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Piotr Witkowski Lab

Total Pancreatectomy with Islet Autotransplantation in Patients with Chronic Pancreatitis and an Intractable Pain- 8 Year Follow Up

Ogledzinski M, Gondek S, Milejczyk K, Lin W, Juengel B, Sadek A,
Basto L, Perea L, Wang L, Tibudan M, Barth R, Fung JJ, Matthews J.B, Witkowski P

Introduction

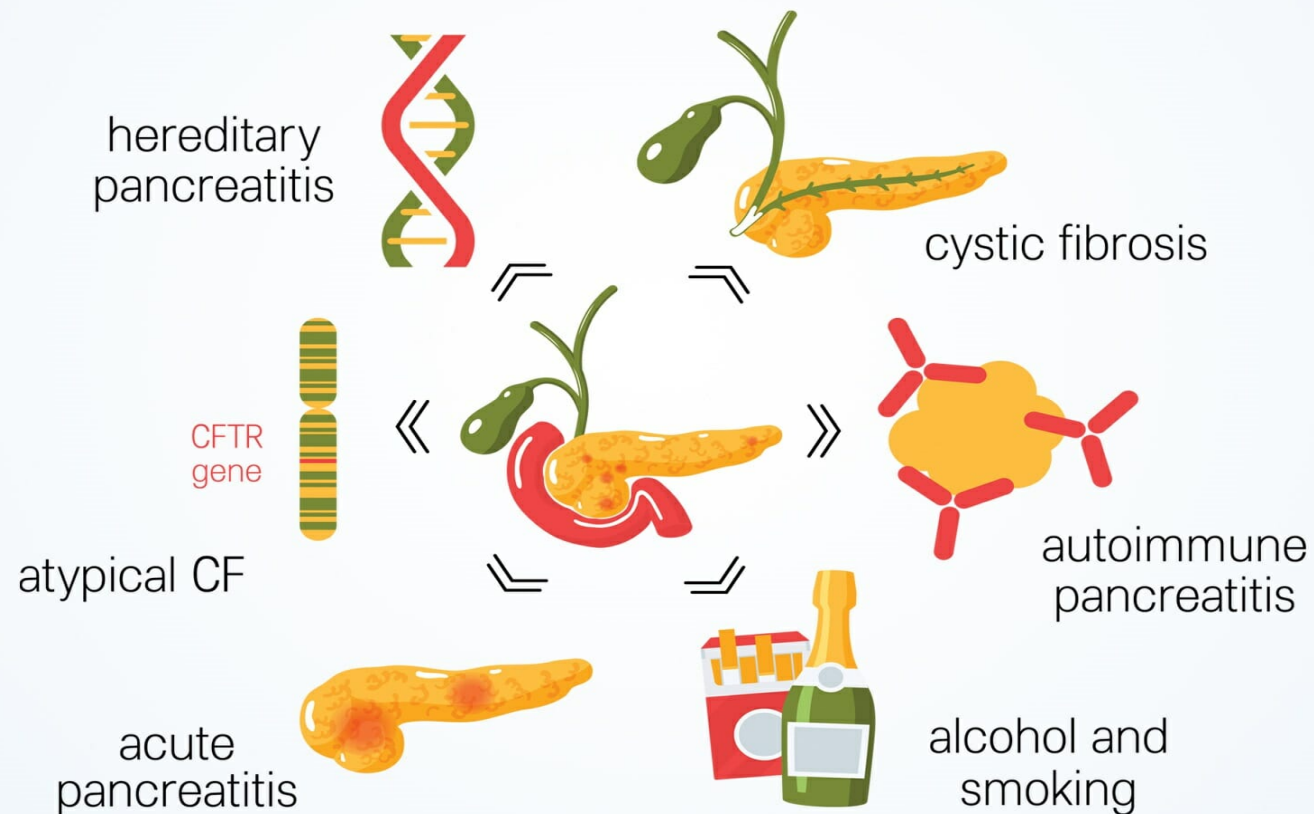
- Chronic pancreatitis (CP) may lead to intractable pain, opioid dependence, exocrine and endocrine insufficiency and diabetes.
- Total Pancreatectomy (TP) with Islet Autotransplantation (TP-IAT) can relieve pain and allowing to achieve glycemic control superior to TP only procedure, with insulin-independence in selected patients.
- We evaluated outcomes of TP-IAT performed in our center since 2014.



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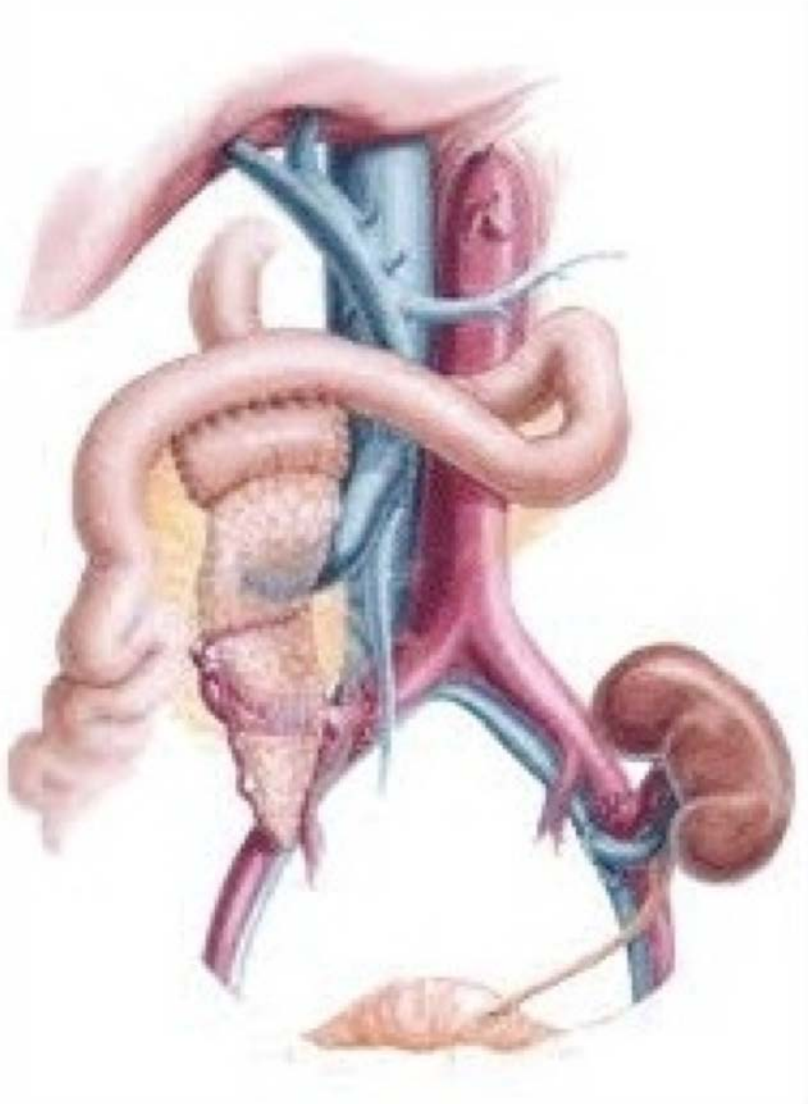
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CHRONIC PANCREATITIS CAUSES



CP is associated with genetic mutations (PRSS, CFTR, SPINK1)
-especially resistant to medical therapy

Pancreas Transplantation

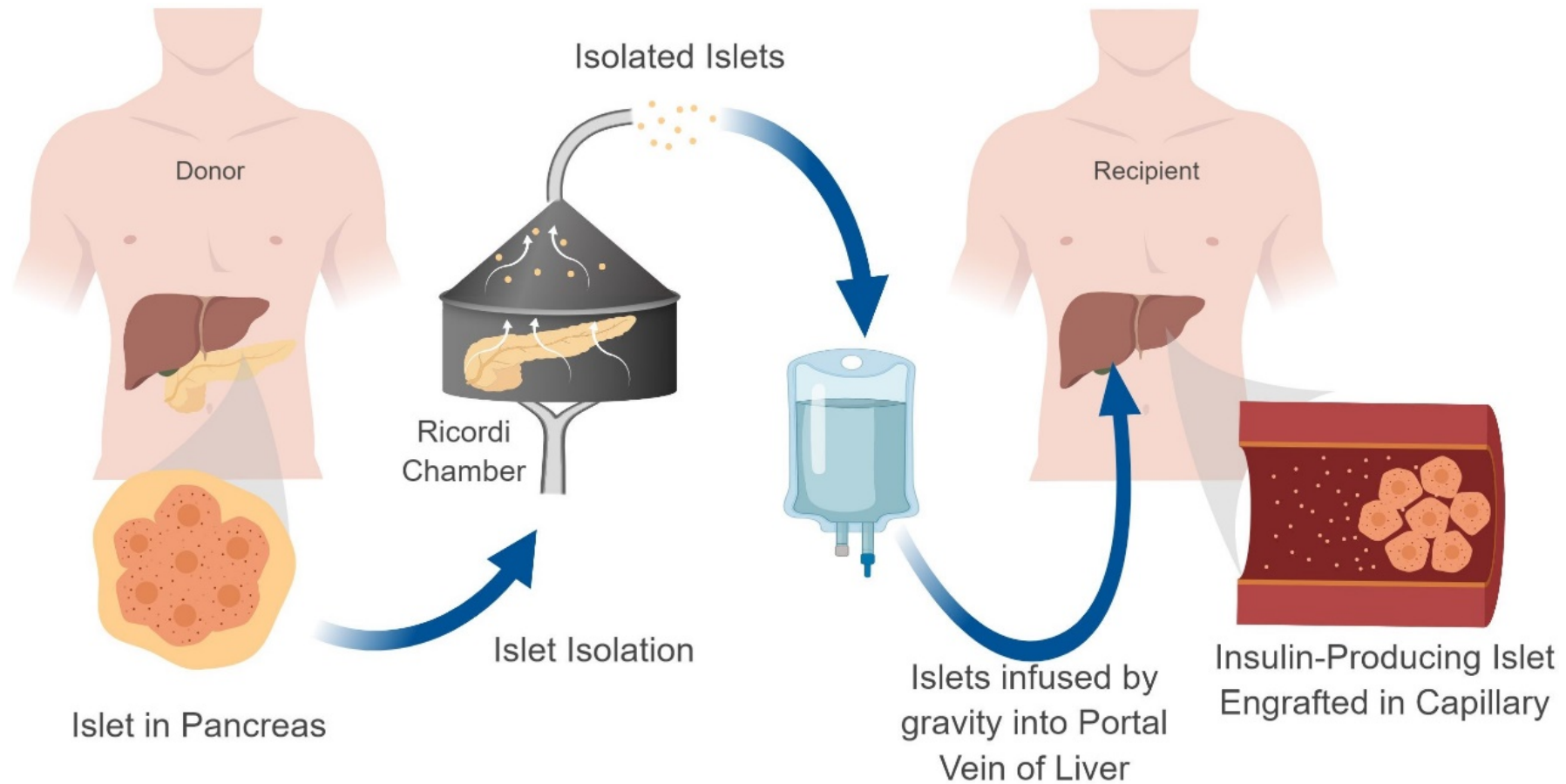


- Restores endogenous insulin production and allows for freedom from insulin injections

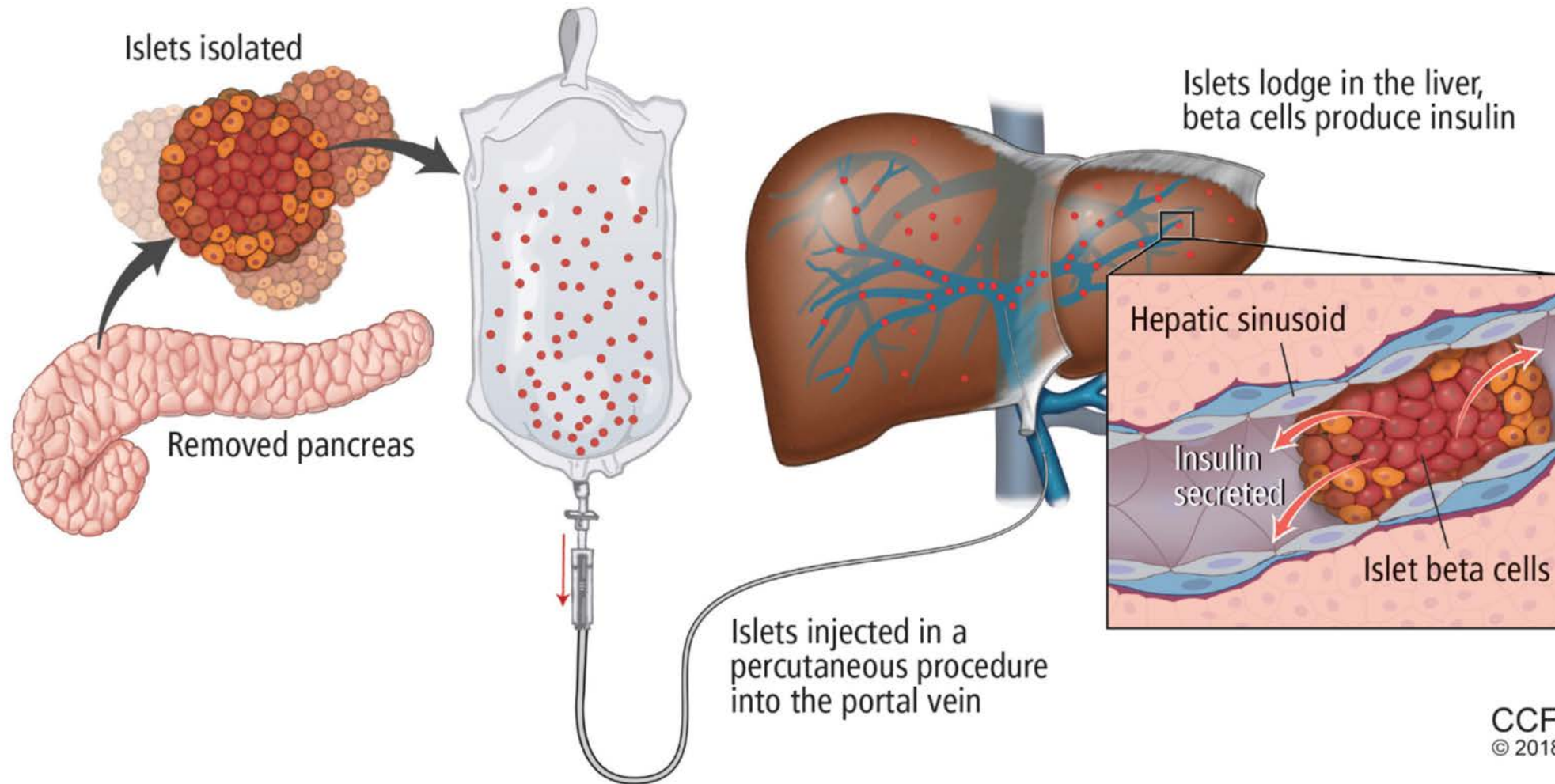
Disadvantages:

- Requires major surgery, ICU recovery
- Risk of pancreas loss (thrombosis) 10%
- Risk of re-operation 20-30% due to bleeding, bowel leak, infection
- Requires life-long immunosuppression with side effects

Islet Isolation- Ricordi's technique

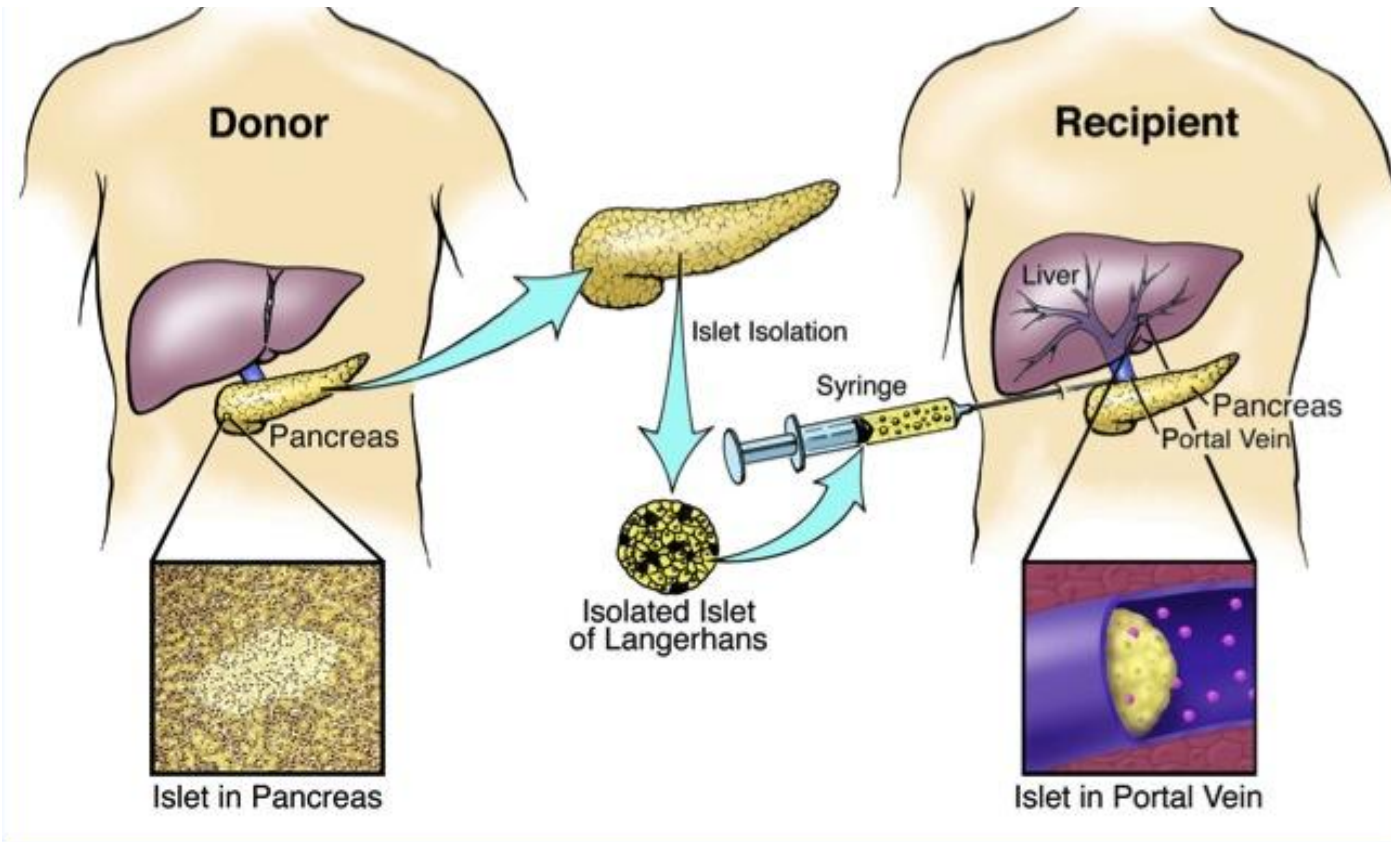


Total Pancreatectomy with Islet Autotransplantation



Islet Transplantation-

a minimally invasive alternative to the whole pancreas transplantation



Benefits

- Insulin independence
 - Optimal blood glucose control
 - Prevention of secondary diabetes complication
 - Improved quality of life
-
- Avoids major surgery related complications
 - Minimal risk of bleeding
 - No downside to the liver
-
- Requires life-long immunosuppression with side effects

Methods

- We retrospectively reviewed 42 patients who underwent TP-IAT using a prospectively-maintained database and IRB-approved protocol.
- Variables included age, BMI, islet yield, opioid use, blood glucose control based on HbA1c and insulin use.
- Islet purification was implemented in 4 (10%) cases to reduce islet pellet volume below 20 mL for intraportal infusion.

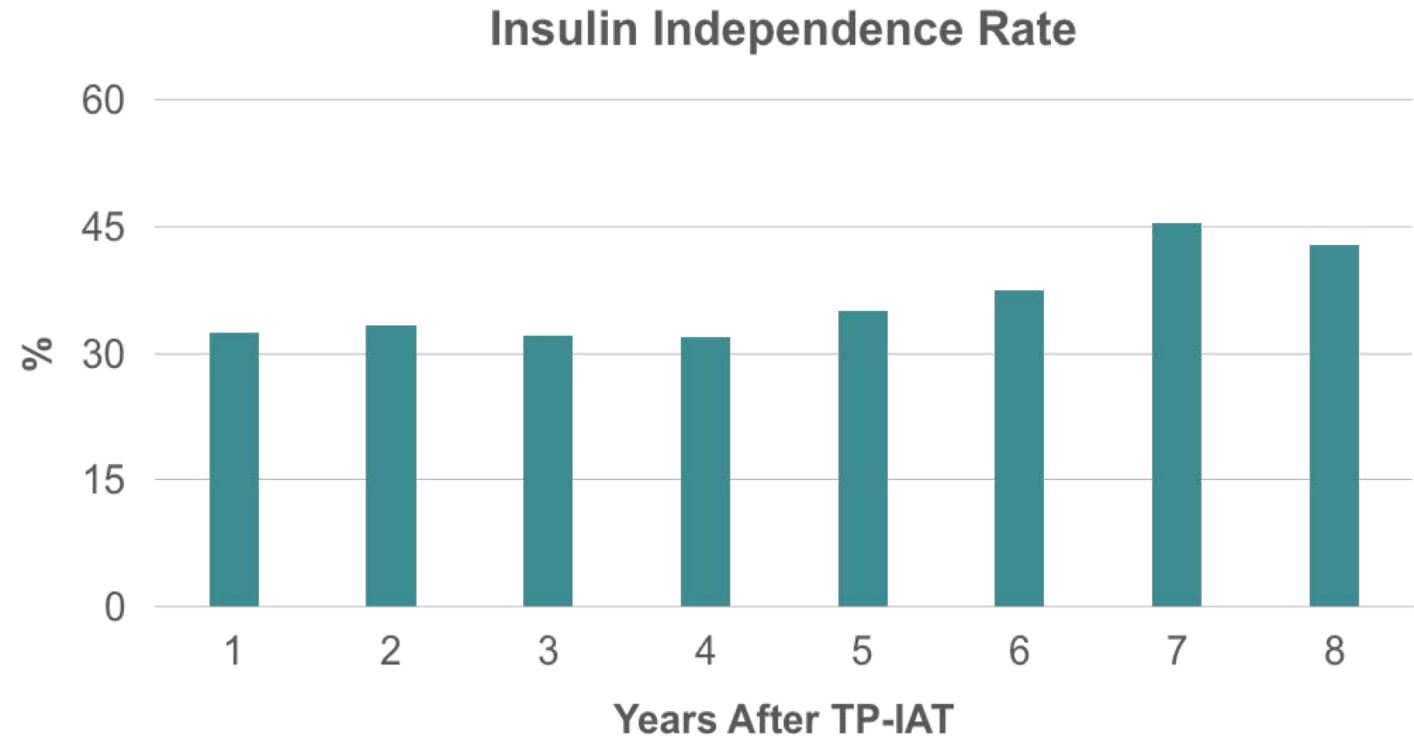
Results

- **N=42** ,15 M and 27 F
- median age: **33 (6-65)**
- median BMI: **25 (17-39)**.
- N=9 (21%) followed over 8 years.
- All patients (N=42) required opioids prior to the TP-IAT.
- Complete resolution of abdominal pain and need for opioid therapy were confirmed in **70-80%** of patients and this rate was maintained during the follow up.



Results (Continued)

- Islet mass: $211,000 \pm 111,000$ islet equivalents (IEQ), $2,500 \pm 1,600$ IEQ/kg.
- N=29 (69%) were non-diabetic,
- N=8 (19%) were pre-diabetic ($5.7 < \text{HbA1c} < 6.5$)
- N=5 (12%) diabetic prior to the TP-IAT.
- None of the diabetic and pre-diabetic ($\text{HbA1c} > 5.7$) achieved insulin independence
- Majority (12/13) presented persistent islet graft function (positive serum c-peptide) after the TP-IAT.
- During the follow up, Insulin independence was maintained in **33-45% of non-diabetic patients**.



Summary

- Complete resolution of pancreatic pain and opioid use were documented in 70-80% of patients during 8 year follow up.
- None of patients with HbA1c >5.7 or diabetic prior to TP-IAT achieved insulin independence after the procedure.
- Insulin independence rate among non diabetic patients with HbA1c <5.7 was 32-45% and stable in 8 year follow up.

Conclusions

Total Pancreatectomy (TP)

- Successfully provided pancreatic pain resolution with no perioperative mortality.

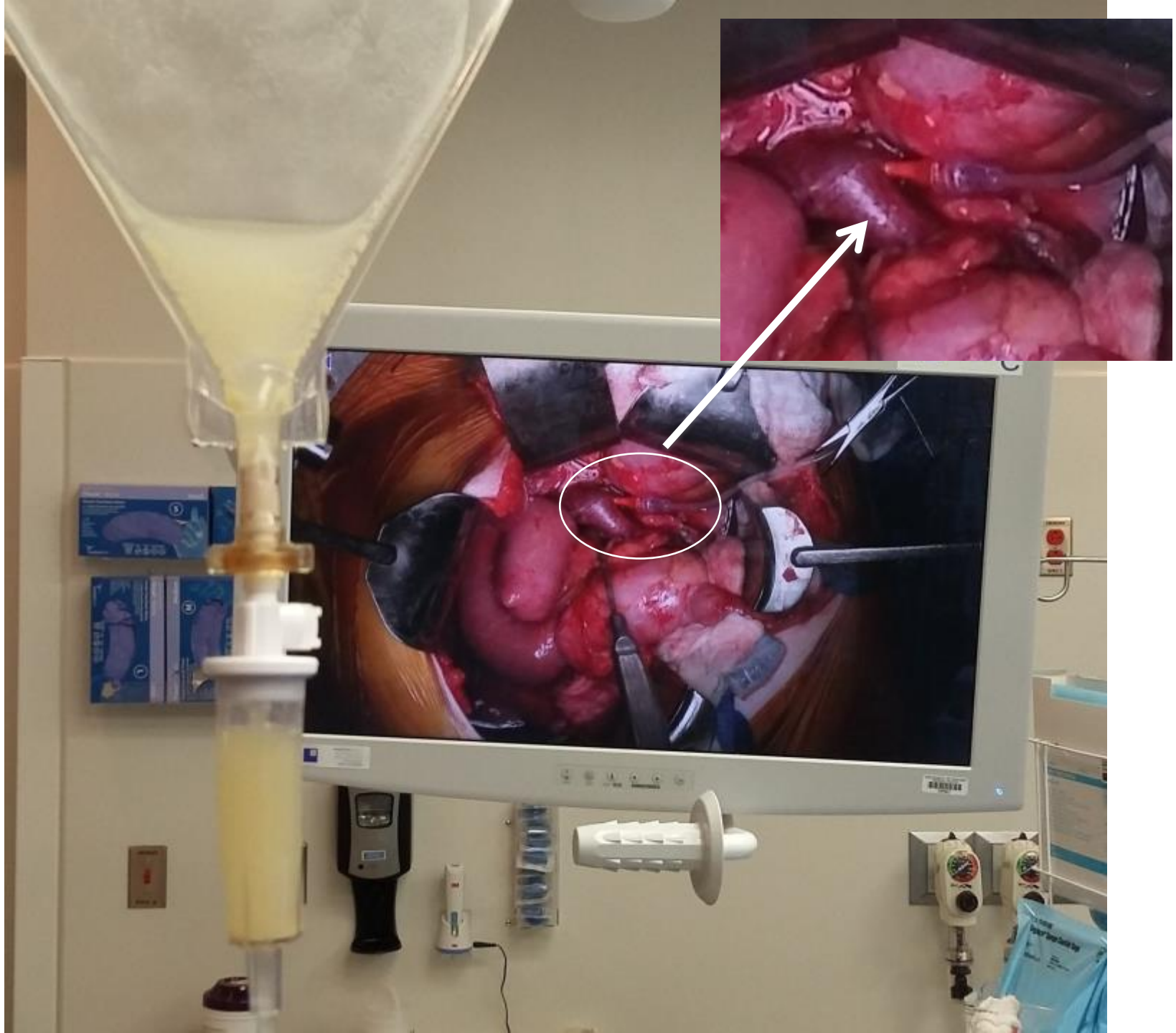
Islet Autotransplantation (IAT)

- Allowed for preservation of the endocrine beta cell function in majority of the patients (41/42= 98%).
- Prevented diabetes in over 1/3 of the non-diabetic patients.

**Diabetes and pre-diabetes always resulted in diabetes after TP-IAT*

Reference

- Our publications <https://www.pwitkowski.org/islet-auto-publication>
- Our patient stories <https://www.pwitkowski.org/islet-auto-patientstories>
- General info <https://www.pwitkowski.org/tpiat>
- Patient referral Lindsay Basto Lindsay.Basto@bsd.uchicago.edu





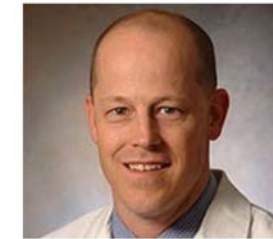
PANCREATIC ISLETS AUTOTRANSPLANTATION SEVERE CHRONIC PANCREATITIS

Surgeons

Excision of the entire pancreas (pancreatectomy) and new connections between liver, stomach and bowels (reconstruction of the gastrointestinal tract) are performed by a hepatobiliary surgeon **Dr. Jeffrey Matthews** in adults, and by **Dr. Mark Sidel** in children (click on their pictures to get contact information).
Dr. Witkowski joins the operation to prepare the pancreas for processing, supervises the process of islet isolation and assists during the islet infusion procedure.
Dr. Ruba Azzam is a **pediatrics gastroenterologist** optimizing medical care in pediatric patients before and after surgery.



Jeffrey Matthews MD FACS
Surgeon-In-Chief, Department of Surgery



Mark Sidel, MD, MPH
Pediatric Surgeon

STUDIES

PUBLICATIONS

PATIENTS STORIES



Luke

A natural athlete 10 years old

Luke missed a lot of school days due to recurrent pain in his belly. Could not travel and play in his soccer team. Few months after surgery, he was back pain-free with his teammates.



Justin and baseball

16 years old

Justin missed a lot of school days, could not travel and play in his baseball team because of recurrent severe belly pain and frequent trips to the ERs.



Ruba Azzam M.D.
Pediatric Gastroenterologist



Piotr Witkowski M.D. Ph.D.
Transplant Surgeon