.150 --> 00:58:22.340 Can you expand a little bit of

- NOTE Confidence: 0.42469427
- $00{:}58{:}22{.}340 \dashrightarrow 00{:}58{:}24{.}609$  the possible adverse effect of

 $00:58:24.610 \rightarrow 00:58:27.930$  combination therapy with the. They

NOTE Confidence: 0.7514345

 $00:58:27.930 \rightarrow 00:58:30.950$  send the email uncle immunotherapy.

NOTE Confidence: 0.84548587

 $00:58:32.750 \rightarrow 00:58:34.475$  Well, basically we don't know

NOTE Confidence: 0.84548587

00:58:34.475 --> 00:58:36.205 that yet, right? I mean,

NOTE Confidence: 0.84548587

 $00:58:36.205 \rightarrow 00:58:37.930$  that's why we're doing these.

NOTE Confidence: 0.84548587

 $00:58:37.930 \rightarrow 00:58:40.000$  That's why we're doing these studies.

NOTE Confidence: 0.84548587

00:58:40.000 --> 00:58:41.029 I mean basically.

NOTE Confidence: 0.8167627

 $00{:}58{:}43.050 \dashrightarrow 00{:}58{:}47.018$  We also we also don't know if you

NOTE Confidence: 0.8167627

 $00{:}58{:}47.018 \dashrightarrow 00{:}58{:}51.018$  should do the if you should do the.

NOTE Confidence: 0.8167627

 $00:58:51.020 \rightarrow 00:58:53.708$  There are which therapy used to 1st right?

NOTE Confidence: 0.8167627

00:58:53.710 --> 00:58:56.598 Like should you do the should you start NOTTE C = 6 L = -0.0167697

NOTE Confidence: 0.8167627

 $00{:}58{:}56{.}598 \dashrightarrow 00{:}58{:}59{.}774$  with taste and and then follow it with

NOTE Confidence: 0.8167627

 $00{:}58{:}59{.}774 \dashrightarrow 00{:}59{:}02{.}186$  immuno therapy or should you start with NOTE Confidence: 0.8167627

00:59:02.186 --> 00:59:05.186 your therapy and then do the taste right? NOTE Confidence: 0.8167627

 $00:59:05.190 \longrightarrow 00:59:08.228$  You know each. I guess trial is

NOTE Confidence: 0.8167627

 $00{:}59{:}08{.}228 \dashrightarrow 00{:}59{:}11{.}680$  very different, right? And each.

NOTE Confidence: 0.8167627

 $00{:}59{:}11.680 \dashrightarrow 00{:}59{:}14.725$  I guess the rapy has its own company,

NOTE Confidence: 0.8167627

 $00{:}59{:}14.730 \dashrightarrow 00{:}59{:}18.380$  has its own adverse events.

NOTE Confidence: 0.8167627

 $00:59:18.380 \longrightarrow 00:59:21.776$  The thought is that you would

NOTE Confidence: 0.8167627

00:59:21.776 --> 00:59:24.122 do the immunotherapy. You know,

NOTE Confidence: 0.8167627

 $00{:}59{:}24.122 \dashrightarrow 00{:}59{:}26.690$  after the at least two weeks you would

NOTE Confidence: 0.8167627

 $00:59:26.759 \rightarrow 00:59:29.769$  do the therapy immunotherapy after the taste.

NOTE Confidence: 0.8167627

 $00{:}59{:}29{.}770 \dashrightarrow 00{:}59{:}32{.}388$  That by then the tastes adverse events

NOTE Confidence: 0.8167627

 $00:59:32.388 \rightarrow 00:59:35.316$  should already be taken out of the equation.

NOTE Confidence: 0.8167627

 $00{:}59{:}35{.}320 \dashrightarrow 00{:}59{:}37{.}540$  Because in the time that you're

NOTE Confidence: 0.8167627

00:59:37.540 --> 00:59:38.650 getting the immunotherapy,

NOTE Confidence: 0.8167627

 $00:59:38.650 \dashrightarrow 00:59:40.130$  those patients would already

NOTE Confidence: 0.8167627

 $00:59:40.130 \longrightarrow 00:59:41.610$  be beyond that time.

NOTE Confidence: 0.8167627

 $00{:}59{:}41.610 \dashrightarrow 00{:}59{:}43.983$  So in terms of the actual combination

NOTE Confidence: 0.8167627

00:59:43.983 --> 00:59:47.346 is kind of hard to understand. I mean,

- NOTE Confidence: 0.8167627
- $00:59:47.346 \longrightarrow 00:59:50.124$  particularly in the Merck study where.

00:59:50.130 --> 00:59:51.950 Pizza getting taste first.

NOTE Confidence: 0.8167627

00:59:51.950 --> 00:59:54.500 So you know, we still don't know.

NOTE Confidence: 0.8167627

00:59:54.500 --> 00:59:55.090 I mean,

NOTE Confidence: 0.8167627

 $00:59:55.090 \rightarrow 00:59:57.727$  we're still very early in in all of these,

NOTE Confidence: 0.8167627

 $00{:}59{:}57{.}730 \dashrightarrow 00{:}59{:}59{.}788$  you know, in all of these studies.

NOTE Confidence: 0.8167627

 $00:59:59.790 \dashrightarrow 01:00:00.272$  So I.

NOTE Confidence: 0.8167627

 $01{:}00{:}00.272 \dashrightarrow 01{:}00{:}02.200$  I don't have a very good answer yet.

NOTE Confidence: 0.5690657

 $01{:}00{:}04{.}210 \dashrightarrow 01{:}00{:}07{.}205$  Switch an ATC and different

NOTE Confidence: 0.5690657

01:00:07.205 --> 01:00:09.002 histopathology dash subtypes

NOTE Confidence: 0.5690657

 $01{:}00{:}09{.}002 \dashrightarrow 01{:}00{:}11{.}639$  with different molecular bases.

NOTE Confidence: 0.5690657

 $01:00:11.640 \longrightarrow 01:00:15.010$  Do you predict?

NOTE Confidence: 0.5690657

 $01{:}00{:}15{.}010 \dashrightarrow 01{:}00{:}17{.}369$  If there is a possibility that the

NOTE Confidence: 0.5690657

01:00:17.369 --> 01:00:19.655 different subtype of ACC can be

NOTE Confidence: 0.5690657

 $01:00:19.655 \rightarrow 01:00:21.271$  treated differently by locoregional

 $01:00:21.271 \rightarrow 01:00:23.609$  therapies and they, I would have

NOTE Confidence: 0.81619465

 $01:00:23.610 \longrightarrow 01:00:25.860$  to say the answer is yes.

NOTE Confidence: 0.81619465

 $01{:}00{:}25.860 \dashrightarrow 01{:}00{:}28.428$  The reason why I think that is that NOTE Confidence: 0.81619465

 $01:00:28.428 \rightarrow 01:00:30.932$  there's a very big difference is as

NOTE Confidence: 0.81619465

01:00:30.932 --> 01:00:33.648 you know in colon cancer and right

NOTE Confidence: 0.81619465

01:00:33.648 --> 01:00:36.216 sided versus left sided colon cancer

NOTE Confidence: 0.81619465

 $01{:}00{:}36{.}216$  -->  $01{:}00{:}38{.}636$  and actuality when there's been studies

NOTE Confidence: 0.81619465

 $01{:}00{:}38.636 \dashrightarrow 01{:}00{:}40.970$  out there that with colon cancer

NOTE Confidence: 0.81619465

01:00:41.038 --> 01:00:43.090 that there's when patients get why

NOTE Confidence: 0.81619465

 $01:00:43.090 \rightarrow 01:00:45.798$  90 to deliver in patients that have.

NOTE Confidence: 0.81619465

01:00:45.800 --> 01:00:47.910 Different types of colon cancer.

NOTE Confidence: 0.81619465

 $01:00:47.910 \longrightarrow 01:00:51.150$  They actually get different.

NOTE Confidence: 0.81619465

 $01{:}00{:}51{.}150 \dashrightarrow 01{:}00{:}53{.}140$  Response rates.

NOTE Confidence: 0.81619465

 $01{:}00{:}53.140 \dashrightarrow 01{:}00{:}56.844$  So that way you would actually be able

NOTE Confidence: 0.81619465

 $01{:}00{:}56.844 \dashrightarrow 01{:}01{:}00.959$  to tail or it so I do believe that in time.

NOTE Confidence: 0.81619465

01:01:00.960 --> 01:01:02.630 You know, as I said,

 $01:01:02.630 \longrightarrow 01:01:04.798$  I mean right now we're only like 40

NOTE Confidence: 0.81619465

01:01:04.798 --> 01:01:06.907 years into really treating patients with

NOTE Confidence: 0.81619465

01:01:06.907 --> 01:01:09.640 these kinds of the rapies for liver cancer.

NOTE Confidence: 0.81619465

 $01:01:09.640 \longrightarrow 01:01:12.475$  So which means to me that in 100 years NOTE Confidence: 0.81619465

01:01:12.475 --> 01:01:15.067 we're going to be so far advanced that

NOTE Confidence: 0.81619465

01:01:15.067 --> 01:01:17.657 I don't see how you wouldn't have,

NOTE Confidence: 0.81619465

 $01{:}01{:}17.660 \dashrightarrow 01{:}01{:}19.712$  you know, genetics involved into a

NOTE Confidence: 0.81619465

 $01:01:19.712 \longrightarrow 01:01:20.738$  personalized treatment algorithm

NOTE Confidence: 0.81619465

 $01:01:20.738 \longrightarrow 01:01:22.338$  for these kinds of the rapies,

NOTE Confidence: 0.81619465

 $01{:}01{:}22{.}340 \dashrightarrow 01{:}01{:}24{.}664$  so that's what we're here to do.

NOTE Confidence: 0.81619465

 $01:01:24.670 \rightarrow 01:01:27.008$  That's why we're doing the research here,

NOTE Confidence: 0.81619465

 $01{:}01{:}27.010 \dashrightarrow 01{:}01{:}29.674$  so I think that that's a great question,

NOTE Confidence: 0.81619465

01:01:29.680 --> 01:01:30.908 and I think that.

NOTE Confidence: 0.81619465

01:01:30.908 --> 01:01:31.829 Like I said,

NOTE Confidence: 0.81619465

 $01:01:31.830 \rightarrow 01:01:33.244$  we're in the we're in the infancy.

 $01:01:34.220 \rightarrow 01:01:36.645$  So the agency is acquisitively

NOTE Confidence: 0.7461756

01:01:36.645 --> 01:01:39.075 rather sensitive. How do you

NOTE Confidence: 0.7461756

01:01:39.075 --> 01:01:41.997 decide between taste and why? 90?

NOTE Confidence: 0.7461756

 $01:01:41.997 \rightarrow 01:01:44.482$  Because in certain institution actually

NOTE Confidence: 0.7461756

 $01:01:44.482 \longrightarrow 01:01:47.320$  went 90 is preferably with days.

NOTE Confidence: 0.7461756

 $01:01:47.320 \longrightarrow 01:01:50.230$  Can you comment? So I thought

NOTE Confidence: 0.7461756

 $01{:}01{:}50{.}230 \dashrightarrow 01{:}01{:}55{.}080$  I had a slide and an and where it went,

NOTE Confidence: 0.7461756

 $01:01:55.080 \rightarrow 01:01:59.190$  which was a meta analysis of. And actually,

NOTE Confidence: 0.7461756

 $01:01:59.190 \longrightarrow 01:02:01.045$  the slide said how to decide now?

NOTE Confidence: 0.7461756

 $01:02:01.050 \longrightarrow 01:02:02.098$  Maybe I went through.

NOTE Confidence: 0.7461756

01:02:02.098 --> 01:02:03.980 Maybe I clicked the button too fast,

NOTE Confidence: 0.7461756

 $01:02:03.980 \longrightarrow 01:02:07.644$  but at the end of the taste.

NOTE Confidence: 0.7461756

01:02:07.650 --> 01:02:10.986 Question I thought I had a meta analysis

NOTE Confidence: 0.7461756

01:02:10.986 --> 01:02:14.575 lie which basically shows that there's very

NOTE Confidence: 0.7461756

01:02:14.575 --> 01:02:18.079 similar outcomes in both taste and MY90,

NOTE Confidence: 0.7461756

 $01:02:18.080 \longrightarrow 01:02:21.685$  so you know the way that we've

- NOTE Confidence: 0.7461756
- $01:02:21.685 \longrightarrow 01:02:25.349$  used to think about it is that.

 $01:02:25.350 \longrightarrow 01:02:28.262$  In in, in patients that were older patients

NOTE Confidence: 0.7461756

 $01:02:28.262 \rightarrow 01:02:31.580$  that you know we want to do it as outpatient.

NOTE Confidence: 0.7461756

 $01:02:31.580 \longrightarrow 01:02:32.964$  You know, back then,

NOTE Confidence: 0.7461756

 $01:02:32.964 \longrightarrow 01:02:34.348$  those were all considered.

NOTE Confidence: 0.7461756

 $01:02:34.350 \longrightarrow 01:02:36.080$  You know why 90 patients?

NOTE Confidence: 0.7461756

 $01:02:36.080 \longrightarrow 01:02:39.852$  OK? Now we do taste all the

NOTE Confidence: 0.7461756

 $01:02:39.852 \longrightarrow 01:02:41.680$  time as outpatient as well.

NOTE Confidence: 0.7461756

 $01:02:41.680 \rightarrow 01:02:44.857$  So when I'm looking at it I'm looking at,

NOTE Confidence: 0.7461756

 $01:02:44.860 \rightarrow 01:02:46.960$  I guess the.

NOTE Confidence: 0.7461756

 $01{:}02{:}46.960 \dashrightarrow 01{:}02{:}50.340$  The I guess you need to look at the patient.

NOTE Confidence: 0.7461756

 $01{:}02{:}50{.}340 \dashrightarrow 01{:}02{:}53{.}119$  In general the performance status you need

NOTE Confidence: 0.7461756

 $01{:}02{:}53{.}119 \dashrightarrow 01{:}02{:}56{.}417$  to look at is it low bar or BI lo bar.

NOTE Confidence: 0.7461756

 $01:02:56.420 \rightarrow 01:02:59.800$  You have to look at how you're going to like.

NOTE Confidence: 0.7461756

 $01{:}02{:}59{.}800 \dashrightarrow 01{:}03{:}02{.}250$  If tumors are all in different locations

- $01:03:02.250 \rightarrow 01:03:05.206$  where you have to cherry pick each each one.
- NOTE Confidence: 0.7461756
- $01:03:05.210 \longrightarrow 01:03:07.234$  Sometimes you opt for.

 $01{:}03{:}07{.}234 \dashrightarrow 01{:}03{:}09{.}258$  Radio embolization or the other

NOTE Confidence: 0.7461756

 $01:03:09.258 \longrightarrow 01:03:11.460$  one so so basically.

NOTE Confidence: 0.7461756

 $01:03:11.460 \longrightarrow 01:03:15.036$  If you have if you have

NOTE Confidence: 0.7461756

01:03:15.036 --> 01:03:18.490 multiple tumors in in a lobe.

NOTE Confidence: 0.7461756

 $01:03:18.490 \rightarrow 01:03:21.210$  And you're doing radio embolization.

NOTE Confidence: 0.7461756

 $01:03:21.210 \rightarrow 01:03:25.594$  You either have to treat the whole lobe.

NOTE Confidence: 0.7461756

01:03:25.600 --> 01:03:25.931 OK,

NOTE Confidence: 0.7461756

 $01:03:25.931 \rightarrow 01:03:28.910$  which is a very big low bar taste or

NOTE Confidence: 0.7461756

 $01:03:28.998 \longrightarrow 01:03:32.046$  you have to do all of this difficulty

NOTE Confidence: 0.7461756

 $01:03:32.046 \rightarrow 01:03:34.799$  which is changing out catheters,

NOTE Confidence: 0.7461756

 $01:03:34.800 \longrightarrow 01:03:35.616$  splitting doses.

NOTE Confidence: 0.7461756

01:03:35.616 --> 01:03:37.656 You know it's very complex

NOTE Confidence: 0.7461756

 $01:03:37.656 \rightarrow 01:03:39.998$  the way the anatomy is OK,

NOTE Confidence: 0.7461756

 $01:03:40.000 \longrightarrow 01:03:42.728$  so the other thing I said is that

- NOTE Confidence: 0.7461756
- 01:03:42.728 --> 01:03:44.601 sometimes you have patients where

01:03:44.601 --> 01:03:47.745 you don't know what you want to do

NOTE Confidence: 0.7461756

01:03:47.745 --> 01:03:50.105 and chemoembolization or the other

NOTE Confidence: 0.7461756

 $01:03:50.105 \rightarrow 01:03:52.502$  embolization is besides why 90.

NOTE Confidence: 0.7461756

 $01:03:52.502 \rightarrow 01:03:56.016$  Are ones where you can get them.

NOTE Confidence: 0.7461756

 $01{:}03{:}56{.}020 \dashrightarrow 01{:}03{:}59{.}396$  You can get the product off the shelf.

NOTE Confidence: 0.7461756

01:03:59.400 --> 01:03:59.753 OK,

NOTE Confidence: 0.7461756

 $01{:}03{:}59{.}753 \dashrightarrow 01{:}04{:}02{.}577$  so instead of having to order it and

NOTE Confidence: 0.7461756

 $01{:}04{:}02{.}577 \dashrightarrow 01{:}04{:}05{.}232$  and waiting and all that kind of

NOTE Confidence: 0.7461756

 $01{:}04{:}05{.}232 \dashrightarrow 01{:}04{:}09{.}006$  stuff so you know there's a lot of

NOTE Confidence: 0.7461756

 $01{:}04{:}09{.}006 \dashrightarrow 01{:}04{:}11{.}214$  different opportunities for treatment.

NOTE Confidence: 0.7461756

 $01{:}04{:}11{.}220 \dashrightarrow 01{:}04{:}14{.}880$  Unfortunately, and this is where.

NOTE Confidence: 0.7461756

01:04:14.880 --> 01:04:16.404 You know, institutional.

NOTE Confidence: 0.7461756

01:04:16.404 --> 01:04:18.944 I guess expertise comes in

NOTE Confidence: 0.7461756

 $01{:}04{:}18{.}944 \dashrightarrow 01{:}04{:}21{.}688$  is that there is no answer.

- 01:04:21.690 --> 01:04:24.504 OK, there really isn't, and you know,
- NOTE Confidence: 0.7461756
- 01:04:24.510 --> 01:04:27.324 I, as we've discussed in the past,
- NOTE Confidence: 0.7461756
- $01:04:27.330 \longrightarrow 01:04:29.983$  I personally believe taste is a great
- NOTE Confidence: 0.7461756
- 01:04:29.983 --> 01:04:32.568 option for portal vein tumor thrombus,
- NOTE Confidence: 0.7461756
- 01:04:32.570 --> 01:04:33.560 because you know,
- NOTE Confidence: 0.7461756
- $01{:}04{:}33{.}560 \dashrightarrow 01{:}04{:}36{.}574$  if you look at a lot of the
- NOTE Confidence: 0.7461756
- $01:04:36.574 \longrightarrow 01:04:37.810$  Asian publications,
- NOTE Confidence: 0.7461756
- $01:04:37.810 \longrightarrow 01:04:40.120$  you can see the actual apidel
- NOTE Confidence: 0.7461756
- $01{:}04{:}40{.}120 \dashrightarrow 01{:}04{:}42{.}650$  sitting in the portal vein codian.
- NOTE Confidence: 0.7461756
- 01:04:42.650 --> 01:04:45.205 OK, where it's very difficult
- NOTE Confidence: 0.7461756
- $01:04:45.205 \longrightarrow 01:04:47.760$  to see that with Y-90.
- NOTE Confidence: 0.7461756
- 01:04:47.760 --> 01:04:50.912 So I know that why 90 right now
- NOTE Confidence: 0.7461756
- $01:04:50.912 \longrightarrow 01:04:53.580$  seems to be the hot option.
- NOTE Confidence: 0.7461756
- 01:04:53.580 --> 01:04:55.660 Technically I used in figuratively
- NOTE Confidence: 0.7461756
- $01{:}04{:}55{.}660 \dashrightarrow 01{:}04{:}57{.}740$  for portal vein tumor thrombus,
- NOTE Confidence: 0.7461756
- $01:04:57.740 \longrightarrow 01:05:00.659$  but it's a very very delicate situation,

- NOTE Confidence: 0.7461756
- 01:05:00.660 --> 01:05:02.840 I mean.
- NOTE Confidence: 0.7461756
- 01:05:02.840 --> 01:05:04.996 I I don't really get too much
- NOTE Confidence: 0.7461756
- $01:05:04.996 \longrightarrow 01:05:06.440$  into the expensive at all,
- NOTE Confidence: 0.7461756
- $01{:}05{:}06{.}440 \dashrightarrow 01{:}05{:}08{.}540$  which we haven't even discussed at all,
- NOTE Confidence: 0.7461756
- $01{:}05{:}08.540 \dashrightarrow 01{:}05{:}09.960$  but.
- NOTE Confidence: 0.7461756
- 01:05:09.960 --> 01:05:11.922 A lot of it is just
- NOTE Confidence: 0.7461756
- $01{:}05{:}11.922 \dashrightarrow 01{:}05{:}12.576$  institutional northwestern.
- NOTE Confidence: 0.7461756
- 01:05:12.580 --> 01:05:14.458 I guess you would most likely
- NOTE Confidence: 0.7461756
- 01:05:14.458 --> 01:05:16.635 get away 90 even though I do
- NOTE Confidence: 0.7461756
- 01:05:16.635 --> 01:05:18.630 know they do taste so you know
- NOTE Confidence: 0.7461756
- $01{:}05{:}18.707 \dashrightarrow 01{:}05{:}20.747$  it's very difficult to choose.
- NOTE Confidence: 0.8266201
- $01{:}05{:}21{.}500 \dashrightarrow 01{:}05{:}25{.}110$  Alright, so if there are no no other
- NOTE Confidence: 0.8266201
- $01:05:25.110 \longrightarrow 01:05:27.810$  questions, I think we need we.
- NOTE Confidence: 0.8266201
- $01{:}05{:}27.810 \dashrightarrow 01{:}05{:}31.418$  We need to thank David Matter for this.
- NOTE Confidence: 0.8266201
- $01:05:31.420 \longrightarrow 01:05:34.350$  Very nice, informative in broad
- NOTE Confidence: 0.8266201

01:05:34.350 --> 01:05:38.314 lecture an and keep that in mind NOTE Confidence: 0.8266201 01:05:38.314 --> 01:05:41.569 when we have a patient with the. NOTE Confidence: 0.8266201 01:05:41.570 --> 01:05:43.670 Metastatic of primary liver cancer. NOTE Confidence: 0.8266201 01:05:43.670 --> 01:05:46.190 Thank you very much to all NOTE Confidence: 0.8266201 01:05:46.190 --> 01:05:48.290 and have a good evening. NOTE Confidence: 0.7994688

01:05:48.290 --> 01:05:52.210 Thanks Mary for the invitation.