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INTERVIEW

Renal Denervation: Patient Selection for Hypertension and Beyond

An Interview With Lindsay Machan, MD

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At the 2025 SIR Annual Scientific Meeting in Nashville, Tennessee, *Vascular Disease Management* spoke with interventional radiologist Lindsay Machan, MD, from Vancouver Hospital in Canada, to discuss his presentation on selecting patients for renal denervation (RDN) treatment. Dr Machan, who gave the 2025 Dotter Lecture at SIR, also spoke about possible future applications for RDN.

With two RDN devices now FDA approved, how do you approach patient selection in your practice? Are there specific clinical criteria you prioritize when determining suitability for RDN?

I'm in Canada so it's a slightly different paradigm, but basically the same criteria, in essence. There is an overwhelming number of patients with hypertension. We don't really know the ideal patient, but most of us are starting with patients who are poorly controlled despite multiple medications or patients who are intolerant to medications. A lot of patients find they have side effects or intolerable effects when taking those medications, so those would be the 2 types of patients that we are starting with.

You mention the overlap between conditions associated with sympathetic overactivity—like metabolic syndrome and obstructive sleep apnea—and the indications for RDN. How do you envision expanding the use of RDN beyond hypertension?

It is going to have to be based on data. These are exciting potential applications and there are early indications that altering sympathetic tone does actually impact the outcome of those diseases. I think more robust assessment, first of all, particularly in controlled human trials, are needed, and then assessing the outcomes.

No matter whether we are practicing in Canada or the United States, we are in a cost-constrained environment. We are much more aware of the impact of unsustainable costs, so we have to be careful, but on the other hand, we are doing something that is sort of a preventative treatment. It is not the typical sort of endovascular treatment where we are usually treating an urgent situation.

We are treating hypertension to reduce the chances of stroke or myocardial consequences. In the case of metabolic syndrome, we are trying to improve longevity and improve liver function. We heard an excellent discussion about Type 2 diabetes in our session yesterday, a study done in China, which has potentially massive implications, but it also needs much more robust assessment to figure out where that fits in in comparison to, or in addition with, medication.

Now, we have better remote monitoring of patients with all these wearable sensors that are available; having those, my belief is that it may actually stimulate patients who maybe are not taking their medications as often as they should, that it might actually make them more aware of it.

For interventional radiologists looking to integrate RDN into their practice, what are some of the most important technical considerations?

RDN is a very technically straightforward procedure, and I would argue that interventional radiologists, among all the various endovascular specialists, have probably had the most significant experience with renal artery catheterization. But the most important considerations are the overall holistic management of the patient, particularly with hypertension. We know that all patients with

hypertension should have lifestyle modifications and should be on some type of medication. And they should be monitored regularly for all of those unwanted consequences. So, it is really important for interventional radiologists to work as part of a team because those patients need really good workup to make sure that they don't have some of the secondary causes of hypertension, such as primary hyperaldosteronism. They need to have that good workup and then be part of the management team longitudinally.

What are your strategies for engaging referring physicians and raising awareness about RDN as a therapeutic option?

I think hypertension specialists are becoming more aware of RDN. Our hypertension specialists actually approached me about how RDN can fit into the whole spectrum of care. I think the most important thing when dealing with clinicians and particularly the patient, is setting expectations because the average reduction is somewhere around 10 mm Hg in systolic, at least in the first year. Data suggests it gets better with time. But it is not a cure.

Unfortunately, RDN had a brief time in the sun and then it was considered a failed procedure. Part of that problem was that it was an over-promise. There were a lot of people thinking this was a cure and when it was only a 10 mm Hg reduction and they thought it was a failure. It turns out even a 5 mm Hg reduction in systolic, no matter how high the systolic is, actually creates a statistically significant reduction in all-cause morbidity and mortality.
That's important information. I think even the hypertension community was not aware of that until a couple publications in the *Lancet* that clarified it. Being able to deal with the perception it was a failure, and being able to discuss new data is essential to practice building.

Interventional radiology has longitudinal relationships with nephrology and internal medicine and various other specialties, but those two in particular who manage a lot of hypertension patients, because we are an inch deep and a mile wide, so we do a lot of procedures, so to them we are sort of a trusted provider. They know us, they know that we are going to deal with our own complications, and we are going to share care with them, we are not going to take this and run with it. For many clinicians, that is an important thing to know, that their voice is going to be important in talking about how this patient is managed, and do we do the procedure, and when?

I would like to stress that a team approach is important; regardless of what endovascular specialty deals with this, you cannot just do a procedure and then send the patient out into the community. They need lifelong care and management and monitoring. Including a primary care physician in all of this is important, because at the end of the day they always are the first touchstone with the patient.

The technical aspects of RDN are easy for us, it is a very simple, straightforward procedure. What's important is choosing the patients well. The reality is, when we look at it in Canada, and we think of the number of patients who can benefit from RDN, we don't have enough endovascular units. If we took this to its logical conclusion, about 30% of people have hypertension, if not higher, and a very high percentage of those are poorly controlled despite intense therapy. This is a lot of patients compared to any other endovascular procedure, especially if you add in diabetes, metabolic syndrome, and congestive failure. We just heard a presentation from China, a whole new area that none of us have heard of before, of hepatic malignancies, some of which have sympathetic control, so denervating them can actually accelerate other therapies. ■