STUART AMATEAU: And hopefully going forward, I believe this is the correct language to speak about when you're talking about collections in the abdomen in relation to the pancreas.

These are based on the Atlanta classification of collections. Acute peripancreatic fluid collections, pseudocysts, early necrotizing collections, and walled off necrosis.

So taking those in turn, acute peripancreatic fluid collections are early, typically fluid, not much necrosis, and they're not very mature. Pseudocyst are more matured [INAUDIBLE] collections of mostly fluid. So 100% fluid.

And this is where the big issue with nomenclature happened, where people are calling walled off necrosis pseudocyst. And that's simply incorrect because walled off necrosis has necrosis. It has dead tissue with any sort of rim. Versus early necrotizing collections, with necrosis, fluid [INAUDIBLE] and [INAUDIBLE].

And understanding this nomenclature will help you then move forward in understanding when you should actually attempt drainage of either pseudocysts or walled off necrosis.

Again necrotizing pancreatitis occurs about 5% to 10% of cases of pancreatitis. Necrosis is defined radiologically. It's simply poor enhancement of issue that should be enhancing with IV contrast.

Sometimes it is more complex to understand what is necrotic [INAUDIBLE]. Is there healthy pancreas? If your patient has poor renal function you can't give IV contrast, it becomes a little more difficult.

Of course, it's not just pancreas that become necrotic it actually can become fat-- pregnant, or fat, which can stretch all the way down into the flanks. And then actually other organs themselves can actually become necrotic.

Also we should understand what a cystogastrostomy and a cystoduodenostomy. Essentially that's the tract that you're creating. And a lot of times you do that tract from one [INAUDIBLE] patient to another using a lumen-apposing metal stent. And that's somewhat of what we'll be focusing on today.

And that's simply a stent. Like stents that you deployed before, just with a different configuration and relative different purpose. Which is to actually allow for lumen to lumen apposition.

And again, we're going to focus our discussion today on pseudocysts and walled off necrosis.

So here is an example of a lumen-apposing metal stent. It's not the only one [INAUDIBLE]. This is called AXIOS And it's a flexible fully covered metal stent, again with a unique design.

And you see at the top left panel-- and again we'll look at this a little bit closer, actually in the video-- but you see what's unique about it. It's the handle. It's the fact that a physician can fully control the deployment of the stent.

Which is ultimately going to be the most critical point or part of any procedure that you do. Is that you are controlling it. It's not an assistant. And it's designed in such a way that you can do everything.

It goes typically, and was designed to be used through a therapeutic EUS working channel. It attaches quite well.

The newer version-- the Hot AXIOS-- has a port to allow electrocautery. In the top right panel you actually can see a schematic of the tip of the deployment device. And then on the bottom right panel you actually see what the stent looks like.

It never looks like this in real life, in that it's not over the deployment catheter like that. But it just gives you an idea of what the stent looks like after it's deployed in relation to the problem much it's actually stretched [INAUDIBLE].

So why am I here? Why am I the one actually giving this talk? Well you have to understand what's going on in Twin Cities. We've been prospectively maintaining a database of patients undergoing endoscopic transluminal drainage, or ETD for walled off necrosis back since 2009. Personally I've been doing this not since 2009, but for two years previously at another institution.

And we have not always used lumen-apposing metal stents. We've used other devices. And this typically was previous to use of the AXIOS in early 2014.

And prior to that we were actually needle-access, wire-access balloon dilation to form the tract. And then double pigtail stents like you guys are familiar with.

Since the release of AXIOS was initially cold, we used a 10 Fitch cystotome, deployed the stent, placed post-dilated stent. And then with or without having some type of double pigtail stent through that stent, whether it's a patency stent if you want to call it that.

And then since the inception of the hot platform, I think we very rarely used the cold for this indication at this point.

So I'm not going to go through our data. This is something that if you are interested in-- and I hope you are interested in-- we actually have an oral presentation tomorrow at 8:15 in location [INAUDIBLE] room two.

But what you need to know is that compared to traditional methods-- compared to double pigtail stents, and even fully covered self-expanding metal stents that were designed for other areas of the body-- we actually have better outcomes. We have earlier resolution of walled off necrosis and we have less complications.

And again, we could work through all of this. We could talk offline as well.

It's very important to understand the formal indications for lumen-apposing metal stent. In my world, we have to use it for either pseudocysts. Again, which are nearly 100% fluid filled collections that are mature. Or in walled off necrosis that's greater than 6 centimeters in size that is predominantly fluid in nature.

And there are smart reasons for those indications. And again we could talk offline about that. But they make good sense to me. It's also obtained indications in Europe, and more recently in Australia and New Zealand.

So let's look at some pictures. The next question is who do we even think about needing some type of endoscopic intervention? Or who even has necrotizing pancreatitis?

So these are two very different cases. At least by imaging. But in presentation the same. Patients come from an outside facility with significant abdominal pain, fever, and clinically stable in both situations. Difficulty eating.

So we obtain CTs. And I don't think-- we'll do it this way. We obtain CTs and we are most curious about these particular locations.

In the top panel you see what appears to be-- if it was enlarged-- it's actually some non-homogeneous area there, suggestive of necrosis. But it's a mature collection.

Meanwhile on the bottom left panel-- again same presentation-- we see very ill-defined collections. There's clearly no walled off area. There's nothing that we would necessarily say, yeah, this is great.

But these are two different presentations so far as imaging and what's going actually on clinically. One is a walled off necrosis and one is an early necrotic collection.

So the question is OK, while they're both symptomatic, I want to do something. Can I do something? Yeah to the top panel, no on the bottom panel.

Now I will talk about what you can do on the bottom panel if the patient is clinically unstable or deteriorating, but it's not an endoscopic at that point.

So we proceeded, we saw the CT. The next day we took the patient back in their stable fashion. Did a cystogastrostomy. And you actually see-- potentially you can see the lumen-apposing metal stent, which looks like a dumbbell. And a double pigtail stent, or a patency stent that we deployed.

Unclear to us at this point based on our data-- and we haven't really actually gone through and specifically looked-- but it's unclear if the [INAUDIBLE] stent is actually-- has utility or even needed.

So that bottom patient, actually we stabilized, put on some form of nutrition. In this case, an NG tube. Patient has nutrition. Goes home. Comes back even despite being on antibiotics with fever, increasing abdominal pain.

Reimage-- and this is about two weeks later-- you can actually see that the image has changed significantly. We see a now mature collection with what appears to be air. Suggestive of infection.

And at this point we decided you know, he's actually pretty ill. Came in at 2:00 in the morning. We did a multigate approach-- as people call it-- where we did a cystogastrostomy, a cystoduodenostomy. And we were able to begin our endoscopic interventions and subsequent necrosectomy.

So how do we do that? What were you doing at two o'clock in the morning? Well let's just look at a video. This video is from Boston Scientific. But this is the device.

The device, again showing that unique handle. And then the catheter down below that's going to go through your working channel and then actually out towards the collection.

Again, this handle allows you full control. Allows you the ability to have a stepwise deployment. It also allows the capability to apply electrocautery to gain access to the collection, whether it's a pseudocysts or walled of necrosis.

And here is the tip. It actually shows the electrocautery device. And we actually use 100 watt [INAUDIBLE], which is recommended. And it cuts very well.

So schematically then what you'll do is you localize your collection of interest. You have the tip start to impinge on the gastric wall or the wall. In this case the wire-- this is showing that a wire accessed [INAUDIBLE]. You apply electrocautery. You gain access.

And at this point, most of your stent, at least the distal end, is within the cavity. That allows you then to lock the catheter within that cavity and start to deploy that distal end. And I'll actually have enhanced endoscopic imaging in just a second.

But my biggest recommendation is be sure to maintain endoscopic ultrasound visualization. It's the best way to see what you're doing.

So at this point, we're happy. We're in the cavity where you begin to deploy the distal flange. We pull up after unlocking that slider there. And we actually start to deploy the distal-- and again, I'll show you this in enhanced optical ultrasound in just a second.

With that distal flange deployed, we can see that we now have to begin to make sure that we can get the proximal flange within the stomach, or within the lumen. We start to tent that distal flange. And then there are markers on the device that actually allow you to see where the distal flange will deploy, the proximal flange will deploy.

But I typically deploy it in my working channel and then push it out. Just what I feel most comfortable with. And again, you then have the ability to deploy that proximal flange under complete control. And you get the immediate gush of fluid that you're expecting to see. And you feel very reassured.

So let's do that same case but actually see what's actually happening for what we're seeing. So this is our-- I've done three pseudocysts in like two years. And I've done tens of walled off necrosis. I've decided to show you what-- it's a pseudocysts. Because I think they're great for demonstrations. They're rare.

This I'd actually consider a pseudocysts, This is a still shot from a CT showing the stomach being compressed by this large collection of fluid that's well mature with a rind, as they say.

Limited endoscopic white light imaging is needed. You see there's a bulge. Of course we're not depending on much so far as our white light imaging.

We're using a [INAUDIBLE] therapeutic EUS scope targeting our large walled off-- excuse me, our large, rind pseudocyst which is much larger than six centimeters in size. And we actually begin to measure it here.

You see in the bottom left there, the fluoroscopic imaging, it's very important to have an understanding of what your scope looks like before you deploy it. Because you want to be in as stable position as possible. Because things can get a little cattywampus quickly If you're not in a stable position.

You want to have as much control as possible. Make sure there's no collaterals. You just saw that that was the Doppler and then we start to impinge with the catheter here.

And we use HOT access. And you actually see some vaporization of the fluid. Both by fluoroscopic imaging-- more so by EUS imaging-- you actually see that your catheter tip is well within this fluid collection.

We in this instance, decided to put a safety wire in at this point. There's obviously a passage, a channel free to pass that wire.

And then once our wire is in, it takes the curl of the actual collection that we expect, which you see on the left. It's a large collection. You start to deploy the distal flange. Very secure.

And what you see there is also making sure we're well within the collection. Because you could deploy and the distal flange between the two of those lumens.

So there's the distal flange. It's got the exact echogenicity we're expecting. It's fully expanded at that point. And we start to tent it back. And now, we start, at this point, to depend on not just fluoroscopic imaging but also our white light imaging.

And what has happened here, first we deployed it in my working channel, and then push it out. The wonderful gush of fluid. And you feel really, really secure and very good about it at this point.

We post-dilate. So this is a 15 millimeter lumen-apposing metal stent. I usually post-dilate till we get 12, if not 15. We're not concerned about bleeding. This stent will tamponade any type of intervening vessels that were [INAUDIBLE]. Of course we avoided what we could so far as targeting [INAUDIBLE].

By post-dilating immediately you can argue you get a quicker effect. But more for me it's because it helps the stent take its desired shape and it seats it very well. I'm not worried about it migrating. I personally-- I can't speak for the world-- but I personally have never had one of these stents migrate inadvertently when deployed appropriately.

So always think these are complex procedures, complex patients. So you have to ask yourself-- you first to say is it indicated? Right? I mean that's what we talked about already. I'm harping on it. This is what I think is very important.

And this is adapted from the acute pancreatitis working group guidelines. But indications for drainage of pseudocysts and/or walled off necrosis are the following. Evidence of infection. Evidence of related multiorgan failure. If sterile, that means there's some type of mass effect such as gastric outlet obstruction, biliary obstruction.

You can have persistent symptoms such as pain. So you may see these patients come to you in clinic. Seen by another physician that said well I don't do this. Completely stable. They see you. You've got to ask are you having pain? Or are you having trouble eating?

There's actually terminology-- a state of unwellness as well. So if they have that, those are indications that we think is reasonable. Because that should turn around with an intervention.

And then disconnected duct syndrome. We actually have data presented on this topic as well. But the thought would be that well, then if you don't do something to drain this it's either going to keep enlarging or just persist. Because you have a disconnected pancreatic duct.

Once you work through the indications, you have to ask yourself is the patient medically optimized? Are the collections appropriate? Are they walled off or are they apposed to the foregut?

Are their are collections retroperitoneal or intraperitoneal? Now sometimes it's unclear if they're intraperitoneal. If it's extending to the root of the mesentery you can get in trouble with that. You can have a delayed perforation.

Even though everything looks perfect, and even though you could do the identical case the day before and not have a perforation. It could actually happen. These are things that you have to always consider.

Again, on some aspects that aren't in communication. We train this one area that's adjacent to the stomach. What about the area in the left flank? You can get cutaneous drain to address that.

How critically ill is the patient? Maybe it's not appropriate to do an endoscopic procedure. Maybe the first steps should be a percutaneous drain or even a step-up to a surgical procedure.

And then what was the etiology? Is an ERCP indicated? Do you want to do an ERCP at the same time? And some of the data is still to be discovered. When is the best time to do an ERCP with a disconnected duct?

One thing I will tell you is that you don't want to drain the disconnected duct pseudocysts by ERCP alone. Because if things don't go well you're infecting that pseudocysts and you're not giving a release for that infection.

Some deployment considerations. You guys may have caught some of these already. Cold versus HOT. Most people are using the hot access. It really simplifies things. It takes a relatively difficult procedure and it makes it simpler and safer and more stable.

Do you do this needle first in wire access? I'll tell you I still do. Even though I think I'm in the minority at least of my US colleagues across the country. A lot of people are going without wire access and going HOT. And I think there's actually good data that they're doing it well and safe. I still like to have the safety net.

Again, is the walled off necrosis adhered? What's the distance between the two lumens that you're-- the lumen that you're approaching? Recommended that it's less than 10 millimeters.

Are there intervening collaterals? One or two or three points of access? So multigate or single gate. Do you post-dilate? Do you do immediate debridement? My group does not but other groups do and they do well. Do you place a patency stent? Unclear about that.

Again, also remember that it's never a one and done. It's not a stick and run. You're going to at least have two procedures. Even if it's a pseudocyst, try to go back. Collect that stent in a timely fashion. It's recommended within two months. And sooner potentially if you have immediate collapse, you may want to get that stent out sooner.

We have done this with outpatients. I'll tell you that I like to observe them over night if you can do it as outpatients, in theory. And again, sleep serial necrosectomies can take hours. Especially if you put them all one right after the other. You add up all the time.

We've done necrosectomies for two to three hours. Actually we show one here in the bottom right. What actually is collected over time.

And then the question is also what is the first necrosectomy. Again, some people do it immediately. And we typically do it at about three to four days. We've been fighting to try to push it out seven days, and we don't think that's right. But I don't have-- no one has the data I don't think to tell you when the first time is the best time. Yet.

Always think of this as a multi-disciplinary approach to a patient. Bare minimum, my four partners and I discuss every case before we approach. And we usually want a consensus to say this is the right thing.

Because easily you can miss things on CT. Especially your radiologist can miss something on CT. And it's just nice to have that back up knowing that this is the right thing to do.

All of our patients we try to get surgical input. In fact, we try-- if they're sick enough-- to get them, at a minimum, to consult. But actually onto their service.

And this is important because rarely you may need to step up management. Rarely, they may need to bail you out due to a complication. And sometimes there's just no endoscopic window. So you'll go to a percutaneous approach, potentially. Or again, a surgical approach up front.

No matter what you do, vigilant follow up is mandatory. And that's something we do with all our endoscopies. But it's because early recognition of these complications is critical.

So here's an example. So not everything is as perfect as what I just showed you on many of these. And again, our complications with lumen-apposing metal stents happen less than our previous iterations of devices we use. But they still happen. And you have to be ready to deal with it.

So this is a patient who has pretty impressive what we thought to be mature, walled off necrosis. Spanning the pancreatic pale body head and then actually wrapping around to the duodenum suite.

Well we went ahead with a sort of multimodal approach. Patient did fine immediately. Was admitted. And then soon thereafter started complaining of abdominal people. We go a CT and we see air. This patient actually needed surgical decompression.

Bleeding is other complication. It's not always immediate. This was an actual outpatient procedure. Went perfectly. Patient came back two days later with hematochezia. Thought to be an upper GI bleed though.

And this is what I saw. I went in. I saw this. Blood within the lumen of the AXIOS stent. I went in, I started to just clear out the clot. Treating this like it's [INAUDIBLE]. OK, I've got to find the source of bleeding. I found this on the back wall. And then I removed that clot. And that ultimately led to a perforation.

Again, this patient surgical assistance. But I'm not cherry picking cases. These are our two complications. You have to know what happens.

And then this sort of goes to our whole paradigm of how do we manage these patients. And this has been published in the AJE back in 2014. This is how we propose that people should do it. For sure this it how our group does it.

So of course you optimize the patient. This whole thing of delaying four weeks-- this four weeks doesn't make sense. You delay it as long as you possibly can. Maybe it's six weeks. Maybe it's two weeks. We've done them as early as within the week and had great outcomes. We've done them as late as five weeks, six weeks and had bad outcomes.

So really just-- we based it on sort of the overall clinical picture taken together with the imaging. Decide if an intervention is indicated, as we talked about. Is it walled off? Is it not walled off?

If it is walled off, does it have an approach in which you can manage completely endoscopicly? Or does it have an approach in which you need to get sort of a multi-modal approach where you can [INAUDIBLE] percutaneous access as well?

Perhaps it's not encapsulated and the patient's relatively sick. You can then do percutaneous or even surgical initial step if needed.

And so I just keep pushing this. And I think all good endoscopists-- all of us hopefully in this room-- are exactly like this. We've got to be a thinker and then maybe a doer. Hopefully it's appropriate to be a doer.

So management of walled off necrosis and pseudocysts, I'm going to tell you, is not easy and is usually not straightforward. You'll never get-- the case that I showed you? You don't get those. They're just not like that. You may, and then that's great. But just be ready for it not to be like that.

And they never look as easy as they look on CT. I don't know what it is. And so I love having the capability. And you guys should develop this. You should have the capability of having your partners involved so you can call them in. And you can just have a peanut gallery or someone to assist you with thoughtful comments.

And you want to recognize patients who have acute pancreatitis related collections. What you're dealing with. Strategize upfront what your points of access are going to be. I think I need two.

My typical feeling is that if you can plan for two, that's great. But if you go you do your first one, the easy one, make sure your first one is in access with the easiest place to do the necrosectomy.

And then if you go look for your second one and it's decompressed, don't worry about it. That means that it was in communication and you're going to get good drainage. So don't stress about trying to find the second one if you had planned that.

Understand why you're doing it. Determine the optimal time to do it. And again, that can be difficult. And understand how to do this, essentially.

And then lastly I just wanted to thank everyone that I work with, as they help me on a daily basis. And this is the type of team you guys should all strive to develop.

Good partners that are doing this with you. Surgeons that can help you and give comments. A radiologist that can read the imaging correctly and astutely. And interventional radiologists that are willing to work with you timing wise.

Because I will tell you just as an aside, you want to do your procedure first rather then they do their procedure first. They can drain and then cap. But if they drain successfully your ability to then endoscopicaly do it becomes [INAUDIBLE]. Thanks for your time.

Can I answer questions? I don't know if there are any questions. I'm sure there are many questions potentially. If I made any sense to you guys, there should be. Does anyone have experience doing these? Anyone plan to do these? Potentially? Did I scare everyone away or did I--

But you know, again I think this is a-- just in short-- I think it's a game changing device. It really is, and I'm not just saying that. I mean it allows you complete control to do things that previously you may have been doing with a couple pigtails stents. And then banging your head against the wall trying to then get into-- across a tract that is very narrow.

Getting your devices that are not built to get across those tracts into collections to really help the patient. It all makes this whole process of draining walled off collections safer. And it gives us much more flexibility with what we do. And I think it's just-- I mean honestly, I think that this is the first step towards really us becoming endoscopists, not just maintain within a lumen.