Transcript ECG Ep 63

Announcer: Welcome to Mayo Clinic's ECG segment Making Waves Continuing Medical Education podcast. Join us for a lively discussion on the latest and greatest in the field of Electrocardiography. We'll discuss some of the exciting and innovative work happening at Mayo Clinic and beyond with the most brilliant minds in the space, and provide valuable insights that can be directly applied to your practice.

Dr. Anthony Kashou: Welcome to Mayo Clinic's ECG segment making waves. In this episode, we dive back into cardioneural ablation. Joining us again is an expert who continues to shape and develop this space. At Mayo Clinic. We'll review some of the fundamentals of cardioneuro ablation, the patients best suited for the procedure and some of the initial outcome data achieved here at Mayo Clinic. But first, let's introduce our guest today, Dr. Guru Kowlgi back with us again, an assistant professor of medicine at the Mayo Clinic in Rochester, Minnesota. He completed his medical education at Maulana Azad Medical College in Delhi University in India. Before pursuing further training here in the United States, he finished his internal medicine training at the University of Connecticut and Cardiology fellowship at Virginia Commonwealth University. Thereafter, he came here to Mayo Clinic in Rochester to complete his cardiac electrophysiology fellowship and he hasn't left since. He stayed on as a Mayo Clinic scholar and he completed a master's program in AI and healthcare. Dr. Kowlgi has authored well over 80 papers and manuscripts in the medical literature. He has interest spanning in cardioneuro ablation which we'll speak about more today, the applications of AI and healthcare and much more. He's a great educator and he actively participates in the medical community serving on committees and ed educational boards and editorial boards of, in the literature space. He earned several awards and it's no surprise that we wanna keep having him back. And I wanna make sure you can find him on social media where he's super active and is a great educator. You can find him at the rhythm doc. Dr. Kowlgi thank you for joining us again. Thank you

Dr. Guru Kowlgi: So much for having me, Dr. Kashou. You're always kind, appreciate it.

Dr. Anthony Kashou: Well, you know, I always get excited when I talk to you 'cause you have so much energy and you're just kind of exploring this new space and we've done, you know, a couple episodes looking at this cardioneural ablation, but we really, you know, you have some new stuff. But before we get there, maybe we could start with more of a refresher of like, what is this whole cardio neuroablation and which are those patients that would benefit most from, from this procedure?

Dr. Guru Kowlgi: Yeah, absolutely. So cardioneural ablation, like the name suggests, is the intersection of the heart and the nerves. So it's a kind of ablation where we are targeting the autonomic nervous system. And most specifically, we are performing a vagal ablation of the heart.

So we're taking away the vagus nerve supply to the heart. And the reason we do this is most commonly for patients with hypervagotonia or high vagal tone symptoms like refractory vasovagal syncope. Some patients with carotid sinus hypersensitivity, so when their vagal tone is high, they get low heart rates, they get low blood pressure, they get recurrent syncope events. And the, the right patient for this would be someone who's tried some conservative measures like keeping themselves hydrated, increasing the salt intake, try some compression garments, counter pressure maneuvers. And despite all of these measures, they're still having these syncope events and recurrent presyncopal events that affect their quality of life. So those are the patients I would think of doing this for. For our program patients were initially referred for permanent pacemaker, so that is also part of the guidelines as a class two B indication. So I saw most patients in that setting where they came for a pacemaker and I was like, you know, why don't we consider this ablation before we go for a pacemaker? And, and it's worked pretty well. So

Dr. Anthony Kashou: It's a great population. You and I've had success here with some patients. And you know, when you think of the history, because you were telling me this is not a new thing, how did it come about this whole space? Yeah. And when did you decide to, to launch that program here at Mayo Clinic?

Dr. Guru Kowlgi: Yeah, so the ablation has been around for a long time. So the initial few cases were reported out of Brazil. Dr. Jose Peron in Sao Paulo did these in the late nineties. One of the first publications was in 2005. And since then they've done hundreds and thousands of these cases in Brazil. And then after that there were some countries in Europe that took this over. There's some operators in Turkey who are very active with it in the US The first case was reported in 2019 and initially it was, it took a while for other centers to take this up. And then at Mayo Clinic, we started this a year and a half ago, you mentioned I did the Mayo Scholar Program. So that was a nice way where Mayo Clinic allowed me to go to different centers to learn new techniques. So I went to Brazil and actually learned from Dr. Jose Peron, who came up with this procedure many years ago and learned his techniques, who, which he has honed over the years. And then we started the program here at Mayo last October, 2023.

Dr. Anthony Kashou: Yeah. And I know it hasn't slowed down and in fact I was in the room right next door in front of you and I think you were doing one yesterday, so yes, I, I know you're busy and you know, so how many of these procedures have you done and and what are the outcomes from your end been from, you know, patient success and you know, from an operator yourself?

Dr. Guru Kowlgi: Yeah, so we've done about 30 cases so far. And then it's a good number considering, you know, we are also part of the national registry that consists of USA and Canada. So all the cases that were, that have been done here since 2019, amount to about 220, you know, or so, so, so even one the high volume centers in the country. And then when we started out, I didn't plan it that way, just happened to be that so many patients who are affected with this condition and

then referrals kept coming in. But these patients have done well. So out of the 30 patients in terms of the, I guess the indication to go for the procedure was recurrent syncopal events in pretty much all of them. So these guys, these patients were having syncope on an average like four to five times in the, in the previous years. So pretty frequent. And then post ablation, I'll say all except one have had no recurrent syncopal event and the one patient who had syncope had nothing objective on a, a loop recorder that was implanted. It was in the setting of getting blood drawn that he did have bradycardia and passed out. But you know, I, I'll take that success rate 'cause the literature reports about 85 to 90% success. That's, you know, we we're a little better than that at this point. And then so far things are looking good. So very promising and look forward to helping more patients with this.

Dr. Anthony Kashou: That's great. So I mean, you didn't induce any, you know, arrhythmogenic or malignant arrhythmia there. I mean that's, you know, this form of angle and that's, that's incredible. Like in terms of, you know, so we see the success in 30, you know, out of, you said 220, I mean you've probably done among the top five, I would say maybe even top one here in the US that that's doing this. And it's really amazing. Where do you see complications that might arise? I mean, from yours? Have you, you had any of it? What are your Yeah,

Dr. Guru Kowlgi: Yes. So you know, it is an invasive procedure. So we, we speak about the risk of complications like drawing access, complications of pericardial inflammation, pericarditis, pericardial bleeding. Fortunately we haven't had any major complications. Some, a few patients have had mild pericarditis. That gets better in a few days after the procedure. The one expected effect of this procedure is when we perform vagal degeneration, there's a higher predominant sympathetic tone in these patients. Their heart rate naturally goes up and that's almost a desired effect. But in some patients who start out a little higher, like let's say they're resting heart rate is seventies to eighties to begin with, they can go to the low one hundreds. And then in some patients that make pro some symptoms and, and trigger anxiety, we did have one patient who did not have symptoms, but then she was, you know, looking at her heart rate, which is like 105 all the time. And she was a little concerned about that. And then, then she said she had some symptoms. We tried a low dose beta blocker for a month and then her symptoms abated. So literature describes the same situation where they can have some sinus tachycardia early on. Most patients do well with it without symptoms, but if they have symptoms, low dose beta blockers does the trick. And then we can always stop it after they're feeling better. So nothing lifethreatening, knock on wood. And we hope to, you know, keep things that way.

Dr. Anthony Kashou: Right. And I guess you mentioned some of the beta blockers. Where are the effects now that you're kind of ablating the vagus nerve? Are, are the inputs not fully gone or, you know, how does that work there?

Dr. Guru Kowlgi: Yeah, so in terms of how much ablation we perform, it is based on vagal stimulation and baseline. So when we do a vagal stimulation and we see a heart rate and blood pressure drop, we ablate till that goes away and there's probably more vagal nerve input. So we're not doing a complete denervation unless it is needed for the patient. And even after the denervation, there is some data to say over the years, the, the nerve can renervate. So you can have renervation over a period of five to 10 years, sometimes shorter, sometimes longer. So that depends from patient, it's different from patient to patient, but at least in the short term, we are able to avoid pacemakers and improve their quality of life.

Dr. Anthony Kashou: You know, I guess before we end here, I mean in terms of Mayo Clinic and you leading this year, you know, where do you see this in our program setting it apart from, you know, others around the world? Is it similar to where you did your, your training during your scholar year? How do you see it?

Dr. Guru Kowlgi: Yes. So the approach is similar to what the folks in Brazil are doing. So essentially the way we stimulate the vagus is different than many other centers in the US at least. So one of the techniques that people use is they stimulate areas inside the heart and inside the bilateral atria. So upper chambers. And when they get a vagal response, they ablate their till that vagal response goes away. And that's an acceptable technique. And other centers do it anatomically where they don't stimulate, they just ablate these areas. What we do, I feel is a bit more objective where we perform extra cardiac vagal stimulation. So the catheter is sent up the neck with a vagus nerve at the carotid body, and then we stimulate there. And when we see a central response, we only have to ablate so much that, that that response goes away. So if there are four or five side patient, for example, if you ablate three sites and it goes away, in case yesterday for example, we had to update two sites and the vagal response went away. So we can stop right there. So one, it is objective, we know exactly when you have dealing with it, the heart, and then not causing the bradycardia anymore. And two, we limit our ablation such that, so, so we don't increase the risk of more arrhythmias in the future. So as you know, when you perform ablations with radiofrequency, we are creating scar tissue. So we want to not ablate a lot of the heart. If we can avoid, these are young, healthy patients for the most part. So we limit our ablation, get a complete, and that way I feel our approach is a bit more objective and has been reproducible and worked well so far.

Dr. Anthony Kashou: And that's wonderful. And maybe it goes back to why some of the, you know, you had a patient put on beta blockers, why they're still responsive because you're not, you know, fully ablating, you're using this extra cardiac stimulation. And I, I think that that's great. And as you know, well, you know that scar tissue, we don't wanna be triggering anything new. Well, in today's discussion, it, it was another exciting one here with cardioneural ablation and some of this excellent outcome data. Already 30 patients here in the last year and a half at Mayo Clinic. It's always great to have Dr. Kowlgi here with us to share the latest in this field. He's really leading the way here at Mayo Clinic and I really hope he'll come back and, and share any new updates. Again,

make sure to follow him. He's very active on social media and it's always fun to get him on here. He's got a lot of energy and a lot of great ideas. Thank you so much for joining us.

Dr. Guru Kowlgi: Thank you so much Dr. Kashou. Always a pleasure.

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