

SHRUTI TAINAN: I'm Shruti Tainan. For those of you who don't know me, I'm a plastic surgeon and reconstructive surgeon at Baptist. And I've been here for a year now. So today we're going to talk about updates in breast reconstruction surgery. It was nice, Ed, for you to do that in the beginning to let me know, or to let all of us know what our audience is. So this is going to be scientific, but at the same time going in and out so we can talk about things that are relevant, because a lot of us have personal and family experiences with this too.

And it's nice to be able to have an idea about things that we may not necessarily all do in our practice, but to be able to talk intelligently about it in our communities. I have no disclosures. So breast surgery has been in the news ever since I think Angelina Jolie catapulted it when she talked about her decision to do bilateral prophylactic mastectomy.

So since then, every now and then every six months or so there's another editorial. So this is, again, something highly relevant in the public discourse. We are not talking about this today. I've put this busy slide up here to show you there are so many different ways to approach the breast cancer patient.

And as we've learned all morning, everything is tailored. Everything is tailored to meet the specific needs of that patient, their genetic milieu, their physical needs, and their history, keeping in mind who they are as a person. So the same goes with reconstruction.

And today, our objectives today are really to talk about the challenges that we face from a reconstructive standpoint. What do we have science and data that tells us about what groups are going to be more challenging to reconstruct versus others? So what we found is that radiation really creates some challenges for us from a reconstructive standpoint. And so we have different ways of trying to combat that and trying to predict the problems we're going to have, and therefore change and adapt to that situation. So one of the things that's starting to come back is managing that radiated environment from a timing perspective. And we're going to go through a little bit as to why we do that, why we might talk about timing radiation during expansion versus after, the exchange in the permanent implant in certain patients.

And another thing is that acellular dermal matrix has really changed our aesthetic outcomes. So we'll talk a little bit about that and I'll show you some examples. We're going to talk about how we've been able to push limits in flap reconstruction and a nice adjunct for both implant

based or flat based reconstruction has been something called autologous fat grafting, which is I think a perfect solution. And we'll talk about why. But everyone has a little bit that we can take from somewhere and put somewhere useful. So no one seems to complain about that.

And the last thing I wanted to mention was obesity and how we have increasing data in our literature that suggests that these patients might be better served with an oncoplastic breast reconstruction reduction instead of going straight to mastectomy and two stage or multiple stage reconstruction. So that's our challenge. That's our American Ninja Warrior challenge is radiation, and how can we still have excellent reconstructive results in these patients.

So why do I say that? Why am I talking about this as a big problem for us? And so here's one example from University of Pennsylvania, which has really high volume of both autologous and implant-based reconstruction. What's interesting is about 25 years ago, most patients were getting radiation after their permanent implant. And the paradigm shifted to doing it during tissue expansion as radiation became much sooner after the mastectomy.

So previously, we would see there was a lot of capsular contracture, which means just like your body forms a scar on the skin, it forms a scar in and around the foreign body. It's just a foreign body reaction. And so that capsule gets tight. When you have a circle, it tightens in a circle and constricts over top of it. So that's what I mean by capsular contracture.

And what's interesting, if you look here, the major complications are a lot higher in our radiation to the tissue expander group. And just as a primer for those of you who aren't doing this on a day to day basis, our tissue expander group is-- it's that inflatable balloon that inflates over-- that we inflate manually over three to six months, and then we change that out for a silicone gel implant.

So we're talking about timing the radiation to either before or after that. So because the complication rate is requiring hospitalization and then implant exposure, rupture, or need to extrude it or take it out-- which we know that when you're reconstructive option fails it's like having a mastectomy all over again for our patients. Emotionally, it's devastating. So we really want to do everything we can to avoid it.

So this was-- Liza Wu and her group at UPenn was suggesting, hey, maybe we should consider in patients who are candidates for this doing radiation to their permanent implants. And as Dr. Brown said earlier today, you can get the stats to look any way you want. So I'm not really trying to tell you what to do. I'm just trying to tell a story that we're raising questions,

and we're finding different ways to treat our patients and their individual needs.

And so here's one example from Memorial Sloan-Kettering of different ways to time this in patients. But this is, again, something that requires a nice tumor board discussion where you sit down and say, all right. What's going to be oncologically responsible for this patient and at the same time allow us to get a good reconstruction as a secondary priority?

And one last thing before I shift gears and we talk about something else, this is why it's an issue. So when you look at this, it's one of those Kaplan Meier curves. I promise not to inundate you all with data here today-- so at six years this is implant survival, meaning if you're not at 100%, that's the percentage that has loss of their breast reconstruction, meaning we're having to take out the implant, usually for infection complications in areas that have been compromised.

So women who are having radiation during their expansion phase, 32% of those six years are losing their reconstruction, whereas women who are having radiation to their implant, so after the expansion has been exchanged for the silicone gel implant, at least at Memorial [? sloan-kettering ?] in their experience, they're losing those six years at 17%. So it's different. It's definitely something worth thinking about in the conversation if it's applicable. And then in contrast, women who don't have radiation at six years, only about 5% lose their implant for some reason or another.

So now I'm shifting gears to what are things that we're doing to try and help. And one of those is acellular dermal matrix. This has been-- and again, I have no disclosures. So these are just two examples. There are multiple.

But so what do I mean by EDM? What is that? So cadaver donated skin is then taken, and the dermis is separated at these various companies. And they have their own proprietary ways of processing these and sterilizing these, sometimes gamma radiation, sometimes chemicals.

But what that allows us to do is have an autologous-- or not autologous. Sorry-- an allograft type material. But it's still human derived. So it has that same tissue quality, tissue handling as human tissue, especially in these women that need just another layer. And the alternative, which is what we've always had and have been doing in the past is total sub-muscular coverage to protect these implants from the problems we mentioned of extrusion, infection, and things like that.

So this is just an example of where we would place the acellular dermal matrix. And that's really allowed us to decrease the number of operations as we're able to get a better aesthetic result. I put stars next to some of these things just because these are deviated in the literature. You can find papers that support one and find ones that support the other just depending upon your opinion.

However, since I'm standing at the podium, I can tell you my opinion. And that's been that these patients have been-- they're able to see a breast when they wake up. So they have their mastectomy-- because there's just not enough muscle tissue to place volume in the tissue expander at the initial time of the reconstruction then we do it in an immediate fashion.

And the impact on women to have that, to wake up knowing they had their mastectomy, but knowing that they have-- they call them they're prepubescent breast mounds, or whatever they always have their nicknames for, it's emotionally incredibly satisfying for these women. And so I have found in my practice that acellular dermal matrix really allows me to do that and to give them that.

And I feel better after having read multiple studies showing that it's cost effective. It's not like I'm just increasing cost by using another device. And this is something that's being used increasingly around the country and by plastic surgeons. So we're going to switch gears and talk about what the alternative is because I just told you 30% of women might be losing their device, their implants. So what are our options?

And so in some of those situations in select patients, autologous tissue is what we utilize. So what does that mean, exactly? That means that we take tissue from somewhere else and hook it up to the blood vessels in and around the breast. So that usually means the internal mammary arteries underneath the ribs. So we have to take out a small portion of the rib to take the tissue.

And if it's a free flap we take it-- oh, I'm going in the wrong direction. Sorry. If it's a free flap from the abdomen, we're taking the deep inferior epigastric artery system coming off, the external iliac enphemerals, and taking it with the abdominal tissue, and recreating a breast mound. I'll show you that on the next slide.

Alternatively, we can use the latissimus muscle. And you can imagine these have what's called donor site morbidity where we're taking tissue from somewhere else and robbing Peter to pay Paul so to speak. And if they're not candidates for this, there's also a third option. You really

can take tissue from anywhere in the body if you know it's a blood vessel and you can isolate it. However, we keep in mind what makes sense, what's most appropriate, what tissue best recapitulates the native breast.

And here's something else that we're doing. We have a few of these coming up wherein women who don't have enough tissue from one half of their abdomen to make another breast will take the entire. And this is the same. This is like-- in an oversimplification, this is sort of the same tissue that's removed with what's called a tummy tuck or an abdominal plasty, the difference being that we have to go down through the muscles to get the blood vessels that keep it alive and then plug them in to the memory to recreate a breast mound.

And you can see. In plastic surgery, we get to think about the stuff that nobody else has to bother with. But it's so much fun. How am I going to make this and shape this into a breast that's going to match her other side? That's what we get to think about. It's phenomenal. I love my job, as a side note.

So as we think about this, nothing is a panacea, neither implants nor flaps. And like I talked about, our challenge is in an increasing group of radiated patients, we need to make sure that we counsel them appropriately. We prepare them for the potential outcomes and a couple of bumps they might have in the road.

And not surprisingly, in flap reconstruction, the main issue is just wound dehiscence, delayed healing, often at the margin of the radiated skin and the flap. But that's usually something that can be managed. We're not talking about reconstructive failure nearly as often in the autologous, meaning flap, as we are in this device-based reconstruction. And this is actually a multi-center trial from out at USC.

So again, the same thing [INAUDIBLE] talking about, the fat necrosis and wound infection. Another thing that's a complication that's more relevant to the surgeon than it is to the patient is that it takes a toll. We're having to do a lot of vascular revisions in the middle of surgery because we're operating on these blood vessels under the microscope, putting it back together. And they're friable if they've been radiated as compared to not. But we're usually not having higher rates of flap loss.

They're pretty comparable. So we're usually able to salvage the flap. But it does add to our stress level in the operating room. So what do we do? This autologous fat grafting I think is such a wonderful adjunct for our patients because-- and we're still transferring to understand

why that is.

So it allows us to feather the transition or smooth in the transition from the reconstructive breast to the chest wall. And the breast surgeons in the room know that they're having to take that breast gland off the pack. So once that's all scooped out, really it's just chest. It's the pectorals muscle, and the chest, and the shape.

So once you place an implant there's this hollow, or once you place a flap there's still that hollow. So now taking that reconstruction to the next level, and really pushing it, and trying to get the most natural looking breast, but at the same time change some of the quality of that radiated skin, we don't know why it is. We presume it's because of the stem cells that are in the fat. We're studying it actively now here at Wake Forest and at many institutions, trying to understand why is it that when we take fat from the abdomen as you see up here, it's literally similar to-- not exactly the same-- but similar to the way we do it for liposuction.

We spin it down, and we get rid of any debris, and we inject the fat very intentionally into areas that need it, areas that have hollows, or areas that have radiation damaged skin. And we're finding that it creates youthful skin. This also has aesthetic applications. At the time of face lift we're injecting it and noticing that the rhytids or wrinkles are actually effaced.

And it's not something we're able to do as predictably as we'd like, which is why we're studying it, so we can modulate it better. It's a very interesting topic and interesting field, at least it is to me. So now I wanted to move on and just talk briefly about another challenge for us, especially in North Carolina as we're taking care of more and more obese patients.

And so is there something we should be doing differently in these folks? And I ask that myself. And this I thought was very fascinating. This is just one little paragraph from Patrick Garveys paper out at M.D. Anderson.

And what he found-- he writes it a little interesting in terms of less likely. But I think the best way to think about it is women, when they're obese, or having less complications that are requiring further surgery, if they're having oncoplastic breast reductions and reconstructions, than if they're having mastectomy and either implant-based reconstruction or not-- granted, obviously this isn't people who are candidates for this as an option.

But this is a busy slide. I apologize. But there is a point here. And so in terms of complications, delaying agilent therapy. IBR is implant-- I'm sorry-- immediate breast reconstruction. So that's

basically expander-based. We're putting tissue expanders in at the time of the reconstruction. And OBR is oncoplastic breast reconstruction, which essentially involves doing a breast reduction after the breast surgeon does the lumpectomy.

And so when you look here, complications delaying agilent therapy, this is 14% versus 1%. It's amazing. And so a lot of these problems that they're having reconstructive failures, infections-- infections, 40%-- delayed wound healing. And this is not people who are radiated. This is the only issue is obesity.

And what's interesting is that the BMI was actually lower in their immediate breast reconstruction group than their oncoplastic breast reconstruction group, not by much. But anyway, I don't want to belabor the point. But it's something interesting to think about for future, for another way to target how we might treat this population a little differently to improve their outcomes.

So looking at all this information, I get asked, and I'm sure a lot of you in this room get asked, well, what would you do if it was you? Well, my answer is always, it depends and I'm not you. But let's try and figure out what your priorities are in life so we can make the best decision together for you. But I still wanted to know.

And so I surveyed plastic surgeons in the American Society of Plastic Surgeons database. So there's 6,000 of us and trainees. And I stratified it into women-- there are 800 women plastic surgeons-- and men just to see what would they do if it was themselves. And for the men, they'd have to think, OK. Well, what if it was my loved one? What would I recommend and why?

And what's interesting is we found-- so the red is the implant-based reconstruction. The blue is the autologous, meaning I take tissue from somewhere and take it and put it somewhere else, which has donor site morbidity and has a longer hospitalization, about a week upfront. So we found that--sorry. We found that women were more likely to want implant-based reconstruction.

And we found that with increasing age, there was a small subgroup of women as they went toward middle age that wanted autologous tissue. It wasn't really powered for statistical significance. Unfortunately we don't have enough women plastic surgeons to do that just yet. But maybe soon.

And then when we looked at what the men, what their preferences were-- this was so interesting. So as men had increasing age who were answering the survey, they had increasing preference for implant-based reconstruction and decreasing preference for autologous, abdominal flap-based reconstruction. That was pretty fascinating.

And so the way we designed the survey-- so I said, all right. I allowed them to pick multiple reasons. So what were my top three? So for those who said I want implant-based reconstruction, men and women, what were your top three reasons for choosing that?

Recovery time-- so you get to see the priorities of the patient, the recovery time, the hospital length of stay, and then aesthetic appearance of the final result was at 40%. Donor site weakness, meaning hernia and bulge from when we take your abdominal tissue, that was on their mind just as much as the aesthetic final appearance.

So this is very consistent with other studies of people who are-- when you're asking surgeons about going through surgery, they're going to pick the option that let's them get back to 18 hour days and get back to being in the operating room and on their feet. Of course, they need to be out of the hospital so they can get back to work.

So that's not that surprising. And then people who are selecting autologous abdominal flat-based reconstruction for themselves or for their loved ones found that the reason they were really doing it was for the longevity and result because it is much more long lasting and natural appearing breast. And the aesthetic appearance, 80% and preference for autologous tissue, here you can see foreign body, so worrying about having silicone or whatever is about 30%.

There's nothing, not even in the top five anywhere about being worried about implant-based complications or anything like that. Very interesting. So that was-- I thought I had one more slide. Oh, we have questions.

So that's my summary statement on where things are going, where our science is headed. We still have a lot of work to do. There's so much room to improve for our patients, and we constantly need to ask more. But thank you.

[APPLAUSE]