

**DR. CHET RIHAL:** Hi, my name is Dr. Chet Rihal. I'm chair of the Division of cardiovascular diseases at Mayo Clinic in Rochester, Minnesota. Today I have two guests with me. Dr. Sharon Hayes, who is the founder and former director of the Women's Heart Clinic, and Dr. Rajiv Gulati who's an interventional cardiologist in our catheterization laboratory. They have been working collaboratively on a very interesting and rare disease entity-- spontaneous coronary artery dissection-- that we'll be discussing today. Sharon, Rajiv welcome.

**DR. SHARON HAYES:** Thanks for having us.

**DR. CHET RIHAL:** Sharon, you and Rajiv and others have published a very interesting paper describing the clinical and angiographic characteristics of patients presenting with SCAD. Could you tell us about the patients that presented?

**DR. SHARON HAYES:** So this was a retrospective study looking back from 1997 to 2010 on 87 patients with SCAD. They were predominantly female-- about 80%-- average age 42% and were characterized by really virtually no standard or classic cardiovascular risks.

**DR. CHET RIHAL:** Rajiv, could you tell us about the angiographic findings? This is a large series isn't it?

**DR. RAJIV GULATI:** Yeah, this is the largest series by some distance. And we have long term follow ups who were able to see what happened to them down the line. But importantly, we should stress that this is not atherosclerotic dissection, this is a distinct entity. So the angiographic findings included a complete lack of atherosclerosis. We found that SCAD presented us multivessel SCAD in about 15% to 20%, which was a little surprising. And about half the patients presented with a full blown STEMI.

**DR. CHET RIHAL:** Sharon, and you mentioned these patients don't have typical risk factors and Rajiv re-iterated they don't have atherosclerosis, but are there triggers or risk factors that you observed in these patients?

**DR. SHARON HAYES:** Well, of the women-- which was our predominant group-- about 30% were in the peripartum time, and this has been reported previously. So there may be something about vulnerable arteries or the hormonal fluxes that may prompt this. The men tended to have as a trigger-- again, this is their recollection-- of extreme physical exertion. And we're not talking about running a 5k, we're talking about diving into a northern Minnesota lake in the winter or going to one of these boot camps, but extreme physical exertion. On the other-- we don't know if it's a cause or association-- is the fact that either through extra coronary screening, or through just looking at the femoral angiogram at the time of angiography, we found a high percentage of fibromuscular dysplasia or evidence of that.

**DR. CHET RIHAL:** So fibromuscular dysplasia may be associated with this condition. Rajiv, how often did you observe multi-vessel dissection of these patients?

**DR. RAJIV GULATI:** About 15% to 20% from recollection presented with multi-vessel dissection at the index event. But then, again, during long term follow up, about 15% to 20% of women-- and it was only women-- experienced a second SCAD event with a small proportion experiencing a discreet third SCAD event. So you can present with multi-vessel dissection, but once you do, it doesn't stop you from having another dissection down the line.

**DR. CHET RIHAL:** And can we make any comments about outcomes and treatments on the basis of this study, either one of you?

**DR. RAJIV GULATI:** Sure, so in terms of acute treatments-- I mean, this is a retrospective look, so it's hard to compare different treatment strategies. But I think we can get some idea. Those that were treated conservatively tended to do fine in hospital and afterward. Those that had angioplasty had a surprisingly high rate of procedural complication-- that did clinically OK, so survival was OK, but during the procedure itself, there was a higher rate of a few things. One, an inability to cross such a section with a wire. Second, a propagation and extension of this section-- and probably intramural hematoma with stent placement. So quite frequently we saw a situation that looked stable angiographically, but once a stent was placed there was slow flow because of propagation of hematoma.

**DR. CHET RIHAL:** Can you diagnose SCAD on the basis of angiography alone, or is IVUS mandatory?

**DR. RAJIV GULATI:** I think-- great question-- I think angiography, most of the patients in this series were diagnosed angiographically, but I have no doubt that we have missed some. But by not performing intravascular ultrasound-- or better still OCC-- to visualize a vessel wall, SCAD in itself may be somewhat of a misnomer. You can have an intramural hematoma without any dissection at all. So you may not see a dissection angiographically, just a narrowing which could be due to a hematoma. It's all part of the same disease process.

**DR. CHET RIHAL:** Were all arteries involved, including the left main or no?

**DR. RAJIV GULATI:** Yeah, absolutely. All arteries were involved, including the left main.

**DR. CHET RIHAL:** Sharon, you've set up a very innovative network of patients with SCAD who function as a support group and also contact you and others here. Could you tell us about the use of social media in this rare condition?

**DR. SHARON HAYES:** Although I was a facilitator, I would say that I was not an initiator. I think we can leave that and credit the individual patients who came together actually and found each other on a social media site through Women Heart, the National Coalition of their online community. And they had been told it was a rare condition, but found that it wasn't so rare as 70 women gathered on this web site and found, hey, we were told we were the only one, but we're not. And they actually approached us at Mayo Clinic to sort of forward this. But it's challenging. These women are from all over the world. And so we are looking at innovative ways to connect with them. To study this disease without many of them-- actually, without most of them-- coming to Mayo Clinic through sending their records, retrospective, and prospective follow up of these individuals.

**DR. CHET RIHAL:** So what would you say on the basis of your collective experience now are the top two or three messages for the cardiologists out there who may encounter a patient with SCAD once a year or every couple of years? What are the top two or three things they need to know?

**DR. SHARON HAYES:** Well, I think one of the things-- and it's actually changed our practice here at Mayo-- is if the patient is hemodynamically stable-- not having chest pain in the acute SCAD event-- there is value in observing. Perhaps giving anticoagulants and watching for 24 or 48 hours without going in initially and doing urgent PCI. I think that's one. I think that these individuals need more close extra coronary vessel assessment, either by physical examination or radiographic screening, to look for significant stenosis, evidence of aneurysms, or fibromuscular dysplasia in other vessels that may require treatment or at least follow up.

**DR. CHET RIHAL:** And for the women who present with peripartum dissection, is it safe for them to ever get pregnant again?

**DR. SHARON HAYES:** Well that's a great question, and it's one and many of their minds. Our current recommendation is that they do not get pregnant and use a permanent and non hormonal birth control method. Although we know that there have been several successful pregnancies in individuals, but obviously both physician and mom and partner are quite worried throughout the pregnancy.

**DR. CHET RIHAL:** So our guests today have been Dr. Sharon Hayes and Dr. Rajiv Gulati who have published the largest series of patients with angiographically documented spontaneous coronary artery dissection. I thank them for their comments, it's been very enlightening. And I hope you all out there have enjoyed it as well. Thank you.