Minimally Invasive Foot & Ankle Surgery at Penn Orthopaedics

Host: Welcome to the podcast series from the specialists at Penn Medicine. I'm Melanie Cole. And joining me today is Bobby Ndu, MD. He's an Orthopaedic Foot and Ankle Fellowship Director and Assistant Professor of Clinical Orthopaedic Surgery at Penn Medicine. He's here to highlight minimally invasive foot and ankle surgery.

Dr. Ndu, thank you so much for being with us today. Tell us a little bit about yourself. And what we'll be discussing here today.

Bobby Ndu, MD: Sure. So today, we're going to be discussing minimally invasive foot and ankle reconstruction surgery.

And a little bit of background on me and sort of how I got involved in this was I was actually a fellow here at Penn many years ago in 2012 to '13. And I've been in practice at another institution in Philadelphia for the past seven to eight years and was recently recruited back to Penn to serve in this role as the Fellowship Director for the Orthopaedic Foot and Ankle Division.

And through that, started getting involved in our MIS program, or in minimally invasive surgery in general and wanted to bring that here to Penn as an augment to the great number of opportunities that we provide for our patients as something that we can do to help facilitate their care and make it easier and more pain-free whenever we possibly can.

So my role has now evolved into being the leader for our MIS Development Program here for the Orthopaedic Foot and Ankle Section.

How does minimally invasive foot and ankle surgery differ from traditional foot and ankle surgery?

Host: Thank you so much for sharing that. So let's speak about minimally invasive foot and ankle surgery. How does it differ, doctor, from traditional foot and ankle surgery? Tell us a little bit about the evolution and the improvements that make these procedures possible.

Bobby Ndu, MD: So typical foot and ankle surgery usually involves a complex array of procedures to accomplish a goal because the foot and ankle is quite a complex structure. It's very rare that you're doing just one thing. One move usually affects several other joints or several other bones. And thus, you have to take all of these things into consideration.

Along with that is that a lot of the patients we deal with for foot and ankle surgery tend to be diabetics or have a multitude of other health co-morbidities that can really affect their ability to heal. So minimally invasive surgery allows us to accomplish some of the same corrections that we used to do in an open fashion, such as bunions or hammertoes, or even sometimes enlarged forefoot and hindfoot reconstruction procedures.

But now, I'm doing them through keyhole incisions that are about the size of a fingernail. Having that smaller incision allows for less soft tissue dissection, which then leads to faster healing for patients with less pain and less wound complications, especially in our diabetic patients and those patients who have trouble quitting smoking. So this opens up an array of opportunities to help these patients with significantly less risk.

So this was developed by several French orthopaedic surgeons who started doing MIS because they were facing some of the same challenges that we were with our diabetic patient population, and some of the wound complications that they were having from slow healing. They found that by using these minimally invasive techniques, they were able to avoid a lot of those complications while still providing top quality care to these patients.

And one of the technology advancements that was made that really has opened up the door here for this was the development of high-torque, low-speed burrs that we can use to make our bony cuts and our realignments all under fluoroscopic imaging through a tiny incision that's just big enough to fit the burr. But because the burr is moving with high torque and low speed, then it's safe for the surrounding soft tissues and does not cause soft tissue damage like it would if it were a high-speed burr.

So that advancement alone opened the door to allow us to start being able to do this. And we're learning new and additional procedures that we can do through MIS or as an augment to our larger open procedures to allow for less incisions and faster recovery. So this is a really exciting time for us to be on the cutting edge of what is the future of orthopaedic foot and ankle surgery.

Host: So now the procedure itself. I understand there's a bit of a learning curve. Are there any technical considerations you'd like to share with other providers, Dr. Ndu, to help achieve better outcomes?

Bobby Ndu, MD: Oh, there's definitely a significant learning curve to performing minimally invasive surgery, because it changes your ability to do this surgery under direct visualization and you're now doing a significant portion of it under tactile reception, as opposed to a visual feedback.

So it's more based on what you're feeling happening under the skin and what you're doing under fluoro, as opposed to you being able to look at it directly.

There is a very steep learning curve and to help overcome that, anyone who was interested in training on MIS should be doing a multitude of cadaver labs prior to proceeding with surgery on a live patient to ensure that you have seen multiple anatomic variations as well as how to get yourself out of any particular trouble.

Now, before we did our very first case here at Penn for MIS reconstructive surgery, I've been training on it for well over a year, with a multitude of cadaver labs and technique labs, to make sure that the skill set that my team was bringing to the patient would be the very best possible. So this is not something that anyone can just dabble in or can just pick up and do. It should be done by someone who is well trained in it.

And quite frankly, in our current Philadelphia area, there are not many, if any, other foot and ankle surgeons doing this extensively. So right now Penn has the most extensive program of MIS forefoot, hindfoot, midfoot reconstruction in the area.

Who is a candidate for minimally invasive surgery of the foot and ankle?

Host: Let's talk about patient selection, Dr. Ndu. What makes someone a great candidate for minimally invasive foot and ankle surgery? Are there conditions or circumstances that would prevent someone from having surgery in this way?

Bobby Ndu, MD: So doing MIS surgery actually opens up the opportunity for a multitude of patients. As you mentioned, those ones who are previously poor candidates because of a history of smoking. Now, the smoking history can still affect healing in the long-term, but we can decrease their soft tissue complication rate by doing this in an MIS fashion. And the same is true for patients who are diabetics.

And one area where doing the minimally invasive surgery can be particularly helpful is in patients who tend to form significant and large amounts of scar tissue, such as patients who are prone to keloid.

Those are the guys who would absolutely benefit from this in regards to keeping their scar as small as possible, which decreases their stiffness and all sorts of other sequelae from the surgery post-op. So this opens up the candidacy for those patients, while our standard non-smoker, non-diabetic, otherwise healthy patient is also an excellent candidate for this.

The one area where I would caution anyone about just going straight to MIS would be making sure that even though we have this tool, it should still be used judiciously and that surgery should be still a last resort. I would still recommend that any patient exhaust their non-operative options first before we begin to consider the surgical options. So anyone who has not exhausted non-operative options to me would be contraindicated to proceed with MIS surgery.

Host: Tell us a little bit about when you feel that physicians should refer their foot and ankle patients to you for minimally invasive surgery.

Bobby Ndu, MD: Patients should be referred to us for consideration as surgical candidates once they've exhausted those non-operative options I mentioned. Have they used orthotics? Have they done physical therapy? Have they exhausted their bracing possibilities?

And if those things are done, then they should be coming in to have a conversation about surgery and what it can mean for them.

And one of the things that I truly share with my patients is when you've arrived at the point that you are adjusting your life for your foot, then it comes time to adjust your foot for your life.

So, meaning, if you're making decisions about life, such as "I'm not going to go to the graduation party," or "I'm not going to go to the wedding because my foot is bothering me," that means that now this is truly starting to affect your quality of life.

And so, it's time then to start really considering some of the stronger options beyond bracing and orthotics, and to consider surgery as a distinct possibility.

If you are a surgical candidate, then you might be an MIS surgical candidate. And that would be a decision made based on the conversation between myself and the patient, the patient's desires as well as that patient's medical comorbidities.

If a patient has a significant laundry list of problems, they're probably not a good surgical candidate to begin with and perhaps not even a good MIS candidate, because as I mentioned with MIS surgery, it does require a significant skill set. And sometimes the cases themselves can take longer than an open procedure because we have to do everything slowly and with just tactile feedback.

So a patient who is quite sick and may represent a high-risk surgical patient would probably be better done in an open fashion to make sure that the surgery is done as quickly as possible so that they can get off the table as quickly as possible.

Host: Dr. Ndu, what is recovery like? What's the benefit to the patient?

What is recovery like for the patient?

Bobby Ndu, MD: The recovery for the patient actually tends to be, with less pain and quite faster because there's less stiffness as there's less buildup of scar tissue because the scar is much smaller.

There is less pain because there was far less dissection that was required to accomplish this surgery. And our patients tend to be much happier because they're able to return to regular life and to activity much sooner than they themselves had even originally anticipated.

Host: Tell us a little bit about Penn Orthopaedics and what makes it so unique. You mentioned that you went there to do this program.

Bobby Ndu, MD: What makes Penn Orthopaedics particularly unique is there is a desire to want to provide the best for patients.

Now, while we absolutely want to be on the cutting edge in bringing the newest, latest, and greatest to our patients, we only bring things to the table that have been appropriately vetted, that have been in practice for several years and have a track record.

While MIS foot and ankle surgery sounds new, the track record on this is going back almost 10 years on patient outcomes and patient satisfaction rates with this. And that type of dedication to the long-term outcome while remaining on the cutting edge of what's available for our patients is what truly sets Penn Orthopaedics apart.

Host: Dr. Ndu, what an interesting podcast this was. Thank you so much for joining us and sharing your expertise for other providers today.

To refer your patient to Dr. Ndu at Penn Medicine, please call our 24/7 provider-only line at **877-937-PENN** or you can always submit your referral via our secure online referral form by visiting our website at **pennmedicine.org/referyourpatient**.