

**AMRITA SETHI:** We saw in recent years, in the past three years or so, the introduction of the AXIOS stent, initially a "cold" AXIOS, in 10 and 15 millimeter diameters. This still relied on the traditional method of entering collections. And then we saw electrocautery enhanced AXIOS again, in the 15 and 20 millimeters, for the drainage of pancreatic fluid collections. And really we were seeing a realization of our surgical equivalence of cystgastrostomies. And you know, we thought, this is fantastic. Can it really get any better?

And finally, now we have the 20 millimeter AXIOS stent. And the question is, are we dealing with the same type of stent? And what role is this stent going to really play now in our management armamentarium that we have? So there's not much out there. So this won't be as long a talk. But really the indications for the 20 millimeter AXIOS are the same as the 10 and the 15, which is the drainage of pancreatic fluid collection of pancreatic pseudocysts and walled-off necrosis.

And if we think about the indications for drainage of pancreatic fluid collections, we know well that we do not just drain collections for the sake of draining them or based on size, but we are really looking at symptomatic collections. And those might be those patients who are demonstrating signs of infection and sepsis, or gastric outlet obstruction from pancreatic head collections or body collections, biliary obstruction, as well as early satiety or failure to thrive, a general malaise.

So now we have quite a few stents available in terms of size, 10, 15, and 20. Which size should we use and when? And what are the benefits of the individual stents? Well, again, it's very early with the 20, so we don't really know these answers. But some potential things to think about is are there benefits of a larger lumen? Can we actually get faster drainage of our contents, the larger the lumen?

When should we look about the 10-- look at using the 10 millimeter? So in my practice, I very rarely use the 10 millimeter anymore unless I'm performing this in the duodenum, where you want to be a little bit more aware of the perforation, the thinness of the duodenal wall, the potential for bleeding, and overall, the decreased sort of diameter of the surface that you're dealing with. Smaller pseudocysts that are going to collapse quickly or that might only require one reintervention might be a place for the 10 millimeter.

The 15 millimeter, that's been our sort of workhorse, and I think that's really what most people are going to with-- and certainly have it in the past, for larger pseudocysts, particularly those that are going to require further intervention, and for walled-off necrosis with limited debris, again requiring a limited intervention.

So I think if we look at the abstract, and from my own personal experience, the 20 millimeter I think I am reserving for sort of larger walled-off necrosis that have a little bit more extensive debris that I anticipate are going to require multiple sessions and perhaps a larger scope to use a larger diameter scope, if there is an extreme angle for intubation, in terms of actually intubating the collection itself for further instrumentation, and I would like to try to see if there can be quicker resolution just having the stent in place.

So this is a case we actually did at our live course recently. This was a 67-year-old gentleman who's an emergency case, so that was kind of fun. A 67-year-old gentleman with diabetes, he had a history of gallstone, pancreatitis. And about two or three months earlier, he had his gallbladder removed, and he still had recurrent pancreatitis and development of a recurrent pancreatic fluid collection. He presented to us with abdominal pain, fever, leukocytosis, certainly suggestions of infected necrosis.

And you can see that on his MR, he had quite a large collection. I don't think this pointer works. But a large collection that it actually looked a little bit bi-lobed, and so certainly an indication, a symptomatic collection indication for drainage. So due to the size of this, and you can see also there's quite a bit of a bulge into the stomach-- he was having symptoms of gastric outlet obstruction as well-- I chose to use the 20 millimeter in this case.

So you'll see coming out the catheter of the cyst exploration, the catheter of the AXIOS. My technique is to certainly tent it, and then very slowly and steadily insert it in with cautery. Now here you'll see the proximal, or sorry, the distal flange open.

And again, due to the length of the parameters of the stent, which we'll show you in just a moment, you do have to make sure that you insert a little bit more of the catheter into the collection. And another difference in the placement is that you can see there is an eccentric sort of tethering of that catheter to one side. And that's actually what we look for a little bit more when we're placing this.

But right now, you see nothing happening on the screen. One is because we're talking during a live case. But the other is because I'm doing an EUS guided or EUS placement deployment of the proximal flange, so I'm deploying the proximal flange completely within the catheter of the-- sorry the channel of the scope. And then subsequently used the pusher to push a deployed flange out of the scope. And here you see a drainage and successful placement of the stent with drainage of infected fluid.

So this patient drained out about a liter or so of fluid, felt extremely better immediately upon being awoken and extubated, and did very well. The patient was actually discharged home a few days later. And however, did come back to us with signs of some infection.

So this is actually the image 10 days later. And you see almost complete resolution. I mean, you see large resolution of the fluid collection. We can tell that there is still some necrotic material left in the collection, but it has substantially reduced. And that's just 10 days after placement of the stent. So we subsequently-- you can actually see the stent there-- so we performed a repeat endoscopy.

Again, here we saw a collapsed collection with thick necrotic debris that was actually obstructing the lumen of the stent. So pretty rapid decompression, but it did result in obstruction. And we do know that is a described, increasingly described, adverse event that we're seeing with the 15 millimeters.

So in order to perform necrosectomy, we started to actually perform it through the stent, but found that due to the extension of the collection and the angle of the scope, that actually removing the AXIOS at that time was preferred. And so I removed both.

I did lavage with hydrogen peroxide a little bit, and performed a significant amount of the necrosectomy to achieve about 50-- remove about 50%, and then left some double pigtail stents in, rather than replace an AXIOS. There was a full formation of a fistula track. I wasn't worried about bleeding or perforation.

And two weeks later, we had a planned repeat necrosectomy. The patient had been feeling well since his repeat procedure and his collection was completely resolved.

So what are the differences between the 15 and 20? These are, you can see, some of the parameter differences. The length of the constrained stent is about 2 millimeter difference. And the stent saddle itself, in terms of the diameter, is about a 5 millimeter difference.

So compared to the 15 millimeter, the 20 millimeter stent has a greater raw wire outer diameter within the stent braid, and it has a greater number of wires to create this stent braid, and number per inch crosses of the wire, or diamonds, to form the stent. Basically all of this means that this is what was needed in order to allow for the same radial force between the 15 and the 20 millimeter.

In my mind, what it means is that there are some differences in the techniques that, again, we will see evolve the more stents we place. But just from my brief experience, I do think you need to place a greater amount of the catheter in the stent itself because as it opens up, it sort of rises closer to the top of the collection.

And very important is that we sort of become very savvy in doing this extremely quickly with a 15 millimeter. It's a bit of a competition sometimes to see how quickly you can do it, and really you can place the 15 millimeter cautery-enhanced stent within a minute. But with the 20 millimeter, it is important to pause after deployment of that first flange. You do need to give it time to actually form into the fully open.

And secondly, when you're pulling back, instead of looking for that sort of formation of a Hershey kiss appearance to suggest that you have good apposition, what you really want to look for is that sort of angle of the catheter to the stent itself to actually indicate that you have come proximal enough up against the wall in order that you'll be ready to deploy the proximal end in the channel of the scope.

And then lastly, when you're actually pushing the stent out of the EUS scope-- this is the deployed proximal flange-- you have to do a little bit more of the maneuvering of the catheter to actually get that stent out, and a slight more torque. There's a few tips, in terms of torquing, big wheeling away, but not pulling the scope too much, because you don't want to risk actually pulling the stent out of the collection.

So in conclusion, the 20 millimeter AXIOS is now indicated for pseudocysts and walled-off necrosis. It's likely more useful in larger pseudocysts and walled-off necrosis with a moderate amount of debris where we anticipate needing multiple repeat interventions, or when you're looking to have a longer lasting fistula, mimicking surgical anastomosis.

Deployment does require attention to a few steps. It's not exactly the same technique, although we will see that technique evolve with increased use. It does appear to be safe and effective. Again, we are paying attention to adverse events with all of the AXIOS stents and hope to get more data on that in the long term. Thank you.