

Mayo Clinic Q & A - Soft Tissue Sarcoma - YouTube Audio 8 30...

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SPEAKERS

Dr. Halena Gazelka, Dr. Steven Moran, Narrator, Dr. Matthew Houdek

N Narrator 00:01
Coming up on Mayo Clinic Q&A,

D Dr. Steven Moran 00:04
At Mayo, we're really expanding what we can offer patients that have limb sarcomas. Not only are we working on ways of getting the muscle, and the nerve, and the lymphatics back, we're working on ways of controlling pain in those patients that still have to undergo amputations. And that's with essentially tricking the nerves into thinking that they're still going back to the muscles and the skin. And for patients that live with chronic phantom pain, this can be an amazing blessing.

N Narrator 00:33
Soft tissue sarcomas are a rare form of cancer that develop in places like muscle, fat, nerves, and tendons. Treating these cancers often involves complex surgery to transfer muscle and nerves. Today we'll discuss how new surgical techniques are helping patients recover faster and get back to life.

D Dr. Steven Moran 00:53

And with the advent of microsurgery, and some newer materials that we can apply to these muscles, we can have this transferred muscle regenerate and take the place of the muscle that's been excised, and we've been very fortunate to have patients go back to ambulating and back to some of the activities that they were doing before surgery.

D Dr. Halena Gazelka 01:15

Welcome, everyone to Mayo Clinic Q&A. I'm Dr. Halena Gazelka. Soft tissue sarcomas are rare forms of cancer that have been typically treated with what has been called limb salvage surgery combined with radiation therapy. While limb salvage surgery helps patients avoid amputations, patients are often left with substantial functional limitations. Now advancements in microsurgery are making it possible to harness the body's own ability to regenerate muscle strength after surgery that is performed to remove soft tissue sarcomas. This is a process called oncoregeneration, and it's our topic for today. Joining us to discuss our Mayo Clinic orthopedic surgeon, Dr. Matthew Houdek, and plastic surgeon Dr. Steven Moran. Thank you for being here today gentlemen.

D Dr. Matthew Houdek 02:05

Thanks for having us.

D Dr. Halena Gazelka 02:07

I think it's just wonderful to have all this brainpower together in one space. And I always say on this program that I love to learn something new every day. And I can tell already that I'm going to learn something new today. So, let's jump right in. Can you tell me what the standard course of treatment is for an individual who suffers from a sarcoma? What is limb salvage surgery anyway?

D Dr. Matthew Houdek 02:31

Sure, I can take that one. So, limb salvage surgery is a process where you're able to remove the cancer with a negative margin, and still be able to preserve the function of the limb. And so, in the 1970s, and 80s, we didn't used to think about doing limb salvage for patients. Patients presented and then oftentimes they are treated with pretty much an immediate amputation. And it was through kind of the developments of different neoadjuvant treatments such as mainly radiation therapy for soft tissue sarcomas, but also chemotherapy for patient's bone sarcomas, that limb salvage would be now a viable

treatment option for a vast majority of patients. And so, there's only certain times where we consider now amputations for patients, the vast majority of patients are getting limb salvage surgery. And so, it's through a multidisciplinary process where patients are first evaluated by either our service or the medical oncology service. We figure out what type of cancer they have, and then we go through the process of either referring them to radiation oncology for neoadjuvant radiation, which means giving radiation before the surgery. And then typically, we wait about three or four weeks, and then surgery is performed after that. And so, radiation helps with the local control of the tumor. So, it lets us be very close to the tumor where we have to be to save critical structures such as nerves and blood vessels. But there can be times where that's not possible, and that's where some of the regenerative stuff that we're working on can come into play.

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Dr. Halena Gazelka 03:52

What an incredible difference it must make to your patients to retain their limbs and their function and also their appearance. Honestly, when they have a sarcoma like this that has to be incredible to see the advancements that are happening.

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Dr. Matthew Houdek 04:10

It has really changed the way that we're able to approach patients. And then you know, the big thing is just the big teamwork that it does require to take care of these patients.

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Dr. Halena Gazelka 04:18

Sure. We hear so much about regenerative medicine now is oncoregeneration a type of regenerative medicine?

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Dr. Steven Moran 04:28

Well, I think, as you heard Dr. Houdek saying, you know, in the past I'd say 20 years we've been able to save these patient's legs, but many times they don't function very well. You know, Dr. Houdek talks about a negative margin. So, that means you have to take a rim of normal tissue around these tumors and that often results in patients losing the majority of their quadriceps muscle which allows the knee to extend or their hamstring muscle which allows the knee to bend. So, we save the leg, but the patient can't play sports, they can't walk with their spouse, things like that. So, now we have the ability to take muscle that's expendable, we usually take a muscle from the back. And we can put that in place of the muscle that Dr. Houdek has to remove. We're able to then roll that muscle into a tube so that it can either replace the hamstring or the quadriceps muscle. And then we repair the

nerve that used to go to the quadricep into this new muscle that we've transferred in. And with the advent of microsurgery, and some newer materials that we can apply to these muscles, we can have this transferred muscle regenerate and take the place of the muscle that's been excised. And we've been very fortunate to have patients go back to ambulating and back to some of the activities that they were doing before surgery.

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Dr. Halena Gazelka 05:55

That's amazing to me, Steve, because I am not an anatomist. But thinking about the function and the strength of the back muscle that has a very probably different function than what you'd have from your quadricep muscle. So, it's very interesting that a muscle can sort of learn to be a different type of muscle or to do a different function.

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Dr. Steven Moran 06:15

Yeah, that's true. I think we've experimented with different ways of insetting the muscle, but I think the latest technology now that allows us to tension and insert the muscle directly back into the bone has been very favorable in getting these patients back to doing what they want to do.

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Dr. Halena Gazelka 06:35

Tell me and tell our listeners a little bit about how you translate lab experimentation into clinical practice for patients?

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Dr. Steven Moran 06:46

Well, I think many times we have an idea and then we go to the lab, and you know, we either work in a cell culture dish, or we can use animal models that try to approximate the human condition. But it's always difficult to get a perfect match. I think many of the things that we're working on now in the lab are working with a special material called an exosome, which allows the body to harness some of the potential in stem cells and accelerate healing. So, right now what we're working on in this oncoregenerative model is using some of these exosomes which are produced here at Mayo Clinic and using those in the lab in a way that helps us regenerate our reconstruct missing muscle and missing nerve. And we're in the beginning process of an FDA trial right now, we hope that we can deliver this new research to our patients within the near future.

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Dr. Halena Gazelka 07:48

Wow. That's amazing. Matt, you touched just very briefly on a team-based approach and how a team is required to care for these patients. How is the team-based approach used differently and oncoregeneration than it might be in limb salvage surgery, or is it different?

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Dr. Matthew Houdek 08:04

I think, you know, the basics of it are kind of are on the whole framework of what kind of makes Mayo Mayo in the sense that we're all here to help the patient. And so, for oncoregeneration, these are cases that Steve and I typically do together. But you know, can we use other plastic surgeons as well? Yeah, well we do, but I think, you know, having the team we know pretty much exactly what I need to do. When I'm approaching the patient, I know what I need to make Steve's life easier putting the patient back. And so,

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Dr. Steven Moran 08:33

I don't think that you ever do that really though.

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Dr. Matthew Houdek 08:36

I'm kind of the destructor. Dr. Moran is the reconstructor. And so, you know, we have to take out what we have to take out in order to, you know, cure the patient of their cancer. However, I know that no matter what I do, I have Steve who can put the patient back together. And I think that's kind of having the team and the kind of, I guess, trust in the team too that knowing that no matter what you do, the patient's going to get through all this. But it does take a team in the sense that, you know, it starts with the initial workup. It starts with the initial scans and radiology and making sure the scans are done correctly. We get them to see radiation oncology right away. And, you know, we have a discussion with the radiation oncologist about, you know, what are we going to take, what are we going to leave behind, so that way they can plan their treatment fields appropriately to again, reduce the risk of recurrence. And then we take over for surgery. And Steve and I will talk about the case beforehand, and we'll know exactly what we're doing when we go in. And, you know, the vast majority of the time what we take out is what we plan to take out. And then Dr. Moran does an excellent job of putting the patients back together and we get the patients back. Because then afterwards too, it's the rehab and kind of working with the physical therapists and everything back here at Mayo.

D Dr. Halena Gazelka 09:40
That was a lot of confidence in your ability, Steve.

D Dr. Steven Moran 09:43
Oh, yeah, he gives me too much credit. I think that a lot of the stuff we're able to do now has really only been possible within the past decade we've had massive advancements in the microscope itself, allowing us to see things that at a much smaller level. Some of the things that Dr. Houdek is talking about removing are not only muscles, but nerves and lymphatic structures themselves. And all these things contribute potentially the patient's function but also to post-operative pain. And Dr. Houdek and myself have been working a lot with taking these nerves that normally would be left to scar into the wound bed and cause a source of pain and we're now reconnecting those to devitalized muscle. We're also putting back together the lymphatic structures that are divided anytime you have surgery in an effort to prevent patients from developing post-operative lymphedema, which is essentially swelling that can occur in the leg or in the arm that can cause pain and disfigurement.

D Dr. Halena Gazelka 10:48
What kind of outcomes are you seeing in your patients at this point?

D Dr. Matthew Houdek 10:53
Sure. So, a vast majority of patients are returning to ambulation without the use of gait aids or a brace. You know, we talked about, you know, sciatic nerve resection, and there was a study that was done here that looked at, you know, patients that had their sciatic nerve removed, and they have acceptable function. And so, but that's based off of scoring systems that we use as physicians to say, you know, what is someone acceptable at. You know, a sciatic nerve resection, oftentimes, patients will have to wear a brace, they'll need to walk with a crutch or cane, and when they start having kind of increasing work of walking or so, say they're trying to like walk uphill or upstairs, it becomes very difficult for them. And so, what we're able to do is we're able to restore that function through, we've done some vascularized nerve grafting, but also through the functional muscle transfers we're able to restore the knee flexion strength that they lose, through taking out the nerve to the hamstrings. And so, it's not oftentimes just the muscle. You know, so we can do this sort of process too when we have to take nerves out as well in order to restore the function as well, but the vast majority of the patients will have a restoration and at least active flexion or extension past gravity. Most of the times, they're able to do this against a lot of resistance too, and they're able to go back to doing all the activities that they want

to do. I recently had a patient come back who told me that he went out back to elk hunting, and so walking on uneven terrain, without any gait aids or anything with having pretty much the entire quadricep taken out. And so that's kind of a big thing for him, because, you know, it was a passion of his to do, and so they're still able to go back and do everything they want to do once they are recovered from it.

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Dr. Halena Gazelka 12:30

Wow, that is wonderful. Amazing. It must be very gratifying to care for your patients in that way.

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Dr. Matthew Houdek 12:36

It is.

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Dr. Halena Gazelka 12:38

Tell me what you see ahead. What do you think the next decade holds for oncologic surgeries?

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Dr. Steven Moran 12:47

Matt, maybe I could take this one. You know, I think at Mayo here we're really expanding what we can offer patients that have limb sarcomas. Not only are we working on ways of getting the muscle and the nerve and the lymphatics back. But for those patients that still cannot have limb salvage, we're working on newer options such as osteointegrated implants. So, this is something that really started in the military, and is just starting to come to fruition here at Mayo. But this is putting an implant into a patient's bone that allows them to kind of snap on a prosthetic that they can wear for the entire day. Some of the work from the military has shown that the people don't even take these off, they wear them for the entire day, which is something that's much different than what we have now. They can go back to much more, I guess, aggressive activities that we weren't able to achieve before in patients with standard amputations. In addition, we're working on ways of controlling pain in those patients that still have to undergo amputations. And that's with essentially tricking the nerves into thinking that they're still going back to the muscles and the skin. And for patients that live with chronic phantom pain, this can be an amazing blessing. And then finally, what we were talking about before by trying to harvest or harness I guess I should say, the body's ability to heal itself with this exosome material, which is something that can be made here at Mayo, for pennies, and put into these wounds and have the body essentially regenerate muscle and nerve. That's really

where we see the future of this field going over the next 10 years.

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Dr. Halena Gazelka 14:31

Wow, those are some amazing areas, and working in the pain clinic, I do see some of the unfortunate patients who have difficulty after they have surgeries for sarcomas or amputations for other reasons as well. So, that's exciting work. Matt, as you and Steve were speaking it struck me as I have heard from many others, how important it likely is for patients to seek out a center where there's a high volume and where there are experienced individuals when they want to be able to have the best surgical options that they can have. What would you say to that to patients? How do they know that they're getting the best care that they can get?

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Dr. Matthew Houdek 15:13

Sure. So, you know, the Institute of Medicine has kind of put an emphasis on, you know, quality of care and, you know, quality of cancer care, because it is a vulnerable patient population. And there's lots of studies that have been done to look at, you know, outcomes of patients with sarcoma. And even some of the stuff that we've done here through the Kern center and Optum Labs, we've you know, found that patients who are treated at higher volume centers oftentimes are able to avoid amputation. And so, patients who were treated at smaller hospitals or non-teaching hospitals had a higher risk of having an amputation with a sarcoma compared to larger centers or teaching hospitals where a vast majority of the time they'll have a limb salvage surgery. And so, a lot of that is the expertise and being able to bring patients in to have them see the multidisciplinary team that these cases require and leads to the better outcomes for the patients. And so, you know, quality is driven by numbers of cases per year. And so, here at Mayo, we're doing hundreds of cases of these soft tissue sarcomas a year. And it just kind of shows in the outcomes as well, that that's been shown in lots of different studies to show that, you know, the quality is always better if it's done at the high volume center. And we're always happy to see people from wherever. We're happy to do virtual care for them too and discuss their cases as well at our tumor board.

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Dr. Halena Gazelka 16:34

Oh, that's wonderful. Thank you so much. Any last thoughts that you'd like to share with our listeners today, either of you?

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Dr. Matthew Houdek 16:39

You know, it's an exciting field and, you know, we're happy to go over anything that patients have any questions on. We're always happy to do virtual visits with them. We're happy to get in touch and help however we can.

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Dr. Steven Moran 16:51

I would just echo that. If you have a question about your sarcoma care, please reach out to us. We're happy to always respond.

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Dr. Halena Gazelka 17:00

Wonderful. Thank you so much. I did learn something today. Our thanks to Mayo Clinic orthopedic surgeon, Dr. Matthew Houdek, and plastic surgeon, Dr. Steven Moran, for being here today to talk to us about sarcomas and the use of oncoregenerative surgery to manage them. I hope that you learned something, I know that I did. We wish each of you a very wonderful day.

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Narrator 17:24

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