SHYAM VARADARAJULU: Good evening, everyone. I'm Shyam Varadarajulu from the Florida Hospital Center for Interventional Endoscopy in Orlando, Florida. And I want to welcome you to the Boston Scientific symposium, On the Frontiers, Experts With EUS.

So we have got two exciting things with endoscopic ultrasound. For many years we've been complaining, and in fact, in 2008 when the EUS working group met in San Francisco, the top priority was the development of dedicated devices for performing interventional EUS. And that was a recommendation of about 26 experts from around the world.

And I think over several years of refinement, we now have a technology that enables us to do single-step devices without using multiple different accessories to perform what we want to do.

And the second thing always in the EUS literature has been to check position. Everybody does EUS, but unfortunately the outcomes are not the same. Some of us have an accuracy more than 95%, 99%, and some centers, it's 75%. We always blamed it on the needle, the type of acquisition, and it's all cytology-based, and we wanted more tissue. And hence, that led to the development of fine-needle biopsies. And I think now with Boston Scientific having acquired Xlumena and developing the new AXIOS stent, and with the development of a new FNB needle called Acquire, this is a very significant DDW for endosonographers.

So without much ado, I think we're going to have two sessions today. The first is going to be on management of walled-off necrosis. I think, once we have a technology, it's not business as usual. It's a technology that's easy to use. But we have to refine our practices and train our minds to use these technologies in the correct way so that we can have better outcomes.

So to talk about AXIOS today we have in the panel, Dr. Ken Binmoeller. He was very much instrumental in developing the hot AXIOS and the cold AXIOS stents from California Pacific Medical Center and, Dr. Chris Thompson from Harvard Brigham and Women's Hospital. So they are top experts in the field, and we will have the first session to start right now. So can you please join us.

[APPLAUSE]

So with the exciting devices, you know, we are getting more sophisticated with the questions-- feel free to text us at 22-333 BSE, EUS-- whatever questions you may have. I don't think it's possible for me to answer questions on an individual basis. But I think once your questions come in towards the end, we will try to answer as much as possible.

So it's very important for us to be sure what we are treating, so with the dedicated devices, like lumen pulsating stents. The critical questions are as follows-- What collections are we treating? And what patients are indicated for the procedure? What collections are immature or at high risk for an intervention? It is also important to differentiate fluid collections from things that look like fluid collections, because not everything is a pseudocyst or a walled-off necrosis. Very often we'll end up referred patients that are more complex and complicated that lance out to be tumors and so on. So it's very important for us to identify the correct patients.

And in fact, there's a revised Atlanta classification. And we all know that MRI or MRCP is the modality of choice for evaluating walled-off necrosis. So if you want to take a key message from this meeting with regards to radiological imaging, you need your T2-weighted signal-gated enhancement MRI-- T2 SGE MRI is what you need to tell your radiologist. And they are the cross-sectional imaging modalities that can quantify the amount of necrosis within a fluid collection, and differentiate very reliably a pseudocyst from a necrosis.

And this is the Atlanta classification that pretty much stratifies fluid collections to less than four weeks, and more than four weeks. If you got an attack of pancreatitis and the collection is less than four weeks old, in general, these collections are immature and you don't intervene. This could be either an edematous pancreatitis, or it could be necrotizing pancreatitis, and after four weeks, your wall forms.

If the collection is sterile, and it was just a pseudocyst, it could be a sterile pseudocyst. Or if there's an infection, we used to call it pancreatic abscess. Not anymore. Now we call it an infected pseudocyst. And then we can have necrotic collection that is very walled off and ideal for instrumentation. And this could be sterile or infected. Sterile necrosis we never instrument unless the patient is severely symptomatic. And infertile collections almost always will have gas within the collection, or the patient is septic, and this is an ideal patient for instrumentation.

So with that as background, there are different types of collections that be handled. So my first question is to Dr. Thompson. Chris, when you see a patient being referred to you for walled-off necrosis and you're being told to go and intervene, how do you stratify the patient and say, this is a patient who is a slam dunk. I can just go intervene, drain this patient and have a good outcome. Who are the patients you would stratify and say these are high-risk collections best managed at a tertiary center or with more caution?

CHRIS THOMPSON: Hmm. Well, certainly what you're showing there is a multiloculated collection, so that is something that I would think would be more complicated, and you would need a multi-disciplinary approach. Probably to drain this, you might need some extra drainage, a multi-gate, something else-- it's a little more complicated. So certainly some of the multiloculated collections higher risk, I think. Immature collections obviously are higher risk, and you probably shouldn't go into those.

Intervening vasculature is certainly an issue. And if you have blood vessels in your path, you want to really consider that a higher risk. Additionally distance away from the gastric wall is something I would consider, or from the lumen you're trying to access-- if you're more than a centimeter away, that becomes higher risk. So those are probably the four things that I think most about.

Additionally, I also think that collections along the paracolic gutters tend to be a little more challenging to deal with.

SHYAM VARADARAJULU: How about collections in patients with altered anatomy, somebody who has a Billroth II or a Roux-en-Y procedure, and they have a collection right next to the-- next to the bowel lumen. Are those connections also at high risk, or is there any precautions for people [INAUDIBLE].

CHRIS THOMPSON: I would think so. Yeah, fortunately, that's, so far, rare. But with Roux-en-Y gastric bypass becoming so common, if we would see that, we would consider that higher risk as well.

SHYAM VARADARAJULU: I mean you talked about an immature collection. Can we get referred-- I mean, you've got patients who come to the hospital from transfer from somewhere and the ICU is calling you, telling, well, there is this patient has been having pancreatitis. The white cell count is 40,000, there's 20 bands, they are septic, the blood cultures may or may not be positive, and, but it's only three weeks from the onset of pancreatitis. So this is, by definition, an immature collection. How do you handle those patients, and what do you do?

CHRIS THOMPSON: So from-- time wise, you're right. I mean the revised Atlanta classification places great emphasis on the time interval, and they state that the collection should be at least four weeks old. But having said that sometimes it's not clear what the actual time of onset of pancreatitis. So is it three weeks or four weeks? So we use this sort of as a general guideline, but really what's more important is to evaluate your imaging studies-- your CT scan or your MRI-- and determine whether there is a mature wall, whether it's encapsulated-- the collection. So that's really the key issue here.

So I would review the CT scan. I mean, just looking at this I could tell you on the left here, that definitely is not something that we should be draining endoscopically, because this extends way down into the paracolic gutter. There may be a role for endoscopic management at some point, but I would say as primary treatment, that would not be the way to go. I think you're going to get a lot of information just reviewing the CT scan.

Now if you're telling me that this collection-- this patient in the ICU with a high white count, septic, and has a walled-off collection, then I would say absolutely. That's someone that we should consider draining endoscopically.

I think the emphasis to place now is that we have moved away from open necrosectomy. Back, you know, historically, we used to take these patients to open necrosectomy. And the studies have clearly shown that the mortality of-- morbidity of open necrosectomy is horrendous during the initial four weeks-- so when these collections are immature, as you described. And so really what we would advocate now is a step-up approach, and that step up approach might start with percutanous, and then possibly with video-assisted retroperitoneal debridement as the next step up. And there may be a role for endoscopic management for these really sick patients in the ICU with immature fluid collections.

SHYAM VARADARAJULU: If there's a fluid collection and the patient is septic, is there a need that the patient should have a wall around that collection for placement of a percutaneous drain, or would the radiologist have a lower threshhold they'll just go and intervene in these patients? Can you--

KENNETH BINMOELLER: Yeah, so, we've learned a few things, now. We've learned that in fact conservative management without any debridement at all, any kind of intervention-- just antibiotics-- actually surprisingly has shown good outcomes. There was a meta-analysis recently that looked at several hundred patients that were treated with acute necrotizing pancreatitis, and they were infected and they were just treated conservatively with antibiotics. And I think that the number, like 60%, actually had good outcomes just on antibiotics. So infection alone doesn't mandate intervention.

So I think that needs to be said first, first start with antibiotics to see how the patient's responding. But if the patient's not responding and is continuing to be septic, then yes, you would go to, I think, percutaneous. And you don't need to have a walled-off collection for percutaneous intervention.

CHRIS THOMPSON: Before moving on from this slide, we were talking about timing of intervention and the role antibiotics play. And I think what's really important to note is that, that really does bias time for not only the wall to mature, but really for it to become more liquefied. It makes the procedure easier-- the longer you wait, the more liquification occurs, and it's just an easier procedure to do. So I think it is great to delay if at all possible, let the antibodies do their job.

I prefer no drains but if they need it, certainly do it.

KENNETH BINMOELLER: Such an important point.

SHYAM VARADARAJULU: Chris, when you see a patient being referred, apart from EUS, what are the important factors clinically, in history and physical, and the cross-sectional imaging that you would pay attention to confirm that this is nothing but a fluid collection in the pancreas?

CHRIS THOMPSON: Well, looking at patient history, you want to see if there's any history of pancreatitis, recurrent abdominal pain, any evidence of prior history of pancreatitis, alcohol, tobacco use. Are they losing weight, you know, could this be a malignancy? Any signs of malignancy, I would look for those. Trying to make sure that there's not something else that could be at play in here. So I think those are the things I look for in the history.

Cross-sectional imaging, what we're looking for, I guess, septations, central scars, things that would make you think, this could be some kind of cystic neoplasm versus a pseudocyst or walled-off necrotic collection. Look at the gland itself, are there areas of necrosis in the gland? I think that's probably a good thing to look for, stranding other signs of pancreatitis.

SHYAM VARADARAJULU: Is MRCP a much better modality to differentiate a cyst neoplasm or something else from a fluid collection?

CHRIS THOMPSON: I think MRIs are always better than CT scans. CT scans, you can't differentiate percent necrosis, you have a lot of issues with that. So I mean, MRIs are certainly better.

SHYAM VARADARAJULU: So during the procedure, things can change. We can sometimes, because we are very close to the stomach, with a EUS transducer we can look at the morphology of the gland, elevate the fluid collections much more better.

So Ken, what are the things that you look for, that, when you perform an EUS examination on a patient referred from collection, for a fluid collection drainage, you did your CT scan and an eMRI, and you're pretty sure that this was a fluid collection, and this is a necrosis or a pseudocyst, but when you do your EUS, are there factors that you will pay attention to say, well, this-- I may not be dealing with a fluid collection in the pancreas.

KENNETH BINMOELLER: Yeah, I go through a checklist. And so first of all, I start with just evaluating the pancreas, so if the remainder of the pancreas looks pretty normal, that should be a red flag. That doesn't fit.

Usually, you know, even if there's a clinical history of pancreatitis, if the remainder of the pancreas looks pretty normal, that should already raise some suspicion that maybe you're dealing with a cystic neoplasm. Because remember, these cystic neoplasms can compress the pancreatic duct, and it can cause pancreatitis. So you can have pancreatitis resulting from the effects of a cystic neoplasm.

And then evaluate the wall very carefully. And what you're paying particular attention to is any irregularity of that wall, irregular thickening, or maybe a mural nodule. So take the time to really scrutinize the wall. You want to evaluate the wall, anyway, because you want to determine whether this is an encapsulated fluid collection, but evaluate the actual morphology of that wall, as well. So those would be things to look at.

Now obviously here, you see that thick septum in the middle. There, you know, definitely the red light's going off-- hey, this looks suspicious for a cystic neoplasm.

SHYAM VARADARAJULU: This was another-- what is this? Can you explain this case? This was a case of one of your patient.

KENNETH BINMOELLER: Yeah, I sent you in the slides to look at-- this is just a few weeks ago, Shyam. And I was just embarrassed, and I wanted to show this to illustrate-- because afterwards I looked at my images and I realized I should have paid more attention to the wall.

Now, this patient presented 92 years old, with pancreatitis and abdominal pain, but she had no history of alcohol, no history-- no gallstones. And she had never had pancreatitis before. But I looked at the CT scan, which you can see on the far right. And I see this large fluid collection.

She had been having pain for many weeks already, at least four weeks. She was transferred in from another hospital. And I just sort of jumped to the conclusion-- this is a, you know, pseudocyst slash walled-off necrosis, and when I looked at the EUS, OK, looks like walled-off necrosis.

I didn't pay attention to the wall. And if you look at that wall, you can see the thickening there at the bottom. There's this thick mucin, gobs of it, coming out at me. And that's when I realized, oh my god, it's a mucinous cystic neoplasm. So even, you know, you have to take the time to scrutinize.

SHYAM VARADARAJULU: So a couple of questions on necrosectomy. I think all of us do a lot of necrosectomies. So the thing is once we drain that collection, the duct study has shown that close to 35% to 40% of patients get better just with drainage alone. So the important question is, when do you perform irrigation of the collection? You just place an internal stent, but when do you place a perc drain, and when do you irrigate? And if you do necrosectomy, how many sessions of necrosectomy do you perform, and when do you call your radiologist or your surgical colleagues for help?

So with that, Chris, I know that you probably do the largest necrosectomies in the New England area. You do patients pretty much every single week. So if a patient is referred to you for walled-off necrosis, how do you determine-- this is a patient coming to me, I will just deploy a stent, or, what will sway you from performing endoscopic necrosectomy at the index session?

CHRIS THOMPSON: Yeah, so we always we always go out. I can't imagine-- we have a few ex-Fellows and some Fellows here. I don't think we've ever not gone out in the first case. We just always do it. And the impetus behind that really is, every time you have to repeat a procedure, you're just giving yourself another chance for a complication. So every time you have to go back, you know, you're rolling the dice again. You could have another complication. So we want to get out and do what we can.

I tend to really spend a lot of time with aggressive lavage, though. And we use baccitracin, you can use hydrogen peroxide, you could use other things, but we aggressively lavage-- at least one to two liters-- and we want to clean the biofilm off the wall, and then, as far as necrosectomy, that's, you know, I think terminology isn't clear here. I tend to fragment stuff with-- I'll use rat tooth forceps and I'll fragment all the big chunks, try to break it up. And I'm using usually a large channel scope so we can aspirate some of that through. But I never really have spent much time grabbing the tissue and pulling it out through the access point. I try not to do that too much. So I tend to focus on aggressive irrigation, fragmentation, and I do that in the first case in pretty much all.

SHYAM VARADARAJULU: And how does fragmentation help? You still have not removed the necrotic debris out of the cavity?

CHRIS THOMPSON: Yeah, so I think the theory behind that is you're really allowing the body to take care of itself. This is walled-off, you have an opening, now, to the collection. And I take people off PPIs. I do some other things, you know, we give them diet coke twice a day-- we haven't published on that, it's a little weird. But it works, so, so, you know, it really gets out in the cavity, and that gastric acid does a great job of digesting the material, in my opinion.

So I'm just helping it. I'm giving it a running start, and making sure there's not any pockets that the acid can't get to. And so I tend to fragment it, lavage really aggressively, and then they tend to do very well. Majority really do get better within a month, they start really clapsing down and look good.

So why wouldn't I go out at all? You know, I don't know. First of all, if they only have a CT scan and your EUS, you really don't know what's out there, because CT and EUS are not very accurate at determining necrosis-- percent necrosis-- or anything like that. So if they have an MRI, it is clean and it looks like there's no debris out there, you probably could then not spend the time going out. But short of that, I tend to go out on all the patients.

SHYAM VARADARAJULU: Do you perform necrosectomy at the index session? Two, if you decide to perform necrosectomy on your patients, how many sessions will you perform on those patients? And three, when will you stop?

KENNETH BINMOELLER: Oh.

SHYAM VARADARAJULU: You had it, and you're going to stop.

KENNETH BINMOELLER: OK.

SHYAM VARADARAJULU: So question one?

KENNETH BINMOELLER: All good questions. All right, so, I will tell you about my protocol afterwards, after all. So firstly, I will [AUDIO OUT] at least for the past 10 years, my algorithm has not changed. What's changed is that it's become, with AXIOS, much easier and safer to create the conduit to the cavity. That's changed. So-- and believe me, I mean, that's what was so time-consuming. So now, the whole procedure has been facilitated by the ability to create a very quick conduit. But the management, the algorithm is the same.

So number one, whereas, you know, previously I would dilate up the tract. I usually will use the 15 to 18 balloon dilate it up to 18, I went into the cavity, and then I did what I called vigorous irrigation. Ann Chen's here and she was a fellow at CPMC, and so-- and probably remembers many of these. So we would debride-- call it debridement or irrigation, with at least a couple of liters of saline, and then we throw in some hydrogen peroxide at the end of that. We did not do active necrosectomy. Of course, there's loose particles that we washed out, but we did not actively remove necroses.

To answer your question, when do you stop, you stop when the necroses are gone.

The other part is to keep the patient on antibiotics the entire time, because the risk of infection is very high in these patients. But I brought them back at weekly intervals until the cavity was basically clean.

SHYAM VARADARAJULU: And you did them all as outpatients?

KENNETH BINMOELLER: Yes, I had them come back as an outpatient.

CHRIS THOMPSON: So it sounds very similar, except I don't bring them back. I think the algorithm sounds very similar to what I'm doing, except I don't bring them back weekly. I scan them in a month, and I see what it looks like in a month. Three weeks, a month.

SHYAM VARADARAJULU: And when do you call your surgeon or your radiologist as a first call? You got a referral from the ICU as an outpatient, you looked at the fluid collection and say this is not for an endoscopist, or this is not for endoscopy. I'm going to have those drained, or I'm going to call my surgeon to take care of this. Can you [INAUDIBLE]

CHRIS THOMPSON: If I can't access it, if it's too far away from the stomach, or duodenum, definitely I talk to them. We have a multi-disciplinary team that looks at these patients, anyway, really. So interventional radiology is at the table, surgeon's at the table. I'm starting to not really like these collections we're going in through the duodenum on.

You know, I think that, looking at my data, they don't seem to do as well as the ones that are connected to the stomach. Maybe in part because you're not getting acid out there. The acid is being neutralized by the duodenum, and I think that necrosis just doesn't clear up as quickly in those. So I'm starting to shy away a little bit from stuff that's paracolic gutter and you've got to get in through the duodenum.

SHYAM VARADARAJULU: And can-- when do you call your surgeon as a rescue treatment? You have tried five times, I'm sure--

KENNETH BINMOELLER: The only times I've called the surgeon really have been for complications, weeping, mainly. You know, I've had a few instances where I've had to call the surgeon or IR to try embolization, But no, I mean, I think I pretty much know when will you need the surgeon before I embark on my treatment. You know, failures of treatment are rare. Sometimes you'll get an infection or something that you have difficulty accessing or getting under control. Then you might call the radiologist to help but the surgeon?

SHYAM VARADARAJULU: What do you do for assessing response to treatment. I mean, is there a way objectively you can say, my treatment has decreased the size of the collection? What do you do? Ken?

KENNETH BINMOELLER: So previously, I was getting a CT scan at one month, I think that's your protocol as well. And and then I would review the CT myself, and that's so important, right. I mean, you can't rely on your report. You have to make sure that you get the CT and look at it yourself. And generally I use the three-centimeter rule, and if it's three or less, than I consider that resolved, and then I would bring the patient back for stent removal.

CHRIS THOMPSON: I still-- I do the CT scan between three and four weeks. I see them at four weeks and I look at the films myself-- and oftentimes with a radiologist, actually, and then we try to assess it together.

KENNETH BINMOELLER: So let me just ask you this, how often does that CT scan change your management? In other words you would--

CHRIS THOMPSON: It does actually.

KENNETH BINMOELLER: --look at that CT and say, well, you know, it's too early--

CHRIS THOMPSON: Yeah.

KENNETH BINMOELLER: --I want to leave it in there another month?

CHRIS THOMPSON: It does, because the stent itself-- I'm concerned about dwell time with the stents because I've had one patient that had a significant bleed with a stent. I think they clearly saw a pseudoaneurysm had developed and it looked like the stent with respirations was kind of rubbing on the vasculature, led to a pseudoaneurysm and they had a substantial bleed.

They did fine. Radiology took care of it. But I think the longer that stent sits in there, and the more kind of healed the cavity is and the tighter it gets in there, you run the risk of that happening. So when I look at that in a month, if it looks like the collection is nearly healed, but there's still something I want to drain, I take the stent out and I'll put pigtails in. If it's fully healed, I just pull it out. And--

KENNETH BINMOELLER: But it didn't change your management, though.

CHRIS THOMPSON: If it's really large, if it's very large, I don't do anything.

KENNETH BINMOELLER: Well, I mean, but you could have determined that with your EUS when you brought the patient back. Do you need CT scan?

CHRIS THOMPSON: But if I do nothing, if I did nothing I wouldn't need to do the EUS. So if it still is big enough for us not-- the stent's not going to be rubbing on the back wall, it's not collapsed enough where I'm worried about having a bleed, and it's still, say it's smaller, say it was 16 centimeters, and now it's eight centimeters.

KENNETH BINMOELLER: Yeah.

CHRIS THOMPSON: And it's coming down, it's doing nicely, I'm not necessarily going to go in and intervene again. So I'm saving an endoscopy in that situation.

KENNETH BINMOELLER: See, I'd feel that with walled-off necrosis, we have to take a completely different approach to a pseudocyst. With pseudocysts, you can throw in a couple of pigtails, and you could just leave it until the patients call if there's any problem, if you have fever, or recurrent pain. You can't do that with walled-off necroses. You have to bring these patients back, and you have to go back in and make sure things are clean and not getting infected.

CHRIS THOMPSON: The other thing I worry about with just doing an EUS is sometimes as these heal, they tend to loculate. And I'm not sure you're seeing those loculations with an EUS. You know, sometimes you'll see it heal, and as it heals you'll be left with two collections, and one is a little more distal to the other, and that's at risk of being infected. So when I'm looking at a CT scan and I start to see loculation occurring, I get a little more worried about that patient.

So I think the cross-sectional imaging still plays a role. It's less common that that happens, but it does happen.

KENNETH BINMOELLER: But in the final analysis I really trust my EUS more than I do the CT scan. I've been amazed at the discrepancy between what CTs show and what I see on EUS, so I've really come to really only rely on what I see on EUS. So I'm doing less and less CTs. And let's face it, patients are very more concerned and informed about the radiation exposure. Some of these patients have already had several CTs, right. And so you're just adding another CT.

CHRIS THOMPSON: MRI. MRI

SHYAM VARADARAJULU: Ken, this is a question to you. When did you leave stents permanently in patients with fluid collections? What stents are those? When do you leave them, and why do you leave them?

KENNETH BINMOELLER: Ah, so, easy answer on this one. Plastic stents only, so you don't want to leave an AXIOS in permanently. You know, that definitely will require further study, and there are some concerns, at least for drainage of walled-off necroses or pseudocysts that you-- it's called a pseudocyst because there's not a real wall there, and there are often vessels in that wall. So as it collapses down on the AXIOS, there is a risk of bleeding.

The Brussels group showed very nicely that you can just leave these stents in. It acts more like a wick and you get drainage alongside the stents, not necessarily through the stents. No different than how we'd manage chronic pancreatitis transpapillary with stents. So that's my protocol for these patients with disconnected duct. And they do surprisingly well just with a couple of pigtail stents in there.

SHYAM VARADARAJULU: So the last image is of a picture with an AXIOS stent that you can see. So this patient came to me with a delayed bleeding. Five months after I placed the stent, the patient had massive GI bleeding, and you can see a small bleed right at the base of the proximal flank of the stent. And this is the reason was that we left the stent for a longer time. We always leave plastic stents for about six to eight weeks, sometimes even longer. So we did not change our practice patterns. So this is one of the earliest cases where the patient presented with acute bleeding.

So with that as a background I think Boston Scientific is now developing an app. It's a very, very cool device, it's called a stent-tracking app. And it's going to tell you the stent's placed, and it's going to tell you how many patients you have, and when the stents need to come out, but I think this might be a very useful technology.

So what is your practice, now? How has things changed with AXIOS? What do you do? Can you give me a quick run-through of since AXIOS has come in, for treating your pancreatic fluid collections? How has it changed your practice, and what are your key messages for the audience?

CHRIS THOMPSON: Yeah I think that imaging-- that taking a look at this thing, at three to four weeks is-- between three to four weeks is imperative, and then I see them at four weeks. And I make a decision, if the cavity is collapsing, I usually take it out that day, or the next morning. And you know if I can not leave these things in more than four weeks, honestly, unless there's a big collection still there and I'm not worried about vasculature in the area, then I'll leave it in place. But I think you have to monitor it very carefully.

As far as how my practice has changed otherwise, the procedures have gotten a lot faster. So that's a good thing. I think the nurses all appreciate that. And so there's far less resistance to doing the procedures. But I think the algorithm has pretty much stayed the same, thinking through it. We have more nurses in the room that can do the procedure, now. Before, I had a select team of four nurses I would use, and that was it. But now now with this, we've broadened it to the entire nursing staff.

SHYAM VARADARAJULU: And no more fluoroscopy?

CHRIS THOMPSON: I use fluoroscopy still.

SHYAM VARADARAJULU: You use it.

CHRIS THOMPSON: I do.

SHYAM VARADARAJULU: For what reason?

CHRIS THOMPSON: Well, you know, I-- this is the only thing that I think is maybe a negative change, OK. Before, I would always go in and sample the collection and send that for culture. And I've cultured out on every single patient I've done. Now we can't really do that with hot AXIOS, so I'm not culturing. And I hope there's going to be a modification so we'll be able to get that fluid again, soon. That's one thing I think that is different.

There was another question, what was the other one?

SHYAM VARADARAJULU: So, OK--

KENNETH BINMOELLER: Fluoroscopy.

CHRIS THOMPSON: Fluoro--

SHYAM VARADARAJULU: Yeah.

CHRIS THOMPSON: Why use fluoro. You probably need it less. I used to like using fluoro for a variety of reasons. One thing I'd like to do is I'd take out some fluid, I'd put in contrast, because when you're going in with a cold system, I like to distend, thinned out that capsule and distended as much as possible, so I could easily push through with a Hurricane balloon and get in very easily. Using hot AXIOS we don't need to do that so much anymore, so I guess we don't need it for that.

But what you would see sometimes is, you see if there's a connection with the pancreatic duct when you put all that contrast in. You're really putting it under pressure to stretch it, and you might see a connection with the pancreatic duct or get some other information out of it. You do sometimes get a better definition of what's going on. But I haven't really thought about not using fluoro, so I'll have to think about it.

Do you use fluoro?

KENNETH BINMOELLER: Oh I'll start first with the fluoro. I haven't used flouro, I think, in more than three years. I do all of it just strictly EUS-guided.

SHYAM VARADARAJULU: And even for a nasocystic catheter placement, no fluoroscopy?

KENNETH BINMOELLER: So the only reason for using that fluoroscopy there is as you're coming out, you want to just make sure that your nasocystic catheter isn't being pulled back. That would be the reason to use it there, so-- But look, I mean, why not. If you have fluoroscopy, it's just an imaging modality, and if it can assist--

The only caveat about fluoroscopy is, at least for AXIOS, all right, you need to keep your eyes glued to the endosomal image. You cannot lose your position and so the problem with fluoro is when you shift from EUS to a fluoro picture, you've lost your EUS image. You're not keeping your eye on it, at any rate. And you just lose your position by just a few millimeters, and things-- planes start to shift. So I just think it's important to keep your eye at least primarily on the EUS image.

SHYAM VARADARAJULU: What are the two go-tos, if you had to choose three things, one, two, and three, to do a necrosectomy, what are those?

CHRIS THOMPSON: I want to be able to do high-volume lavage and a rat tooth for breaking up the thicker chunks of necrosis.

SHYAM VARADARAJULU: With that we will conclude this section and then we'll do a final biopsy. Thank you Ken, and thank you, Chris. Awesome. Thank you so much.

[APPLAUSE]