

Outcomes of Total Pancreatectomy with Islet Autotransplantation in Hereditary Chronic Pancreatitis: A Single-Centre UK Experience

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Introduction

Chronic pancreatitis (CP) is a progressive fibro-inflammatory disorder that leads to intractable pain, exocrine insufficiency, and diabetes. Hereditary chronic pancreatitis (HCP), most commonly caused by PRSS1, SPINK1, and CFTR mutations, presents early in life, is associated with prolonged disease duration, and carries a ~40% lifetime risk of pancreatic cancer. Pain is often severe and refractory to medical or endoscopic treatment, profoundly affecting quality of life.

Total pancreatectomy with islet autotransplantation (TPIAT) provides definitive pain relief by removing the diseased gland while reinfusing autologous islets to preserve endocrine function. Although outcomes are favourable, HCP poses unique challenges due to extensive fibrosis and reduced islet yield, limiting insulin independence. Earlier intervention may preserve islet mass and mitigate malignancy risk.

This study assesses the perioperative, metabolic, and functional outcomes of TPIAT in hereditary CP patients treated at a single UK specialist centre.

Objectives

This study aims to evaluate the perioperative, metabolic, and functional outcomes of Total Pancreatectomy with Islet Autotransplantation (TPIAT) in patients with hereditary chronic pancreatitis (HCP) managed at a single UK specialist centre. Specifically, it seeks to characterise patient demographics, operative parameters, and postoperative recovery in this unique cohort, while assessing islet yield, viability, insulin independence, and pain outcomes following surgery.

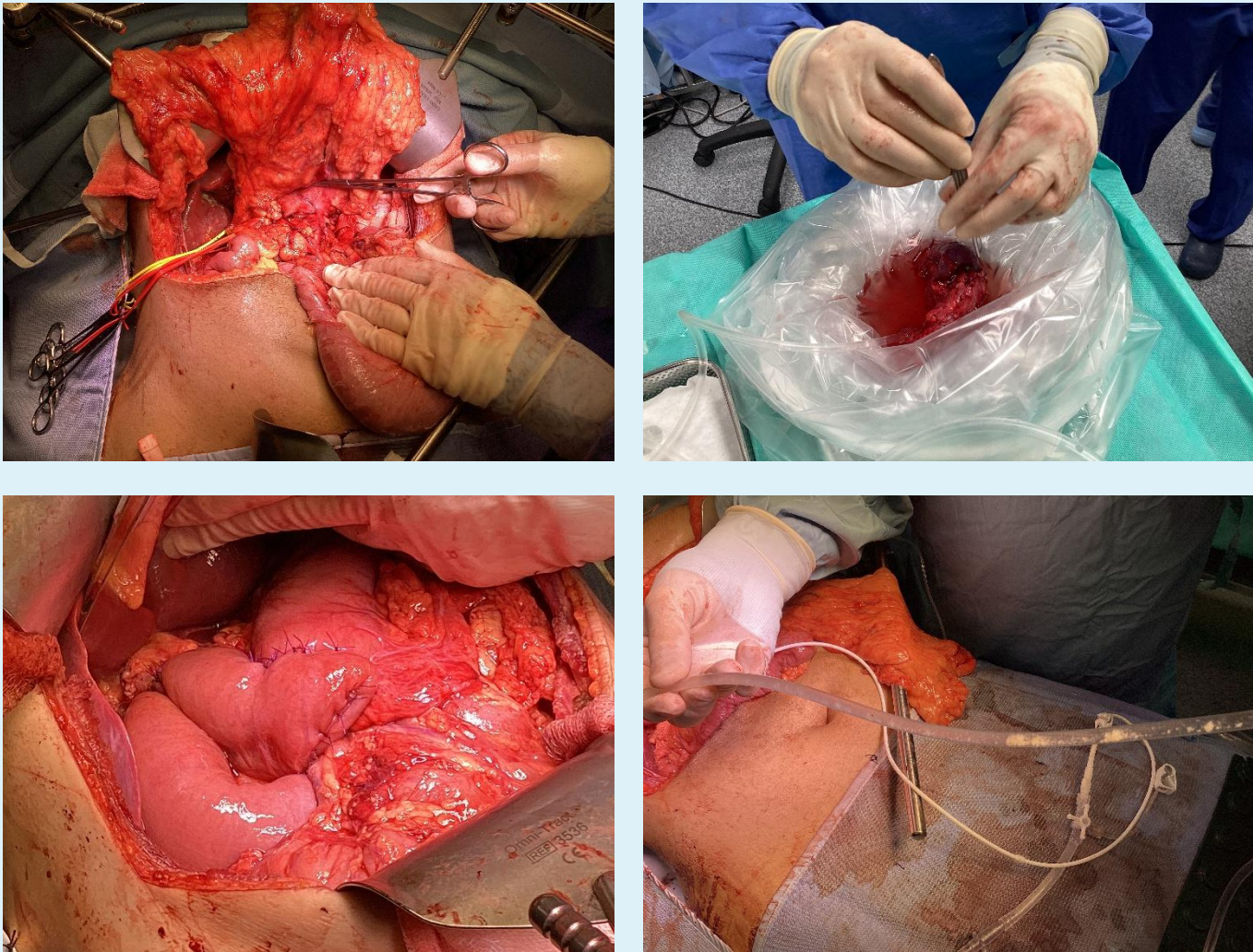
Additionally, the study explores how disease duration, pancreatic fibrosis, and early surgical referral may influence metabolic function and long-term quality of life. Through this analysis, we aim to identify factors that optimise outcomes and support earlier consideration of TPIAT to preserve islet mass and mitigate pancreatic cancer risk in hereditary CP.

Methodology

A retrospective review was conducted of all patients with hereditary chronic pancreatitis (HCP) who underwent Total Pancreatectomy with Islet Autotransplantation (TPIAT) at a single UK tertiary hepatopancreatobiliary (HPB) centre between 2021 and 2024.

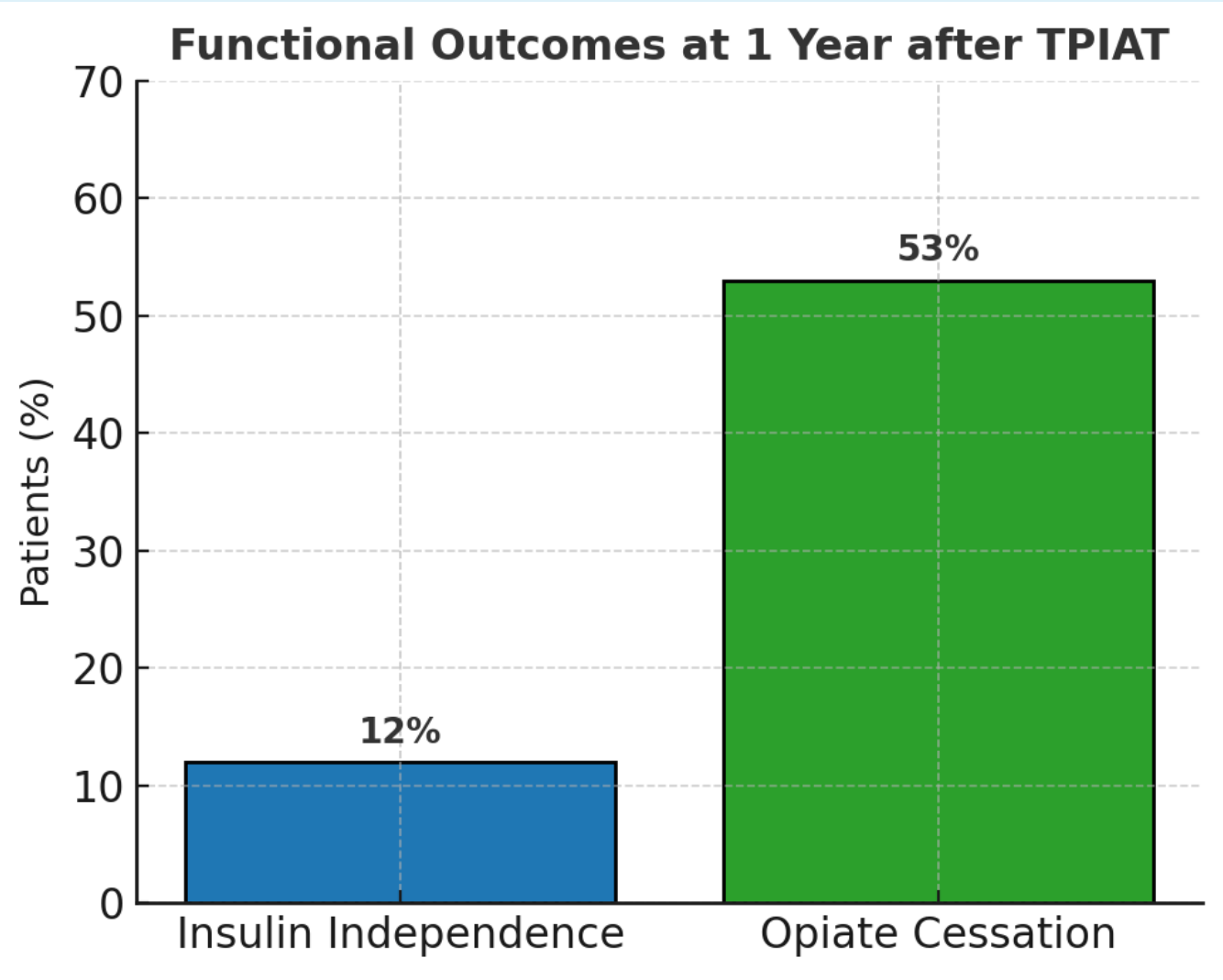
All patients had genetically confirmed HCP based on accredited testing for PRSS1, SPINK1, and CFTR mutations. Demographic, clinical, operative, and metabolic data were retrieved from a prospectively maintained database and electronic medical records. Preoperative evaluation included endocrine and exocrine function testing, cross-sectional imaging, and multidisciplinary team (MDT) review involving surgeons, diabetologists, gastroenterologists, pain specialists, and psychologists.

Operative parameters (duration, blood loss, islet yield, and viability) and postoperative outcomes (complications, hospital stay, and mortality) were assessed. Functional and metabolic outcomes, including insulin independence and opioid cessation at one year, were also evaluated to determine recovery and long-term benefit following TPIAT.



Results

Parameter	Median (IQR) / n (%)	Key Findings
Age (years)	30 (21 – 41)	Younger patient cohort
Disease duration (months)	108 (87 – 123)	Long-standing disease
Operative duration (minutes)	657 (645 – 681)	Technically complex procedure
Estimated blood loss (ml)	500 (250 – 1650)	Controlled intraoperative bleeding
Clavien Dindo ≥ III complications	0 (0%)	No mayor complications
Mortality	0 (0%)	No perioperative deaths
Hospital stay (days)	15 (14 – 20)	Shorter postoperative recovery
Islet yield (IEQ)	48,070 (20,392 – 107,466)	Reflects pancreatic fibrosis
Islet viability (%)	90 (85 – 96)	High-quality islet isolation
Insulin independence at 1 year	12%	Limited by low islet yield
Opiate cessation at 1 year	53%	Significant pain improvement



Conclusions

Patients with HCP undergoing TPIAT are typically younger and physiologically robust, contributing to favourable perioperative recovery and an absence of major complications. Despite the technical complexity of surgery and lower islet yields due to advanced pancreatic fibrosis, meaningful pain relief and acceptable metabolic stability can still be achieved.

Over half of patients discontinued opioid use within one year, reflecting significant improvement in quality of life, while a subset achieved partial insulin independence. These findings suggest that earlier referral for TPIAT, before irreversible fibrosis develops, may optimise islet preservation and metabolic outcomes. TPIAT remains a safe and effective option for selected HCP patients when undertaken in experienced specialist centres.

Key Messages

- TPIAT offers durable pain relief and improves quality of life in HCP
- Younger age and early intervention are associated with smoother recovery and potential metabolic benefits.
- Islet yield is limited by prolonged disease duration and fibrosis, underscoring the value of timely surgery.
- No major complications or mortality were observed, confirming the procedure's safety in this cohort.

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