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## An Expert Perspective on Pancreatic Necrosis Management

Dr. Buch:

What should we know about pancreatic necrosis in 2021? This is your host for ReachMD's *GI Insights* Dr. Peter Buch. Today, we are honored to be joined by Dr. Christopher J. DiMaio, who is Professor of Gastroenterology at Mt. Sinai School of Medicine and one of the lead authors of the American Gastroenterological Association, *Clinical Practice Update: Management of Pancreatic Necrosis*, published in *Gastroenterology*, January 2020. Welcome to the program, Dr. DiMaio.

Dr. DiMaio:

Thank you so much. It's great to be here.

Dr. Buch:

It's a pleasure to have you. Before we dive into the management of pancreatic necrosis, would you kindly review the types of pancreatic fluid collections?

Dr. DiMaio:

So pancreatic fluid collections occur alongside a condition called pancreatitis. So in brief, pancreatitis is when the pancreas is inflamed and with that inflammation, you can have seepage of fluid in the space around the pancreas. In some severe cases of pancreatitis, you can get necrosis, where the pancreas becomes so inflamed and the enzymes are literally digesting the pancreas you can get necrosis, cell death necrosis of the pancreatic tissue and the peri-pancreatic tissue, fat, and even other organs. So when you think about the different types of fluid collections one can get from pancreatitis, it depends on the kind of pancreatitis the patient has. If the patient has what we call interstitial pancreatitis, which is just the standard inflammation of the gland, you can get the types of collections are defined literally by their age. So in a patient with interstitial pancreatitis if you have a fluid collection that's less than four weeks old, it's call an acute peri-pancreatic fluid collection. These are very amorphous, they rarely cause symptoms, they rarely become infected, and the vast majority of these will just sort of dry up and reabsorb on their own.

However, if there is in particular a significant amount of fluid over the course of three, four weeks, that fluid will do what we call organize and it'll be ultimately surrounded by a capsule or an enclosed rim; and that is what we call a pseudo-cyst. In the past, all fluid collections were called pseudo-cysts. But now, we specifically define a pseudo-cyst as a pancreatic collection that's at least four weeks old that is filled only with fluid.

On the other hand, if we have necrotizing pancreatitis, the collections that tend to develop are necrotic collections full of debris. And this is very dense type of debris. It almost has the consistency of bubble gum, very tenacious, very tough to pick up sort of like peanut butter or, bubble gum. Again, if it's less than four weeks old, we call that an acute necrotic collection. And these can cause symptoms, particularly if they are large. Because they will often exert pressure on adjacent organs, think the stomach, the bile duct, the intestines. If they're very large, they can cause something called an abdominal compartment syndrome where the pressure is within the abdominal cavity are so great, that some organs stop functioning, kidneys, and the like.

So once you have an acute peri-pancreatic necrotic collection, those tend to stick around. If they're small, they may dry up, but most of the time, if they're large after about four weeks, they will organize into what we call 'walled-off necrosis' or WON which we just pronounce it "won." And walled-off necrosis is really the bane of the pancreatitis patient because for patients who develop necrotizing pancreatitis and develop a collection, such as a walled-off necrosis, their risk of death is very high, upwards of 30%. So that is basically the main most serious kind of pancreatic fluid collection we'll encounter.

Dr. Buch:

Thank you. When dealing with an infected necrosis, why is a CT scan-guided aspiration no longer needed under most circumstances?

Dr. DiMaio:

So the main issue with having these necrotic pancreatic collections, these walled-off necroses is that they can become infected. An infection of pancreatic necrotic collection is where the death rate can be very high, upwards of 30 even reported 39%. In the old days, so maybe within the past two decades, if someone has a suspected collection, they would often have the radiologist under sterile procedure insert a needle into the collection and try to aspirate it. There are two problems with that. One, there was not an insignificant number of false-negatives, and two, there's the rare event where inserting a needle into a sterile collection can cause an infection.

Now in 2021 we tend to use the clinical course of the patient to guide us. So if a patient is persistently febrile, persistent leukocytosis, persistent SIRS, systemic inflammatory response syndrome, and/or they're deteriorating clinically, that is a very good prognostic sign that the patient has an infected necrotic collection. And so the trend is just to go ahead and drain it. Even if it wasn't infected, it's likely to be that that collection is driving all of those other factors I just listed, and drainage is the first line therapy for that.

We give all these patients antibiotics, and a small percentage of them may recover just with antibiotics, but often times, the patient's clinical course will dictate whether or not the collection needs to be drained and whether there's an actual infection in there or not is sometimes moot.

Lastly, we have other signs of an infection in a walled-off necrosis and that is the presence of air. So any time we see a collection with air in it, that is pathognomonic for superimposed infection and is really no need to go stick a needle in to get a diagnostic aspiration. You can already just move on to therapeutic drainage.

Dr. Buch:

Dr. DiMaio, would you kindly discuss why enteral is preferred over parenteral nutrition in this situation?

Dr. DiMaio:

So this is a very important topic that I feel is often under-appreciated when managing these patients. If we think about the pancreatitis patient, particularly the patient with necrotizing pancreatitis, they are extremely ill and in the catabolic state. And as a result of this, there is loss of integrity of their protective gut barrier. And what happens is that because of the lack of integrity of the gut barrier, there is an increased risk of bacterial translocation. And that bacteria can translocate to any adjacent necrotic collections in the retroperitoneum. So by so-called feeding the gut, that allows the gut barrier to be maintained and prevents intestinal trans- bacterial translocation.

The alternative to enteral nutrition is parenteral nutrition, total parenteral nutrition or TPN. TPN in and of itself has its own set of side effects or complications associated with it, most notably bacteremia, fungemia, and sepsis. But the main problem with TPN is that it does not provide or does not impact that gut barrier, that compromised gut barrier, and thus the risk of bacterial translocation remains extraordinarily high.

The benefit of enteral nutrition over parenteral nutrition has been demonstrated in multiple prospective, randomized control trials looking at patients with severe acute pancreatitis and necrotizing pancreatitis. And when you look at the data, there really is no comparison. Patients with severe pancreatitis and necrosis who receive enteral nutrition have a significantly lower rate of complications from their disease course, lower rate of infection of their necrosis, lower rates of death, and less need for ICU or shorter length of stay. So the benefits are really undeniable, and it really is the standard of care for management of these patients.

The only time we would consider parenteral nutrition in a patient is if we've exhausted all routes of enteral nutrition. If they can't eat by mouth, if they can't tolerate a nasogastric tube or a nasojejunal tube, then we really have no choice but to do TPN. But my experience is that these are very rare circumstances and again it really is the standard of care, and we should push as hard as we can, 'cause in many cases, this is the one intervention that we can do that has the most impact on the patient's clinical course.

Dr. Buch:

Thank you.

For those just tuning in, you're listening to *GI Insights* on ReachMD. I'm Dr. Peter Buch. Today, we are discussing pancreatic necrosis with Dr. Christopher DiMaio.

So, Dr. DiMaio, when might pancreatic drainage or debridement be necessary in non-infected necrosis?

Dr. DiMaio:

So in non-infected or sterile necrosis, the decision to drain it needs to be made very carefully. As I mentioned, large collections can cause a number of symptoms and complications. One example would be if it's compressing the stomach or the intestine preventing the

patient from eating or compressing the bile duct, causing jaundice or cholangitis. Those would be certainly acceptable indications to drain.

A subset of patients though will have very large collections that may not be causing any kind of obstructive process. But they may just be driving this sort of catabolic state and keeping the patient in what we call a state of "persistent unwellness." Meaning they're just consistently in SIRS, they're tachycardic, borderline blood pressure, fever, even in the absence of a proven infection or bacteremia. In these patients even though they likely have sterile necrosis, drainage will reverse this inflammatory process and inflammatory cascade and often result in a dramatic improvement in the patient's condition.

So the decision to do this is very nuanced and as we see that in perhaps places where they're not as experienced with dealing with this or seeing this, sometimes the tendency would be to rush to drain any collection. And really we try to avoid that because if a collection is asymptomatic and the patient is doing well, there really is no indication or benefit to doing that.

Dr. Buch:

Thank you. Why is transmural endoscopic drainage the preferred method of drainage for walled-off pancreatic necrosis?

Dr. DiMaio:

So for patients with walled-off necrosis, about twenty years ago the standard approach to managing this was surgical necrosectomy. These were very long, arduous, and risky operations. They were all done open. It would usually require having the patient come back to the operating room multiple times over the course of two or three weeks so they would be left with an open abdominal wound, which was packed. As you can imagine, the risk of complication and particularly death from this surgery was very high. Over the years, there's been some minimally invasive options available. One is the use of percutaneous catheters, which can be inserted into the collection and be used to irrigate and drain these collections. Another minimally invasive approach is something called video-assisted retroperitoneal debridement and I typically explain this to patients as being like a laparoscopy of the retroperitoneum, which is where these collections typically occur. And then lastly is the endoscopic approach, which is performed under endoscopic ultrasound guidance where EUS or endoscopic ultrasound is used to visualize the collection, typically it's adjacent to the stomach or the intestine, and using various endoscopic tools, we can create a drainage fistula between the GI tract wall and the wall of the collection. And the advantage here is that it's all internalized drainage. So the patient's collection will drain directly into the stomach or the small intestine, through the fistula that we've created, we keep that fistula open with dedicated stents, we have stents that are specifically dedicated to creation of pancreatic collection fistulas of the GI tract. And the bottom line is why would one choose that? The obvious answer is that it's all internal. The patient doesn't have any drain sticking out of them, it's much it's much more comfortable for the patient and much less risky than having a large operation.

The scientific answer is if you look at the data comparing the use of endoscopic transmural debridement of necrosis compared to traditional open surgery, or some of these minimally-invasive approaches, endoscopic drainage is far superior in terms of fewer number of procedures, fewer complications, lower cost, and lower length of stay. And I think really the landmark studies that have been published prove this and are well-accepted. And I think the mark of a true acceptance is when our surgical colleagues come to us and prefer to have us do these drainage and debridement procedures as opposed to doing it surgically.

Dr. Buch:

Thank you. And it's a perfect segue to our last question: under what circumstances do we need the help of surgeons when treating pancreatic necrosis?

Dr. DiMaio:

So it's my opinion that every case should have a surgeon involved for a number of reasons. These are very complicated patients that I often say that they're sometimes the sickest patients in the hospital. And managing this in a truly academic and evidence-based way, it should be done with a multi-disciplinary approach; with gastroenterology, surgery, and perhaps interventional radiology, we always have our critical care colleagues involved, as well as infectious disease. So it's our practice to involve surgeons for just about all these cases. For multiple reasons. One, it's always good to have a second set of eyes on the case and think about other possibilities for this patient. Most importantly if there is a complication during one of the endoscopic treatments, it may require surgical back-up, so we certainly want the surgeon on board to understand the patient from the beginning as opposed to sort of calling the emergently and them not having any familiarity with the patient. But really these patients were traditionally managed surgically and it's only been over the past decade that it has transitioned over to the endoscopist. But we have a good working relationship with our surgical colleagues, and we should take advantage of that for the betterment of the patient.

Dr. Buch:

Sounds like a wise approach to this. I want to thank Dr. Christopher DiMaio for helping us better understand the management of pancreatic necrosis. Dr. DiMaio, it was great speaking with you, today.

Dr. DiMaio:

Thank you so much for having me. This was a pleasure.

Dr. Buch:

Thank you, sir. For ReachMD, I'm Dr. Peter Buch. To access this episode and others from *GI Insights*, visit [ReachMD.com/GIInsights](https://ReachMD.com/GIInsights), where you can Be Part of the Knowledge. Thanks for listening and see you next time.