Quick Fire Surgical Pearls to Optimize Patient Outcomes

Swati Kannan, MD, FAAD, interviewed by Hillary Johnson-Jahangir, MD, PhD, FAAD

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Good day, everyone. I am Hillary Johnson-Jahangir. And I'm so pleased to be here with Dr. Swati Kannan. She is Clinical Assistant Professor and fellowship-trained Mohs surgeon, practicing at University of California in San Diego, specializing in surgery and aesthetics. Dr. Kannan also has a special interest in skin of color patient care and optimizing patient outcomes. And that will be our topic today. We're going to talk about some key surgical pearls for optimizing our surgical outcomes, something that dermatologic surgeons tend to take the lead in. Let's get us started. What are your top outcomes that you're looking to influence in the course of your work?

SWATI KANNAN, MD, FAAD: First of all, thank you so much for having me. This is such a pleasure. When we're looking at surgical outcomes, the biggest outcome is, of course, clearance of whatever we're excising. So that we're just going to say is guaranteed, because if it's not clear we're going to reexcise. But the outcomes that patients are also looking for, the first outcome is scar, so how much of a scar is there going to be. And then infection and hematomas are the secondary outcomes that we also measure that we want to minimize.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Those are very well stated as some top concerns, especially scar management is a challenge for us all. I'm curious, how do you approach that? Say you have a patient with a lesion on the face and a little bit higher risk for scarring. How do you think about preparing for surgery and what strategies do you recommend after surgery?

SWATI KANNAN, MD, FAAD: The most important thing is, of course, patient counseling. So I tell my younger patients they're actually going to have a higher risk of scarring than my older patients, which is ironic because younger people tend to heal better technically. But the reason

they have a higher risk of scar formation is because their skin is thicker, their skin is tighter. Even if we do the best surgical technique to bring that wound close together, they're going to have a higher risk of scar, so that's just important when we counsel our patients.—

--Skin of color, Asian patients, Hispanic patients, I see a lot of that population in San Diego here, they're also going to scar worse, so patient counseling is, of course, very important. When it comes to the surgical technique, I vary my techniques between skin of color patients and Caucasian patients. So, for example, on a Caucasian patient who is older, I am perfectly okay using absorbable top sutures on the face, because I don't want them to have to come back in for suture removal and people don't really like seeing doctors anymore anyway, so I want them to have an easier postoperative care.—

--Whereas for skin of color and younger patients, I always will put top sutures that need to come out. Those will usually come out on the face in five to seven days. There is actually a study done in skin of color patients between using absorbable sutures and nonabsorbable sutures and nonabsorbable sutures fared better, because there's less inflammation.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Thank you for that pearl, that is a good one for us all to keep in mind, the top stitches do matter. What about wound care, do you have any recommendations for your patients to follow?

SWATI KANNAN, MD, FAAD: The wound care is the same for almost all of our patients, unless we do glue. Let me kind of go back. I know we talked about the face earlier. For the body, I actually don't like to put top stitches, we put buried subcuticular stitches with a dissolving Monocryl mainly or monofilament. And then I will put glue on all of those patients so they don't have any wound care and they don't need to come back. When we don't put stitches on top on the body or trunk, they don't get track marks so that inherently looks a lot better.—

--So if they have glue on, there is no wound care. They take off the dressing in two days and they're home free. Whereas for patients that we do have to take out the top stitches, the wound care is the same. We actually ask them to clean it with dilute white vinegar. Most of our patients love that and I tell them you can use it for your counters and your skin. It's very gentle, it doesn't kill the good cells. After that, they will apply ointment, whether it's Vaseline or Aquaphor. All of us dermatologists, we don't like Neosporin anyway, and then they'll put a dressing on top.—

--So they'll do that for about two weeks. We have seen some really great outcomes from that, it's a pretty simple wound care for them to follow. If they can keep it clean, moist, and covered, that is the best.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: I also notice dilute vinegar is fantastic and I use it on my counters and with my patients, as well. I think it's one of those nice, natural, nonchemical, low risk, yet proven antimicrobial approaches. So that's a wonderful pearl to share, as well. Some of our patients are extra-motivated and want to do more. Like after they're done with the initial wound healing phase, are there extra things that the motivated patient can do to optimize their scar outcome?

SWATI KANNAN, MD, FAAD: For sure. So there is something patients can do and then something physicians can do, as well. So what I ask the patients to do is get silicone scar strips or silicone scar gel. They can get this from pharmacy stores or mainly from Amazon, there's multiple different brands that make it. I prefer silicone scar strips or gel that are 100 percent silicone. We don't know exactly how it works but we think that the silicone tricks the stratum corneum into thinking that there's no wound.—

--So therefore, the collagen that you make is the good collagen, the more type 1 collagen, versus the bad collagen which is the type 3 collagen. At the two week mark for all of my patients, whether they've had surgeries on the face or on the trunk or extremities, the two week

mark is when they will start their silicone scar strips. I prefer the strips over the gel because a strip provides occlusion, which in my mind is better for the silicone to be able to penetrate where we want it to go. But they'll start that at two weeks and I ask them to use it every single day, at least for one month, but ideally for three months.—

--And then again, counseling is really important. We have to talk to them about the strength of the wound is very low at the two week mark and then it only goes up, so they need to continue doing their silicone scar strips and gel for optimal scar outcomes. From the surgeon's standpoint, if you have access to devices, it's helpful. If you don't have access to devices, that's okay too. But we have studies that show that if we can do a fractional laser at the suture removal point, so whether that's one week or two weeks, that's going to substantially minimize the scar from forming.—

--For a lot of my cosmetically-sensitive patients, I will ask them to come back on the day of their suture removal and I will simply laser them. That in itself is very helpful to minimize the scar from forming.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Are there any other considerations that might push you to doing early laser therapy, beyond just your sense of the patient's motivation and anxiety?

SWATI KANNAN, MD, FAAD: For sure. So if the patient does have a risk of keloids, hypertrophic scars, I will urge them to come back in earlier for laser scarring prior to the formation of the scar, so at the suture removal point. We can also inject triamcinolone. Usually I start triamcinolone 10 mg/mL but I will inject that on the day of surgery, especially if the lesion is on the trunk, chest. Right after the wound is closed, I will put triamcinolone 10 mg/mL, I will inject it into the incision line.—

--They will come back a week later for another injection, a week after that, and then every month until we make sure that there is no keloid that will form. There is some concern that this will impair wound healing. That's why I don't inject too much Kenalog but it's just enough to make sure that they don't have excessive scar formation.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: I haven't tried that before, I think I will next time. Thank you for that pearl. You mentioned using devices early in the process. Now, does this practice vary for your skin of color population? You live in California, so device use has extra-special risk of postinflammatory pigment change. How do you manage that?

SWATI KANNAN, MD, FAAD: Everyone here has a risk of discoloration, I would say even some of my Caucasian patients who technically should be skin type II but they behave like they're skin type IV. So a few tips for those patients. I will laser the scar at suture removal for all patients, even if they're skin of color, it's just that my settings will vary. So of course for my skin of color patients, I'm going to do much more conservative settings and do low density. This is referring to mainly fractional, nonablative or fractional ablative laser, so that's what I use at suture removal.—

--Once the surgery has healed, sun protection is really important. That's why the silicone scar strip is also important at the two week mark. If they can do it 24/7, then that's also helpful because it will protect that wound from sun exposure and, of course, sunscreen. Especially for skin of color patients, it's not just important to protect against UV light, they also need to protect against visible light. So tinted sunscreen is what I recommend, since tinted sunscreen has iron oxide to help protect against the visible light, which can also cause discoloration.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: That is such an important thing to keep in mind, because tinted sunscreen thankfully is becoming more and more available and seems to

be a better formulation access, where it's not so difficult to use anymore. Do you recommend pretty much then everybody use tinted sunscreen after surgery?

SWATI KANNAN, MD, FAAD: I think everyone should use tinted sunscreen after surgery. Of course, that's not as important for our skin types I and II, who tend to heal more pink and red. Sunscreen is still important for them but the tint isn't as important. But for most of my patients, especially since I live out in California, tinted sunscreen is very important. One pro tip is if you can't find a tint that works for your skin, you can actually mix a little bit of foundation with the sunscreen and that way, it will just blend in a little bit better.—

--And foundation also has iron oxide to give it that brown color and so you just need a little bit of iron oxide to help protect against visible light.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Is there anything else about scar management that you would like our listeners to know?

SWATI KANNAN, MD, FAAD: I think with skin of color, counseling is very important. The other two techniques that you can use is topical tranexamic acid or intraincisional tranexamic acid. Tranexamic acid is something that we've been using a lot, especially for the management of melasma. It hasn't been studied as much in postinflammatory hyperpigmentation but anecdotally, I have found it to be very helpful. So for example, you can mix a little bit of tranexamic acid into your lidocaine mixture, about 1:10 ratio.—

--That will also help with any hematoma minimization, because it helps clot the blood and so it helps with minimizing your hematoma risk. But I have also found it to help minimize a little bit of discoloration in our skin of color patients. If I am doing laser on skin of color patients at suture removal, I apply topical tranexamic acid almost as drug delivery and that will go into the channels that I've created from the laser, to help then minimize the risk of discoloration. So

tranexamic acid is something that we can easily get, it's affordable, and you just get the IV liquid version, and it's very easy to use.—

--The other tip I have is if you're doing skin cancer surgeries on the face in a skin type III to VI, you want to obviously optimize your surgical technique but you also want to make sure you don't do anything too complex. The more complex or curved the line in skin of color, the more visible it will be. So the simpler repair that hides within the subunits of that area will be much more beneficial for the skin of color patients. And of course for all patients, but especially for skin of color patients.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: My key takeaways so far include use of silicone strips, consider early intervention rather than later with fractional resurfacing devices, and I'm so excited to hear about these innovative uses of topical and intralesional tranexamic acid. Earlier, we talked about some additional outcomes that were really important, more in the lines of minimizing complications. Can you tell us more?

SWATI KANNAN, MD, FAAD: The two main complications of surgeries are hematoma or infection. The infection risk varies based on the location. Face and scalp are the lowest, because we have the most blood flow. And then as we move away from our heart, the infection risk increases. A few tips to help minimize those risks is using surgical adhesive, so surgical glue. That's why I use it so often in my practice. So for example, on the lower extremities where we have an infection risk of 5 to 15 percent, depending on what studies you look at, one of the things that we do in our practice is after we put the buried subcuticular stitches, we will clean that area again with some sort of disinfectant, whether it's chlorhexidine or iodine, whatever you use in your practice, and then I will put one or two layers of surgical adhesive on top.—

--We are doing this study at UCSC, we're about to publish it, but basically it has decreased the risk of infections significantly by using surgical adhesive. You can also use surgical adhesive in

the groin area or inframammary area, where these are areas where you do get a higher risk of infections, so it will just help provide a good seal to then minimize risk of infection and patients don't have to do wound care. One of the biggest sources of infection is patient wound care, they are not able to do it properly.—

--I have had patients use toilet paper on their wound. I have had patients use their dog's washcloth on their wound and have infections from really weird bacteria. So surgical glue will help minimize wound care and will help minimize the risk of infections.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: I have noticed the exact same trend in my own practice. Several years ago, I switched to exclusive use of cyanoacrylate-based adhesives for the top closure and the infection complication rate practically went to zero. I would always culture the wound in the past when I used stitches and, by and large, the organisms that grew were related to the bowel, which hinted at the same issue with lack of hand hygiene and wound care that's a major driver.—

--That is another big innovation that I think we can all learn from. Earlier you mentioned hematomas can be a big risk and impact our surgical outcomes. What do you recommend we consider adding to our practice to help with that?

SWATI KANNAN, MD, FAAD: Hematomas are, of course, going to be a higher risk in patients who take blood thinners, so preoperative counseling is very important. For our practice, we make sure that the pressure dressing is on really nicely. In all honesty, it is the pressure dressing that makes a really big impact with the first 48 hours after surgery. So if we have a new nurse for example, I will watch them like a hawk, make sure that the pressure dressing is on properly.—

--For extremities, we like to use Ace wraps. That way if it's too tight, the patient can unwrap it and rewrap it, but that way there's enough pressure to help minimize the hematoma formation. There is some anecdotal evidence that using intraincisional tranexamic acid, meaning you mix it with your lidocaine in the 1:10 ratio, like I talked about earlier. That possibly helps to decrease the risk of hematomas, especially in patients who are on blood thinners.—

--I think that this is something that we need to still verify. It doesn't have a lot of publications or evidence to support it yet, but it is something that you can consider in some patients. You also have to be careful though with using tranexamic acid intraincisionally because a lot of patients who are on blood thinners, they're on blood thinners to help prevent blood clots. So you just have to make sure that whoever you're using it on that you have clearance from their primary care doctor or cardiologist.—

--We don't use tranexamic acid intraincisionally that often because of this one reason. The main thing that we do is to make sure that the patient has a really good pressure dressing on. I also teach fellows and residents, so when they're doing surgeries on patients I ask them to decrease the dead space as much as possible. So that means that if you're putting your deep stitches in, make sure you do a three or four-point stitch where you grab the depth into your deep stitch, so that you minimize that dead space where hematomas can possibly form.—

--The last tip is to obviously put a surgical drain. Even if you're doing a linear closure, especially on the abdomen, there is a higher risk of hematoma. So just putting a drain in is very helpful.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: Do you think patient factors play a role, as well? Do you find patients who are intent on going rollerblading after surgery are more at risk for a bleeding hematoma? What do you advise patients with respect to exercise?

SWATI KANNAN, MD, FAAD: This is something that I constantly get pushback on by our San Diego active patients. We tell them absolutely no activities for two weeks. Exercise obviously plays a really big role in postoperative bleeding. So they are told that they can only go for ten minute walks but nothing more than that for the first two weeks after their surgery. Most of the patients, once I scare them enough, they follow those instructions. But yes, exercise plays a really big role. We want to make sure that the heart rate and the blood pressure do not go up significantly after surgery.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: What are your final key pearls for our listeners in summary?

SWATI KANNAN, MD, FAAD: The first key pearl is implement the use of silicone scar strips and gel in your practice. It plays a really big role in minimizing the risk of hypertrophic and erythematous scars. Second pearl is to, for cosmetically-sensitive patients, make sure that if you have a device or even if you just have microneedling or something small, to do some sort of early intervention to help minimize the risk of scar at suture removal.—

--The third tip is counseling is very important. Remember that younger patients and skin of color patients will have worse scars. So let them know ahead of time and give them tips to minimize that and the patients will be very appreciative.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: That was amazing. I can't thank you enough for this time. It's so informative and these pearls are going to really improve the outcomes of our patients.

SWATI KANNAN, MD, FAAD: Thank you so much for having me, it was such a pleasure.

HILLARY JOHNSON-JAHANGIR, MD, PhD, FAAD: This has been Dr. Hillary Johnson with Dr. Swati Kannan. We are so appreciative of your pearls today. It's going to be important for our outcomes.

Commentary

Lauryn Reid, MD with Benjamin Stoff, MD, FAAD (ed.)

Although dermatologic surgery is associated with a relatively low risk of complications there is always room for improvement. Factors such as patient age, Fitzpatrick skin type, personal history of hypertrophic or keloid scarring, and anatomic location should be taken into consideration. Use of appropriate suture, wound care routine, lasers, and intralesional injections, as well patient education can all improve outcomes. In this Dialogues in Dermatology, Dr. Hillary Johnson-Jahangir interviews Dr. Swati Kannan about quick fire pearls to improve surgical outcomes.

A few pearls from this episode include:

1. Consideration of the location and suture type is important. While absorbable epidermal sutures are convenient for some patients, such as those who are older and have Fitzpatrick I-II skin, they are problematic for others because of a tendency to induce inflammation. Although further research is necessary, studies have found that nylon and Prolene epidermal sutures are preferred in skin of color[1]. Additionally, the use of surgical adhesives can mitigate cosmetic problems related to epidermal sutures.
2. Patients should be advised to keep pressure dressings intact for approximately 48 hours to reduce post-operative bleeding. Furthermore, instructing patients to wash the wound daily with soap and water followed by Vaseline application can improve outcomes. In areas that are at higher risk for infection such as the lower extremities or skin folds, using surgical adhesive can further reduce risk of infection[2].
3. Scar appearance can be improved using a variety of techniques including intra-incisional corticosteroid injections, lasers, and silicone. Corticosteroid can be injected along the incision on the day of surgery and continued at routine intervals for patients with a tendency for hypertrophic scars or keloids. Upon suture removal, the incision can be treated with a resurfacing laser. The settings must vary based on skin type. Additionally, patients who prefer at home therapies can try topical silicone to prevent scar formation and improve scar appearance.
4. Although all skin types can experience pigmentary changes after procedures, patients with higher Fitzpatrick skin types are at greater risk for post-inflammatory hyperpigmentation. A relatively new option to explore with these patients is topical or injectable tranexamic acid (TXA).[5]

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