

ORIGINAL ARTICLE

Results of decompression surgery for pain in chronic pancreatitis

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*Clinical and Surgical Sciences (Surgery), Edinburgh Royal Infirmary, Edinburgh, UK***Abstract**

Introduction. A vast majority of patients with chronic pancreatitis require regular opiate/opioid analgesia and recurrent hospital admission for pain. However, the role and timing of operative strategies for pain in chronic pancreatitis is controversial. This study hypothesized that pancreatic decompression surgery reduces analgesia requirement and hospital readmission for pain in selected patients. **Patients and methods.** This was a retrospective review of patients undergoing longitudinal pancreatico-jejunostomy (LPJ), with or without coring of the pancreatic head (Frey's procedure), between 1995 and 2007 in a single UK centre. Surgery was performed for chronic pain with clinical/radiological evidence of chronic pancreatitis amenable to decompression/head coring. **Results.** Fifty patients were identified. Thirty-six were male with a median age of 46 years and median follow-up of 30 months. Twenty-eight underwent LPJ and 22 underwent Frey's procedure. No significant difference in reduction of analgesia requirement (71% vs 64%, $p=0.761$) or hospital readmission for pain (21% vs 23%, $p=1.000$) was observed when comparing LPJ and Frey's procedure. Patients were significantly more likely to be pain-free following surgery if they required non-opiate rather than opiate analgesia preoperatively (75% vs 19%, $p=0.0002$). Fewer patients required subsequent hospital readmission for pain if taking non-opiate rather than opiate analgesia preoperatively (12.5% vs 31%, $p=0.175$). **Conclusions.** In selected patients, LPJ and Frey's procedure have equivalent benefit in short-term pain reduction. Patients should be selected for surgery before the commencement of opiate analgesia.

Key Words: *Decompression, surgery, pancreatitis, pain***Introduction**

Chronic pancreatitis is characterized by a varied and unpredictable clinical course culminating in profound endocrine and exocrine gland dysfunction [1]. Persistent and intractable pain is the principal clinical feature in approximately 90% of patients and has perhaps the greatest detrimental impact on quality of life [1,2]. Surgical intervention is indicated for complications of chronic pancreatitis (including pseudocyst formation, biliary obstruction and duodenal obstruction) and in carefully selected patients is beneficial in reducing pain [3,4].

Surgical intervention is based on two current theories on the aetiology of pain in chronic pancreatitis: perineural inflammation and fibrosis leading to a mass lesion in the head of the pancreas prompted treatment by resectional surgery (e.g. Whipple's or Beger's procedure), while the ductal hypertension theory led to the introduction of pancreatic duct drainage procedures and principally involve the modified Puestow

longitudinal pancreatico-jejunostomy (LPJ) established by Partington and Rochelle [5]. Frey has attempted to unite the benefits of pancreatic head resection and LPJ by establishing a hybrid of these procedures where duct decompression is combined with subtotal coring of the pancreatic head [6,7]. Preliminary data indicate that this procedure performs favourably in terms of pain reduction and preservation of pancreatic function, at least in the short term [6,8–11]. While a number of studies have compared resectional with drainage procedures, there has been no comparison of Frey's procedure with LPJ.

Although many studies have shown the efficacy of surgery in treating the pain of chronic pancreatitis, the timing of surgery and the choice of procedure are controversial. Some advocate surgery only when medical management has failed and pain has become unresponsive to other therapies [1]. Given that many of the problems surrounding the deterioration in quality of life in those suffering with painful chronic

pancreatitis stem from opiate dependence, there may be a strong case for early surgery before the requirement for opiate analgesia. Furthermore, some studies present little information on pancreatic morphology before treatment, despite the recognition that tailoring surgery towards gland pathology plays an important role in pain reduction [3].

The aim of the study was to examine outcomes after pain-relieving surgery for chronic pancreatitis and compare results for LPJ vs Frey's procedure.

Patients and methods

A review of data from the prospectively collected Lothian Surgical Audit was performed for all patients who underwent LPJ or Frey's procedure for chronic pancreatitis over an 11-year period between 1995 and 2006 at the Royal Infirmary of Edinburgh. Patients found to have unsuspected pancreatic malignancy at surgery were excluded.

Patients with characteristic abdominal pain from chronic pancreatitis requiring regular analgesia were considered for surgery if there was radiological (ERCP and/or CT imaging) evidence of pancreatic duct dilatation. Early in the study period, cases were treated mainly with LPJ, while Frey's procedure was introduced from 1998 and performed where enlargement and fibrosis of the head of the gland was demonstrable radiologically and/or intraoperatively, with or without the presence of a sentinel stone in the proximal portion of the main pancreatic duct. In cases where alcohol was the suspected aetiology, patients were only considered for surgery if there was convincing evidence of complete abstinence.

Pain was assessed by recording the immediate preoperative and last known analgesia requirements categorized as opiate, non-opiate or nil. A requirement for opiate analgesia was defined as the regular use of morphine sulfate, oromorph and fentanyl patches, either alone or in combination, while a requirement for non-opiate analgesia was defined as the regular use of tramadol, dihydrocodeine, non-steroidal anti-inflammatory drugs (NSAIDs), paracetamol, or combinations of these drugs. A reduction in analgesia was defined in terms of analgesia category, i.e. from opiate to non-opiate/no analgesia or from non-opiate to no analgesia. Pain was also assessed by quantifying readmissions to hospital for pain control. Follow-up information was supplemented by case note review and by contacting general practitioners by telephone.

Results

A total of 50 patients (36 males, 14 females) underwent pancreatic decompression surgery during the study period. The median age was 46 years (range 23–74 years). Twenty-eight (56%) patients underwent LPJ alone and 22 (44%) underwent Frey's

procedure. The median follow-up duration was 36 months (range 1–141 months): 42 months (range 1–141 months) for LPJ and 33 months (range 2–84 months) for Frey's procedure. The 30-day mortality rate was 4% (one patient died following a post-operative myocardial infarction, one patient sustained Roux-limb infarction leading to sepsis, multi-organ failure and death). There were four (8%) operative complications in four patients (one intraoperative splenectomy following a capsular tear and bleeding, one postoperative anastomotic leak managed conservatively and two incisional hernias).

Analgesia before and after surgery is summarized in Table I. Of patients requiring opiates preoperatively, only 5 of 26 (19%) were rendered pain-free after surgery (i.e. no regular analgesia), whereas 18 of 24 (75%) patients who required non-opiate analgesia before surgery became pain-free ($p=0.0002$). However, a reduction in analgesia requirement was achieved in 16 of 26 patients (62%) requiring preoperative opiates compared to 18 of 24 (75%) requiring non-opiates ($p=0.372$).

There was no significant difference in reducing analgesia requirements when the two surgical procedures were compared: 20 of 28 patients (71%) who underwent LPJ achieved a reduction in analgesia requirement compared to 14 of 22 patients who underwent Frey's procedure ($p=0.761$).

Eleven patients (22%) who underwent surgery required readmission to hospital for management of pancreatic pain. Of the 26 patients requiring opiate analgesia before surgery, 8 (31%) required hospital readmission for the management of pain compared with only 3 of 24 patients (12.5%) requiring non-opiate analgesia before surgery ($p=0.175$). There was no significant difference in readmission rates between the two procedures: 5 (23%) patients who underwent Frey's procedure compared with 6 (21%) in those who underwent LPJ ($p=1.000$).

Discussion

This study examined a single tertiary referral centre experience of surgery for pain in chronic pancreatitis over an 11-year period. The results presented show that 80% of patients achieved a reduction in category of analgesia requirements after surgery, regardless of whether opiate or non-opiate analgesia was used preoperatively. Assessed on a non-categorical basis, analgesia requirement was reduced in 46 of 50 patients (92%), unchanged in 2 patients (4%) and increased in 2 patients (4%). Furthermore, 78% of patients required no further chronic pain-related admissions to hospital after surgery.

There is a view that surgery for pain in chronic pancreatitis should be reserved for those patients in whom conservative management in the form of increasing levels of analgesia has failed [1–3]. However, there are few data examining the optimum

Table I. Analgesia by category (opiate/non-opiate/nil) before and after surgery for chronic pancreatitis according to type of procedure (percentages are shown as a value of each total).

Analgesia	LPJ (<i>n</i> =28)		Frey's procedure (<i>n</i> =22)	
	Preoperative	Postoperative	Preoperative	Postoperative
Opiate	15 (54%)	4 (14%)	11 (50%)	6 (27%)
Non-opiate	13 (46%)	11 (39%)	11 (50%)	6 (27%)
Nil	0	13 (47%)	0	10 (45%)

timing for pain-related surgery in chronic pancreatitis [4]. The current study demonstrates that patients requiring preoperative non-opiate analgesia were far more likely to become pain-free after surgery compared with those taking opiates. Furthermore, patients taking non-opiate medication before surgery had a lower likelihood of pain-related admission to hospital after surgery compared with those requiring regular opiate analgesia preoperatively. Nevertheless, patients who required opiate analgesia preoperatively did benefit from reduction in analgesia requirements after surgery, suggesting that preoperative opiate medication is not in itself a contraindication to surgery. Overall, however, these data support the view that referral for pain-relieving surgery in chronic pancreatitis should be undertaken early in the course of the disease [4], where gland abnormalities amenable to surgery might be identified, preventing progression onto opiate analgesia and the associated degradation in quality of life.

There were no significant differences in pain reduction or pain-related hospital admissions when comparing the Frey and LPJ procedures. The data presented here compare favourably with short-term outcomes from previous studies examining the modified Puestow and Frey procedures, where pain reduction was achieved in 75–90% of patients following surgery [3,4,6,8–17]. In our institution the introduction of Frey's procedure has allowed comparison of pain-associated outcomes for a selected population with defined morphological abnormalities of the gland. This is important because most series do not discriminate between specific gland appearances when recommending surgical techniques, despite several authors commenting that optimal surgical approaches in treating chronic pancreatitis must be tailored to the pancreatic abnormalities observed before surgery [3].

In this study the median follow-up is relatively short at 36 months. Long-term efficacy of surgery for pain relief in chronic pancreatitis after LPJ may be as high as 50% at 5 years [6,7,12–15,17]. However, one proposed reason for the long-term failure of the LPJ procedure is that the modification described by Partington and Rochelle has not always been strictly adhered to by some surgeons [16]. Decompression of the main pancreatic duct for only short segments can significantly compromise subsequent relief from pain

[16,17]. All patients who underwent LPJ in the current study had decompression of the pancreatic duct carried completely into the pancreatic head, which is a critical component in the success of the procedure. It remains to be seen whether this alters pain recurrence in the longer term in this series.

In summary, Frey's procedure and LPJ can be performed with acceptable operative morbidity and mortality and have been shown elsewhere to be favourable in terms of gland function when compared with purely resectional approaches. Total withdrawal of analgesia is most likely when patients are offered these procedures before progression onto opiates, but benefit in terms of reduced analgesia requirement can still be achieved in this group. If patients are carefully selected for surgery to ensure that the chosen operation suits the pathological appearance of the gland, good results can be achieved with both procedures.

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