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[MUSIC PLAYING]

The program began in 2009 with Dr. Morgan and Dr. Adams.

We are the number two largest program in the world in terms of volume.

We've done almost 275 surgeries.

One in about 20 hospitals that can perform the surgery.

We typically do about 20 to 25 surgeries a year.

Our patients with chronic pancreatitis that have an underlying genetic mutation such as CFTR, SPINK, or PRSS1 tend to do better with the surgery.

We know our patients with genetic mutations, their pancreatitis is not going to go away versus someone who maybe drank or had an idiopathic reason.

You know, they could stop drinking, and the pain might get better.

But with genetic pancreatitis, it's always going to be there.

So this procedure typically helps them the most.

If we just perform a total pancreatectomy, they can have a hard form of diabetes to control.

And so we couple that with an islet auto transplantation where we take their pancreas and remove the islets and then return those islets back to the patients so that they can have an easier to control form of diabetes or hopefully, in some cases, be insulin free.

So the islet cells are the cells that are involved in glucose homeostasis.

So they have the beta cells that make insulin.

So that's an important component.

But they also have the alpha cells and the other counterregulatory cells, or cells that make the counterregulatory hormones to help maintain glucose homeostasis.

Approach to the program is we would get the patient referral either from the referring physician, or patients can self-refer.

We'll obtain their medical records and see what their history is regarding pancreatitis.

They would come in for a preop visit, which includes islet cell testing, it's a series of bloodwork, and a glucose tolerance test to evaluate that their islet cells are functioning.

And then they would meet with Dr. Morgan and our team, which includes her, myself, our PA, our dietician.

It can include our behavioral medicine team and our research team.

So in the operating room, during a total pancreatectomy, we remove the whole pancreas in a way that preserves the blood flow until the very last minute so that the islet cells get good blood flow until we remove the pancreas.

Along with the pancreas, we take out the duodenum along with the end of the bile duct and the spleen due to trying to preserve the blood flow again.

And just anatomically, that's what makes the most sense.

So after we remove the pancreas, we immediately put it in a cold solution.

It's balanced electrolytes, similar to University of Wisconsin's solution, or Viaspan, and this helps to preserve the pancreas until we're able to move it to the lab to have the islets removed.

The clean lab is where they harvest the islet cells from the pancreas.

It's a sterile room that they get the pancreas from the OR on the day of surgery.

It's definitely helpful to have the lab here on MUSC's campus.

They use a process where they take the islets and add in a collagenase, which is an enzyme that helps to break down the pancreas, and then they run it through a circuit that heats up the solution so that the collagenase works in its optimal setting.

And they're able to break down the pancreas and then separate it by weight, really, or by mass into exocrine and endocrine tissue.

And so they're able to separate the islets from the exocrine tissue.

And then the islets are placed into a bag of albumin along with some heparin to help prevent clotting when it goes back in and some antibiotic to help prevent infection.

And so that bag is what's taken back to an interventional radiology suite to re-infuse into the patient.

Fuse them carefully by gravity into the portal vein.

We include heparin in the solution to help keep the islets themselves from clumping together.

And then they go through the main portal vein and disperse themselves into the liver kind of evenly throughout.

Once they get to the end of the blood vessels, it's like a branching tree.

The islet cells will start to set up within the liver, and they grow their own blood vessels and start to set up their environment as early as a few days.

And over the course of about a month, they really start to mature that new environment for themselves.

And so we really see improvement in blood glucose management over that first month.

And then up to really three months, we see improvement often of the islet function.

It's pretty remarkable.

My mentors before me, both in GI surgery and in GI medicine, had a special interest in pancreatitis for decades.

And so it was a natural progression for us to develop this sort of cutting edge technology a decade ago.

And so I think that history really makes us a unique environment to take care of the whole patient and not just offer a procedure.