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The Auryon Atherectomy System in Practice: An Essential Tool for Treating Severely Calcified Lesions

Jason Yoho, MD, discusses his experience with the Auryon Atherectomy System, how the forthcoming data from the PATHFINDER I postmarket registry correlate with what he has seen in clinical practice, and the device's role in treating calcified plaque.

Jason Yoho, MD
Interventional Cardiologist
The Texas Cardiac & Vascular Institute
San Antonio, Texas
Disclosures: Paid consultant to AngioDynamics, Inc.

When did you start using the Auryon Laser Atherectomy System (AngioDynamics, Inc.), and what led you to trying this atherectomy device?

Dr. Yoho: I started using the Auryon system (Figure 1) approximately 3 years ago, right when the device launched. It was memorable because it was at the start of the COVID-19 pandemic. It was a new atherectomy device that was different than what was commercially available, mainly because it could perform well in both hard calcified plaque as well as soft plaque.

I use intravascular ultrasound (IVUS) frequently during cases. In addition to plaque modification, one of the first things I noticed when I started using the Auryon System was modification of the medial arterial calcium, which allows the vessel to be softer and more relaxed, so a balloon can dilate more easily. That really excited me and made me more inclined to use the Auryon System.

How many cases have you performed using the Auryon Atherectomy System? What has stood out to you about this device from those cases?

Dr. Yoho: I have now performed approximately 1,000 cases with the Auryon laser. The reason it has been so successful in my labs is because of its ease of use and safety profile. A lot of other atherectomy devices take extra time to prepare or set up. I work in an outpatient setting and 95% of patients I see have chronic limb-threatening ischemia (CLTI) or wound and/or rest pain, so safety is of the utmost importance as it is for most clinicians. Knowing I can successfully perform the case and not worry about risk of embolization, vessel perforation, or any other complications makes a difference. So, the safety profile has stood out, and I've had phenomenal results with the device.

Do you use any other atherectomy devices? If so, why?

Dr. Yoho: I do. I'm a believer that you need to choose the right tool for each situation. Just like golf, players need more than one club to successfully play a round. Although you may have your workhorse device, you need to adapt to each patient's unique anatomy and clinical circumstances by adjusting your tools. That said, it's ideal to have a workhorse device that you can use in a predominant number of cases, and for me, that's the Auryon System.

Figure 1. The Auryon laser console.

As an investigator on the PATHFINDER I post-market registry, what can you tell us about that trial?

Dr. Yoho: The number one thing that the PATHFINDER I data shows is the safety of the Auryon System. *[Editor's note: Publication of the 12-month results of the PATHFINDER I study are forthcoming.]* PATHFINDER I is an all-comers trial, which is something that can be adapted to every single practitioner. Half of the patients enrolled in the study were CLTI patients with Rutherford class 5 or 6 disease. Not only did these patients have more severe disease, but their lesion lengths were longer compared to patients included in other studies.

Not only was safety evident, but the study's patient population correlated with what I typically see in clinical practice, if not even more difficult. The Auryon System really opens the door for interventionalists who are hesitant to use new techniques or implement new devices into their cath lab armamentarium.

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> *– Jason Yoho, MD*

A recently published article demonstrates the Auryon laser's ability to fracture medial arterial calcium.[1] Can you tell us about your experience using the device in calcium?

Dr. Yoho: Absolutely. This is probably one of the most important features of the Auryon System and why I use it frequently in my lab. A lot of devices work well on either soft thrombus or plaque while others work well on calcium. The Auryon laser is able to do both and can successfully treat in-stent restenosis (ISR). In addition, when we look at diseased vessels in tibials and even the superficial femoral artery, it's challenging for many atherectomy devices to modify medial arterial calcification. As I mentioned previously, through IVUS, one of the first things we saw with the Auryon System was significant medial plaque modification in these vessels.

The benefit of medial calcification modification is restoring the vessel back to its natural properties—really getting pulsatile flow—and modifying that plaque so that balloons and other tools we use can perform as they were designed. This means that we don't need high inflation pressures for balloons if we need to deliver a stent. That way, the stent is delivered and deployed more easily, and if it's successfully deployed it's able to fully expand.

The recently published micro-CT study looked at different cadaveric arterial segments with various degrees of medial arterial calcification and evaluated the Auryon laser's impact on it. Investigators assessed the results using micro-CT, a novel imaging modality that evaluates lesion morphology. The results showed that the Auryon System was able to crack medial arterial calcification in below-the-knee vessels. It's fascinating because the results correlate with what I see in my practice and why I believe I have had such good results—the Auryon System is not only modifying the plaque but also the medial arterial calcification through a lithotripsy-type effect and restoring that vessel back to its original state.

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The Auryon laser is also indicated for treatment of ISR and thrombectomy adjacent to a stenosis. What is your experience using this device for these types of lesions?

Dr. Yoho: One of the concerns that all practitioners face when performing atherectomy is sending plaque further downstream and creating more issues than what we started with. When we have ISR or an occlusion of a vessel, there is always concern that the plaque and thrombus can go downstream toward the toes, and the effects of that are, at best, slow flow of the vessel and, at worst, occlusion of those vessels. To solve for that, we can use filters or retrieval devices, but one of the benefits of the Auryon System is that the larger catheters (2.0 and 2.35 mm) have an aspiration component, which allows you to perform thrombectomy of any adjacent thrombus—whether old or fresh—minimizing what we send downstream and maximizing the benefit for the patient. It's extremely beneficial when we remove long, calcified occlusions. I am always hesitant to say that a device can completely eliminate risk, but the Auryon System certainly helps minimize that risk and makes me feel more comfortable doing these procedures.

The last thing that I'd like to mention is that with atherectomy devices, we often worry about lack of outflow. We tend to perform atherectomy on patients with more severe/complex disease, and being able to perform atherectomy on below-the-knee disease is extremely important. The success that I've had using the Auryon laser on patients with ulcers and below-the-knee disease who are at high risk of losing their limbs has been astounding. It's been enlightening that I'm able to use it and achieve such good results. ■

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– Jason Yoho, MD

1. Rundback J, Kawai K, Sato Y, et al. Treatment effect of medial arterial calcification in below-knee after Auryon laser atherectomy using micro-CT and histologic evaluation. Cardiovasc Revasc Med. Published online June 28, 2023. doi: 10.1016/j.carrev.2023.06.027

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