Varicose veins and venous thrombosis: The latest treatment options

DR ROBERT McBANE: I'm **Rob McBane** from the Vascular Center at Mayo Clinic in Rochester. Today we have the pleasure of talking with my esteemed guests on the topic of venous disease.

To my far right we have **Dr Thom Rooke**. Next to him is **Dr Haraldur Bjarnason** and then **Dr Jeremy Friese**, and today we're going to be talking about venous disease from the very beginning to the very complicated areas. Welcome to each of you, and thank you for participating.

We'll begin with Dr Rooke. I'd like to enter the discussion regarding varicose veins, a very common problem in our country. Doctor, how common of a problem is varicose veins in the United States and in the world?

DR THOM ROOKE: Very common. It's probably fair to say that varicose veins are normal rather than the state of not having varicose veins. There's information from Scotland suggesting that, if you're willing to count little telangiectasias and spider veins, that as many as 80% to 85% of all people will have some type of varicose vein. In this country, I like to just throw out a number of 50% of people: Over 50% have varicose veins. I think that's a good number to keep in your head.

DR ROBERT McBANE: A wonderful bit of information. It's common. It's maybe normal. What seems to bring patients to clinical attention with varicose veins? What types of problems would they be experiencing that would bring them to your office?

DR THOM ROOKE: Probably, not surprisingly, the cosmetic concern becomes the biggest one, but there's a lot more to varicose veins than just the fact that they don't look good.

I'd say the second biggest thing that we see is pain. Patients will complain about discomfort, leg aching, tenderness in the region of their biggest varicose veins. We see swelling as a common side effect of them. We hear about leg heaviness and generalized discomfort.

DR ROBERT McBANE: What causes varicose veins?

DR THOM ROOKE: We used to think of the "traditional causes" for varicose veins as being the big ones. People would tell you, "It's due to too much standing. My job causes me to have to stand all day and that's why I got them"—and that probably does play a role. We know that things like pregnancy play a role in developing them. We have a standing joke that varicose veins are hereditary: You get them from your children because [varicose veins] come up so much with pregnancy! And of course, injury and damage to the veins, either from clotting, phlebitis, or some kind of external trauma causes them.

But nowadays it's becoming really clear that a lot of what we see with varicose veins are being caused by genetic factors, and we're now able to identify a number of these things ranging from the metalloproteases all the way across to some of the "growth factors." And, curiously, these same factors that seem to promote the development of varicose veins also promote the development of arteries and lymphatics. It's becoming clear, and

we're actually doing some work in this here at Mayo, that people who are prone to [develop] varicose veins may also be good at making collateral arteries and collateral lymphatics when they need them.

DR ROBERT McBANE: That's fascinating. Thom, I remember years ago when I first began [practicing] that the common treatment would have been to send these patients with varicose veins, particularly the large veins, for surgical stripping. Is that needed anymore? Do we still send patients for varicose vein stripping? Or do we now have alternative options? How do you approach that? Give us your general approach to patients and varicose-vein therapy.

DR THOM ROOKE: That's a very fair question. We still strip veins, but the number of [these interventions] have been plummeting in recent years, and the reason is because we have found less invasive, alternative ways to treat these veins. When we strip them, it's usually because a patient wants to be treated at Mayo and lives far from Mayo, so we need to do things in a one-shot attempt here.

The curious thing is that we can now treat these veins much less invasively than, say, your grandmother's vein-stripping operation was. When we do have to strip them, we're able to do it with ambulatory procedures. They can come in as an outpatient, get an ambulatory phlebectomy, we call it, with some very minimal incisions and go right home.

While that's still necessary in a few situations, the whole landscape has changed greatly with some of the new procedures. The biggest breakthrough has been the advent of catheter-based therapy for treating—primarily—saphenous veins but also some of the other veins. Luckily, I've got two colleagues that I turn to for treatment of this sort with catheter-based therapy. Using laser catheters or radiofrequency catheters, we can now burn the large veins shut from within and get rid of them that way.

The area that I tend to work in involves the use of a technique called "sclerotherapy," where I inject a material into the vein that will induce inflammation and destroy it. This has now become the new gold standard for smaller veins.

To answer the second part of your question—how do we decide?—I think we use procedures like stripping when patients need to be done at Mayo and they can't make two or three or four visits back. But if you're a patient who lives in the Rochester area and can come in, [we propose], a combination of a catheter-based technique to get rid of the larger veins and following that with two or three (sometimes more) sessions of sclerotherapy to get rid of the smaller veins seems to be more effective and is certainly embraced more by the patient population than the traditional stripping route.

DR ROBERT McBANE: Thank you very much, Thom. Since you bring up the issue of catheter-based therapy, might I ask some of our interventional colleagues about the catheter-based approach for great saphenous vein incompetence? Jeremy, tell us about the procedure, tell us about the indications, and perhaps some of the things that you look for in a patient who might benefit from that type of therapy.

DR JEREMY FRIESE: Like Thom said, catheter-based ablation has really overtaken [cases] that we previously would have treated with stripping. But you could even, I think, define what stripping is a little further. We do use stripping a fair bit, especially for folks that have focalized pain over a variety of specific varicosities. It's usually done in

conjunction with a catheter-based ablation. The key criteria—at least that we use for catheter-based ablation—are patients that have significant symptoms—or large, bulging varicosities—and have an insufficiency ultrasound that shows significant insufficiency (at least in multiple segments throughout the great saphenous vein and usually beginning at the saphenofemoral junction and extending into some aspects of the thigh and calf).

This is an outpatient procedure, and the reason that patients love it is they are able to get back to many of their standard activities of daily living, even the same day as the procedure. It's an outpatient procedure, done with conscious sedation, so no general anesthesia, and no incisions. A small needle accesses the great saphenous vein or some of the other veins that we treat. Our approach is generally to try to access below the level of the lowest incompetence—if that's in the thigh or even down in the calf we'll routinely do that. With the catheter options today, we now have access to longer catheters for tall folks as well as people that need treatment down in the calf.

DR ROBERT McBANE: A very successful technique.

DR JEREMY FRIESE: Technically, it's successful between 98% and 99+% of the time. At least in our experience, generally the folks where we're not technically able to close them are often patients that are on anticoagulation at the time of the ablation. Technically, it's very successful. And, frankly, clinically it's also very successful. We know that well upward of 90% of folks have significant clinical improvement—or even resolution of their symptoms.

DR ROBERT McBANE: That's exciting. Now, I want to move from varicose veins to venous thrombosis, and specifically we have experts in catheter-associated thrombolysis and mechanical thrombectomy. I want to turn the mic back to Thom and ask, if you have a patient with an extensive DVT, what types of variables do you consider when contacting one of our interventional colleagues? How extensive of a clot and/or where would the clot be in order to contact our team for more invasive therapies?

DR THOM ROOKE: Those are actually the two biggest criteria that we use when we try to make the decision of whether to lyse a clot or treat it conventionally: What's the extent of the clot? Where is it located? We're still working some of these things out. There are trials going on as we speak trying to answer both of these questions. In general, in my practice, I'm more inclined to lyse clots when they're more proximal and when they're more extensive. Those are the major guidelines.

The things that complicate this, though—or other factors you have to take into consideration—are the age and functionality of the patient. We're more likely, I think, to lyse young people rather than old people. The activity levels of the patient, the age of the clot, how far out are you catching it, how well you think the patient is going to tolerate conventional treatment or the more aggressive treatment—all of these become big factors. Are there other complicating underlying factors like cancer or injury? [What's] the bleeding risk? It's a very difficult and complex decision. I think proximal extent of the clot, symptomatology being produced by the clot, and the extent of the clot are the three big ones for me.

DR ROBERT McBANE: Very good. I'd like to ask Dr Bjarnason, you have an extensive experience—both of you have extensive experience—of actually doing mechanical thrombectomy and thrombolysis; tell us about the ideal patient.

DR HARALDUR BJARNASON: The ideal outpatient, as Thom actually mentioned, is the young patient with central or iliac vein or inferior vena cava thrombosis. Those would be the type of patients that we generally would say would benefit from the treatment. There are people that would say that femoral vein thrombosis might also be an indication. But the generally accepted indication is a younger person with a thrombus that includes the iliac vein, common femoral vein, and the inferior vena cava.

DR ROBERT McBANE: Very good. Tell us, Dr Friese, when you are seeing a patient for whom you are contemplating thrombolysis, what types of bleeding rates do you quote them as a bleeding complication?

DR JEREMY FRIESE: It depends on what their underlying history is. If they're an otherwise-healthy person—with no cancer and no previous surgeries and none of these other, sort of relative contraindications—significant risk of major bleed is going to be in the 1% to 2% range. And the risk of moderate or minor bleed is going to be in the 10% range.

DR ROBERT McBANE: Very good. Dr Bjarnason, are there any patients who have absolute contraindications to this type of procedure? Or are there patients who you counsel to maybe step back and do the more conservative anticoagulation route, as Dr Rooke mentioned?

DR HARALDUR BJARNASON: This is something we are faced with all the time. You have to weigh that cost/benefit ratio. The best patient is, obviously, the young patient that shows up with this as the only symptom and has not had any other illness before.

When you get patients that have cancer or they may even have brain metastasis, those are relative to absolute indicators. Some people would consider a patient with a brain metastasis or a primary cancer in the brain to be an absolute contraindication.

Most of the other contraindications are self-explanatory: a patient with active bleeding from the GI tract or trauma, recent trauma, you would seriously consider not doing a procedure or performing a procedure on a patient like this.

We don't have many absolute contraindications. Those would be mainly the patients that actually have ongoing bleeding. The other ones are in the gray zone, and you have to judge the benefits vs the risk on an individualized basis.

DR ROBERT McBANE: Some patients who have a contraindication to thrombolysis, in fact, could even have a contraindication to anticoagulation. On the flip side of that are the patients who could potentially be managed more conservatively (without an intervention). One of the things that has come to light in recent years is our use of vena caval filters. I would like Dr Friese to comment because Drs Friese, Bjarnason, and colleagues are putting these filters in and I would like you to comment on the appropriate use of an IVC filter.

DR JEREMY FRIESE: That's actually a really tough question. The utilization in the United States is quite different than the rest of the world. If you look over the past 10 years in the United States, the numbers [show] a 10% increase year over year. In fact at

Mayo last year we put in as many filters [as] the entire country of Spain—there's clearly a very different [rate of] utilization.

The reason that we absolutely think patients benefit [from a vena cava filter] is that patients who cannot be anticoagulated or patients that have failed anticoagulation will get a DVT despite being anticoagulated. Beyond that, there is a lot of gray zone, and so in the perioperative procedure in patients where we're doing thrombolysis, some people will choose to not do. Our general approach is we don't. But it's a tough question.

DR ROBERT McBANE: Dr Bjarnason, a temporary filter or a retrievable filter compared to a permanent filter, is that also a tough decision?

DR HARALDUR BJARNASON: In my mind, it is not an important decision because most of the filters that we have are called "optional filters"—they can be used as a permanent filter. It binds people's hands if you place a permanent filter and you don't have to consider removing it. But on the other hand, I think there are other benefits to just placing those optional filters. It has practical yield, and it's probably just as effective.

I would say that most patients should have an optional filter placed and then just based on the clinical situation, a decision is made if [removal should be attempted] or not.

DR ROBERT McBANE: Of note to the audience: We have a specific program that engages these optional filters so that we don't lose track of those patients. If the filter needs to come out, our colleagues in the vascular radiology [department] make a concerted effort to proactively contact these individuals so that that decision is not left unanswered and [these] patients are taken care of appropriately.

Very good. I want to thank each of you, Drs Rooke, Bjarnason, Friese, for an outstanding discussion regarding venous disease. We could go on and on. There's lots to talk about. It's a really exciting field.

We hope that you will continue to check out future content of Mayo Clinic's page on **theheart.org**. Thank you very much.