YALE CANCER ANSWERS

Breast

# Reconstructive Techniques in Breast Cancer

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*Welcome to a series net casts brought to you by Yale University.*

*Thank you for joining us for this edition of Yale Cancer Answers where we provide you with up-to-date information on cancer care and research. Our host, Dr. Anees Chagpar, is Associate Professor of Surgical Oncology and Director of the Breast Center at Smilow Cancer Hospital. She interviews some of the nation's leading oncologists and cancer specialists who are on the forefront of the battle to fight cancer. If you are interested in past editions of Yale Cancer Answers, all of the shows are posted on the Yale Cancer Center website at YaleCancerCenter.org. If you would like to join the conversation, you can contact the doctors directly, the address is canceranswers@yale.edu. Here is Dr. Chagpar.*

Chagpar Welcome to another episode of Yale Cancer Answers. I am Dr. Anees Chagpar, and I am joined today by my guest Dr. Michael Alperovich. Dr. Alperovich is an Assistant Professor of Plastic Surgery and he is here with me today to talk about reconstructive techniques in breast cancer as this breast cancer awareness month. Thank you so much for joining me, Mike.

Alperovich Thanks for having me.

Chagpar Mike, let us talk a little bit about breast cancer surgery in general to begin with. I mean, when I see patients who have breast cancer, I generally give them the options of lumpectomy and mastectomy. And under the mastectomy category, people can either have immediate reconstruction or not. So, that immediate reconstruction is really where you come into play. Is that right?

Alperovich Like you said, patients have a choice whether they even want reconstruction at all since federal legislation has mandated in the late 1990s all patients are required to be offered and provided with reconstruction if they chose to have it. And for me, in terms of immediate reconstruction, the idea is that as soon as they have the mastectomy, we are in the operating room under the same operation and we help start the reconstructive process to get the patient back to a place where they are happy with how they look.

Chagpar Let us talk a little bit about the options that people have in terms of that immediate reconstruction, and I think just to kind of set the stage for everybody, when we talk about immediate reconstruction, you and I are often in the operating room together and really the surgical technique in terms of how we remove the breast is even a little bit different because we tend to leave the skin and just take out the nipple-areolar

complex, doing what we call as skin-sparing mastectomy. How does that affect your job as the reconstructive surgeon, is that helpful in the sense that you have that skin envelope?

Alperovich Certainly depending on what we decide, whether the patient wants to go with an implant or they want to have their own tissue using what we call an autologous reconstruction where we take a part of their tissue from their body and make a breast, and having that extra skin gives us a little bit more play in providing a more aesthetic result. We can expand the skin, we can borrow skin either from the belly or the thighs or the back to reconstruct that area or we can expand the skin with this implant, I can talk about that a little bit later, but the more skin you have, that is, the patient's own breast skin, the more natural appearing the result will be.

Chagpar We are providing this envelope and we are taking out the breast and the cancer that is in it, and you are really reconstructing that. You started to talk about different kinds of options, so let us go there. What are the different options? There is the implant and then there is this whole other big category called autologous. How do you help patients decide which is right for them?

Alperovich You hit it on the nose, in that sense, it is the patient's decision about what is right for them and they have to really figure that out after our discussion. I think what is unique about Yale is that we really do offer all of the options to the patient, so it is not that they have to pick one because that is all that is available, whatever is out there in cutting-edge reconstruction, it is provided here at Yale. The two main categories are implant reconstruction and using our own tissue or this autologous reconstruction. Implant involves placing a saline or silicone implant inside the old breast footprint that is leftover after the mastectomy, and the idea is that it is very similar to the implants that someone would have with an augmentation, but they are larger and slightly higher projection than what you would have because there is absolutely no breast tissue left. And that is certainly what I would say, is 80% of the reconstruction is done nationally. In terms of, if you parse it down even further, you can sometimes put an implant and just be done with one stage. I just published a paper in the plastic reconstructive surgery journal called *Breast in a Day*, and it is doing nipple-sparing mastectomy and immediate implants, and for these patients, about 70% of them, are done with one single stage, all done in the same operation. Other patients where we have to take the nipple-areolar complex or they need skin expanded, we place in something called the tissue expander, and it is basically a balloon, it is like an implant but it is empty and you come every week and we essentially fill it up with water and stretch out the skin to recruit the extra skin that is removed from the mastectomy, and that is really option #1 that is probably if you go around the country to most places, almost everyone will offer that. What we offer here is autologous tissue where we actually transfer tissue from a

part of your body where you have excess fat, and most women are happy to say well, you take my belly fat with me, take my thigh fat and we can actually create a cone of breast using your own tissue. The reason it is not offered in a lot of places is because it involves microsurgery. We take basically the vessels that supply that fat and we find vessels in your chest that match it to size, and these are 2- or 3-mm vessels at most. We use a microscope and suture the artery to the artery and the vein to the vein. The suture we use is 1/100th the size of a single-strand of hair, and we can basically take a piece of tissue from another part of your body and make it living to make a breast. And this is a great option for patients who really want to have their own tissue and a more natural result. It is a longer operation. It does create an extra scar on the body, but generally these patients feel like it is own their tissue. They gain weight, their breasts get bigger. If they lose weight, their breasts get smaller. It feels like the breast, it looks like a breast and a lot of patients really do seem to prefer that to an implant.

Chagpar Are there contraindications to one or the other? For example, if you have had a previous belly scar or a cesarean section are you more able or less able to have one or the other? What if you're too skinny, do these things play in or are there other factors aside from simply patient choice because I will tell you, there are a lot of patients out there who will say, if I can have a tummy tuck and have my breast reconstructed, even better.

Alperovich There are definitely patients that make it easier or harder to do it. So, if you do have scars, whether it is a C-section scar or other scars, it is almost never an issue. We can almost always operate on patients with a C-section scar. Even a midline scar, let us say they have a scar going up and down their belly, near the belly button, that is usually okay too. If they have an appendix scar or gallbladder scar, it is still usually doable. What I do for all these patients is I get a CAT scan before surgery, and I look at the blood vessels that supply that fat in their belly. And I use that as basically a roadmap, not only to tell me where the blood vessels are, but it also tells me, is this technically feasible? So, I do not exclude anyone based on scars alone, I will get a CAT scan just to see for myself. In terms of patients who, let us say, have a paucity of tissue, some women do not have a lot of fat in their belly, we can do something called the stacked DIEP flap and basically what that means is I use both sides of their belly to reconstruct one breast, and that is a way to get around patients who do not have a lot of belly fat, and then women who carry their weight let us say on their hips or their back side, we can use other flaps, less commonly used but things called the Pap flap or the S-cap flap, and this is using your upper back tissue or your lower thigh tissue to get that same result but in a sort of more giving area of the body for that patient.

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Chagpar What about other factors? What about smokers or diabetics or people who are obese? Do any of those factors play in?

Alperovich What I will say is, if you are obese, if you smoke, if you are diabetic, you are at higher risk of complications from both the mastectomy and any other surgery. Personally, I would rather have a flap of your own tissue that if the skin around your breast does not survive the surgery and some of it needs to get debrided or cleaned up, I would prefer to have your natural tissue underneath rather than having an implant. Because once the implant is exposed to the world, it is considered contaminated, we have to take it out. There has been a lot of data on whether smoking or diabetes or obesity impact the actual microsurgery, sewing those vessels together and it does not. It actually does not really increase the risk. The thing that it does increase is the risk of having healing complications in your breast, having healing complications on your belly or wherever you take the fat from and also having a higher risk of infection and some of that fat not taking, but overall, I do not exclude patients based on their weight or whether it is based on their smoking, I will refine how I do it. Maybe, I will be a little more conservative in my incision, have a little less tension on the closure, but those patients can still have a flap reconstruction.

Chagpar Note to all smokers, this does not mean that you can keep smoking, you should still try to quit smoking.

Alperovich The one thing I will say, it is hard to lose a lot of weight before surgery, to change your diabetes and get that under control, but smoking is the one thing that you can absolutely, if you can change that right before surgery, if you stop smoking for 4 weeks prior to surgery, your risk of complications is identical to someone who never smoked. So, it is one of these things that can drastically affect your recovery and how quickly you can get back in your life, and if you can stop in any way, I know it is asking a lot, but if you can stop smoking, it is the #1 thing you can do to give yourself a good result.

Chagpar Let's talk a little bit about radiation because a lot of people have heard about radiation and they think that if they need radiation afterwards, they cannot get reconstruction or if they have radiation, then they can never get reconstruction again, is that true?

Alperovich Absolutely not. Radiation has changed and radiation is different across institutions. It has also evolved over the past several decades. If you have radiation, there can be changes to your skin and it could create tight skin over your breast. So, for that reason, an implant may not be necessarily the best option. Statistically, about 30% of patients who have radiation therapy after an implant will fail reconstruction and that is something patients should be aware of. So, if it is possible and they are amenable to it,

using an autologous option using their own fat or their back muscle or their belly or their thighs, that is preferable for these patients. And radiation therapy certainly does a number on the skin, but flap reconstruction can either follow radiation therapy, it can precede therapy and these patients can absolutely still be reconstructed. Again, like I said, tools change, we may need recruit extra healthy skin from the back or the belly or the thigh, but these patients can still look well again and it just makes a little harder for us, but it is doable.

Chagpar We have talked a lot so far about kind of the skin-sparing mastectomy and one of the things you mentioned was a nipple-sparing mastectomy where we can keep the nipple with that skin flap. Now, I will tell you as a cancer doc, not everybody is eligible for that; when we can do it, in the appropriate patients, it looks beautiful, but in the not-appropriate patients, it really is something that we try to avoid, but if people are having a skin-sparing mastectomy and we take the nipple-areolar complex because all of the ducts of the breast go to the nipple and most cancers come from the ducts and when you are a cancer surgeon, you want to get rid of the cancer, but how do you reconstruct the nipple? Is that something that happens at the same time, does it happen later, is it a big surgery or a small surgery, an office procedure, tell us about nipple reconstruction.

Alperovich The goal is that whatever the first surgery is, the cancer surgery and the immediate reconstruction, that is the biggest operation. And everything that follows with what is less and less acute, meaning shorter hospital stay, you go home the same day, less pain. Nipple reconstruction is actually fairly painless to the point that I often will not even put the patients to sleep, I will have them awake for the surgery, I will ask them what music they like to listen to and we will play that on my sound system. Because once they get the mastectomy done or if they get a flap done, that skin has no feeling or sensation. So, these patients can tolerate a nipple reconstruction. The idea is basically taking your 2D, either breast skin or flap skin, and raising limbs and basically creating a 3D projection from a 2D surface. And I use that to make the nipple, and then in terms of the areola, there are multiple ways to do it. Often patients would just get a tattoo and there is actually a lot in the news of fairly well-known artists that will actually do areolar tattooing and made that sort of a side business from just treating these patients. And then, the other option is to take a skin graft from a part of the body where you have slightly darker skin, like your inner thigh and creating an areola from that.

Chagpar I think the other point which you made which was about the skin being insensate, I think that is another thing for the patients to keep in mind when they have a nipple-sparing mastectomy, is that nipple does not work, it does not feel, it does not respond to cold or sexual stimulus, it simply your own nipple, which looks very good, but I will

tell you that having seen what plastic surgeons can do with making nipples, they really are very good. But let us talk now about delayed reconstruction. Patients may have had to have a mastectomy and be flat, and either that is because they could not have reconstruction at the same time because of the tumor biology or because of where they were, does that mean that all doors are sealed to them. Does that mean that they can never have reconstruction in the future?

Alperovich Absolutely not. You are eligible for reconstruction at any point in your life as long as you can undergo and you are safe to have the surgery from a general health perspective. There is even data that patients who have advanced cancers, what we call stage IV cancer, often benefit psychologically from having breast reconstruction and that is done by many people around the country. I think if it is something you are interested in doing, it may take a little longer, there may be some scarring that we have to break up in order to restore that breast profile, that footprint. It is a lot easier obviously immediately, but it is something that can still be done. If you have not had radiation therapy, we can often place that same expander, that basically empty implant, and fill you up and stretch out the skin and still do an implant reconstruction. Or if you have radiation therapy and there is significant scarring, then we can still do a flap reconstruction and just borrow skin from another part of your body that is healthy, not contracted and can restore that breast shape which you expect to have.

Chagpar There are a lot of options in that post-mastectomy situation for reconstruction, whether it is after a conventional mastectomy where you are flat or with a skin-sparing or nipple-sparing mastectomy, where the plastic surgeon and oncologic surgeon work at the same time. But there is another concept that really plays into breast conserving surgery, and this is the whole concept of oncoplastics where the oncologic surgeon and the plastic surgeon work together to remove the cancer and create a better breast cosmetic outcome, and we frequently do this in people who need reductions. Can you talk a little bit about what this oncoplastic thing is, who is eligible for it, how exactly it works and what happens?

Alperovich If you go back 100 years to what Sir William Halsted did with radical mastectomies and we transitioned to just modified radical mastectomies, lumpectomies, breast conservation therapy, we have really had incredible advances obviously in the oncologic side of things, and I think since then, also the reconstructive aesthetic side has come into play and patients are really asking for as good an aesthetic results as possible because the treatments are so good that they can actually now focus a little bit more on the aesthetics of it as well. The idea is that once you do a lumpectomy and you take out a piece of tissue, if you just close the skin overlying it, you often have a contour irregularity, you can have sort of an unsightly scar over that area, and what we do is work with you and we essentially perform a reduction or a lift to try to fill in that

area with your breast tissue. So, I would do a breast reduction just like I would do for any other patient who did not have cancer except instead of removing the tissue for the breast reduction, you just remove it as part of the cancer. And then on the other side, that is unaffected, I will often do a symmetrizing lift just to get an aesthetic match in terms of nipple position and breast size. It is something that can be done in most cases. There are techniques that depend on where in the breast the cancer is located, the one sort of difficult area that is almost impossible to navigate would be if it is right below the nipple and areolar complex. In that sense, when we do a breast reduction, our principle goal is providing a pedicle which is a patch of blood supply or breast tissue to swing the nipple and areolar complex into a different position but keep it supplied at all times. If the area underneath the nipple and areolar complex is removed as part of the cancer, then the only thing supplying that nipple and areolar complex at that point is the skin attachments overlying it. And so, if I cut the skin attachments and there is no attachment from below and there is no attachment from the side, then I really cannot perform a reduction in those cases. However, the one option I still have at my disposal is called a local tissue rearrangement where I can take the underlying breast tissue and fill in the hole by rotating some tissue into that position, but often I would not be able to move the nipple-areolar complex at the same time.

Chagpar So, a great option in terms of oncoplastics for people who have large breasts, because in that circumstance, a lot of patients come to see me and they say, well I have always wanted to have a reduction and you should really talk to your breast cancer surgeon about that because very frequently your breast cancer surgeon can say, we can do that as a part of your oncologic surgery all at the same time. So, Mike, is the contralateral symmetry procedure covered by insurance?

Alperovich Everything related to the breast cancer diagnosis is covered by insurance. That includes the initial reconstruction, that includes symmetrizing procedures on the other side, that includes any revisionary surgeries, there is no lifetime limit on the number of surgeries you can have, there is no expiration date from your diagnosis of cancer. For the rest of your life, anything related to the breast cancer is covered. And that is one of the things I try to tell patients, this is something, for me, this is the best part of being a plastic surgeon in breast reconstruction, that oftentimes in a very difficult trying time in their life, this is the one positive thing that patients can look forward to. They can have more youthful-looking breasts, they can be bigger than they were before surgery and I have a chance to be able to give patients something that they are excited about in what is a very trying time, and for me that is a special privilege.

Chagpar That is really an important thing because sometimes you will have a lumpectomy and you will look great after your lumpectomy, and then you will have radiation and the scar will start to pull in, but oftentimes, you can fix that too, right?

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Alperovich Absolutely. You can fill it in with fat and we actually just published in the *Annals of Plastic Surgery* using adipose tissue, which is fat tissue and looking at what the risks are in terms of injecting fat into previous breast cancer sites, and so far, the data is it is not long-term data, but it seems to be safe on the whole, which is why we continue to do it. We can take belly fat or wherever you do not like fat, essentially doing liposuction. This is also covered by insurance, and we inject in small quantities the area of your breast that is deficient in volume. I can also release scar and do scar contracture rearrangements in order to help soften that area over time. And actually, the fat itself has adipose stem cells, which is basically stem cells that live in the fat and these stem cells are rejuvenating to the skin, so particularly for radiated tissue, if you have radiation therapy and you inject fat, there is great evidence that it will actually soften the scars up in addition to augmenting the volume.

Chagpar So, lots of options for patients having breast cancer who want not to look deformed, who want to face this diagnosis and at the same time have a great cosmetic outcome. What is on the horizon, last question Mike, in terms of new advances in breast reconstructive surgery?

Alperovich There are few things, from an aesthetic perspective, you mentioned nipple-sparing mastectomy, we are getting further and further out where we are now getting 5-year or 10-year follow-up data where we can actually start to show that it is safe oncologically with the right indications, and of course this is absolutely at the discretion of the breast surgeon, has to be safe first and foremost, we do not want to compromise the oncologic portion for a reconstructive outcome, but we are getting longer and longer term data that now we can start doing these breasts in a day operation where we can actually start using nipple-sparing mastectomy more frequently and expanding the indications. From reconstructive standpoint, we are constantly evolving new flaps that we use. So, initially there was really one option which was taking all from the belly muscle and swinging your belly fat and muscle into the breast. Now, we are actually able to detach the blood vessels and attach them to your chest, and now almost all my flaps, I do not take a single strand of muscle, I do not take a single strand of fascia and I just take the blood vessels with the fat which has been much less morbid for the patients, and from then, we are actually now finding more and more options where we can take fat from let us say the side of your thigh or your below your butt crease which is called the profunda artery perforator flap or we can take it from your upper butt area – basically the lower back. So, constantly evolving new flap options so that we can really offer this option to almost everyone. It may be a less commonly used flap, but they still have that option available. And then, I think finally just from an implant perspective, we are constantly swinging back and forth. Thirty years ago, everyone got an implant placed at the time of mastectomy, and there was a revolution in the 1980s, we started putting in these empty implants and

filling them with water to stretch out the skin. Now that we are doing more and more nipple-sparing mastectomies, we are doing more immediate implants at the time of mastectomy, which has shortened the recovery course of the patients and they have shortened their convalescence period. And I think if you look at some of the results that we are having, we are much more attuned to what women are thinking, and what I mean by that is, it is not okay to just look at a photo and say this is a good result or this is not a good result, and I really have to credit Dr. Andrea Pusic at Memorial Sloan Kettering for designing the Breast Q, and it is basically a questionnaire for women and it asks questions that are important to women – are you comfortable with clothes, are you comfortable naked, has your sexual intimacy changed, has your self-esteem changed, and we are actually using this data to better gear our reconstructions so we can do things for patients and say well, it is not enough to say that 10 plastic surgeons thought this was a good result, we actually need the patients to feel like they are having better result. And by studying these patients in aggregate and looking at thousands of patients, I think we are better addressing what the issues are for these patients, and I think just being more thoughtful to what the patients needs are has been a big advance in your specialty.

Chagpar That is really awesome. Lots of exciting things happening in breast reconstructive surgery. Mike, thank you so much for joining me today on Yale Cancer Answers. This was a wonderful discussion on reconstructive techniques in breast cancer in honor of breast cancer awareness month. This Dr. Anees Chagpar wishing everyone a healthy and happy tomorrow.

*This has been another edition of Yale Cancer Answers. We hope that you have learned something new and meaningful. If you have questions, go to YaleCancerCenter.org. for more information about cancer and the resources available to you. We hope that you will join us again for another discussion on the progress being made here and around the world in the fight against cancer.*