SCIENTIFIC ARTICLE

Distal pancreatectomy: comparison of open and laparoscopic techniques

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Abstract

Introduction

Distal pancreatectomy [DP] is the curative treatment for tumours of the body and tail of the pancreas. It may be with en-bloc splenectomy or spleen preserving. Latter is technically more challenging. The procedure may be performed by open surgery or by laparoscopy. We evaluated the outcomes in a cohort of patients comparing open surgery versus laparoscopy for D P.

Objective

Compare open surgery vs laparoscopy for DP

Method

A retrospective analysis of patients who underwent DP at a single surgical unit was done. The study period was from 2015 January to 2022 January.

Results

Thirteen patients underwent the procedure, eight by laparoscopy and four by open surgery while one had a conversion to open.

Conclusions

Distal pancreatectomy is feasible with laparoscopy and reduces postoperative morbidity. The blood loss is less and has cosmetic advantages, especially in young patients

Introduction

Distal pancreatectomy [DP] is the treatment for benign, premalignant, and malignant tumours in the body and tail of the pancreas. Resection of pancreatic tissue left to the Porto-mesenteric vein is performed in DP. This is with or without splenectomy.

The laparoscopic approach is used for many abdominal procedures since its initial use for cholecystectomy in 1987. However, laparoscopic pancreatic resections took time to develop due to the relative complexity of pancreatic anatomy, retroperitoneal location and vascular relations [1].

Laparoscopic distal pancreatectomy [LDP] was first described in 1994 and has recently been adopted by many centres. By performing DP laparoscopically morbidity is reduced allowing early discharge from the hospital [3][4][5].

Incidence of pancreatic fistula after distal pancreatectomy remains high. Other complications described are intra-abdominal abscesses, wound infections, problems of gastric emptying, ileus and haemorrhage [6].

A comparison of DP performed in our unit by open and laparoscopic techniques is presented in this article.

Method

A retrospective analysis of patients who underwent DP was done. The study period was from 2015 January to 2022 January.

The open surgeries were performed in the supine position using a subcostal incision. Division of the pancreas was by stapler. Laparoscopic resections were performed in the right lateral position and the head end was raised. Five ports were used. In cases where the spleen was preserved splenic supply was by preserving splenic artery and vein. Division of the pancreas was done using bipolar diathermy and ultrasonic dissector with stump unsutured. The resected specimen was retrieved after placing in a plastic bag.

Results

Thirteen patients underwent the procedure, eight by laparoscopy and four by open surgery. One had laparoscopy converted to open.

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Table 1. Laparoscopic distal pancreatectomy

Gender	Male	Female	Total
Number	6	2	8

Table 2. Open distal pancreatectomy

Gender	Male	Female	Total
Number	2	2	4

One female had a laparoscopy procedure converted to open due to lack of progress.

Eleven patients had a mass in the pancreatic body and/ or tail. In one, the indication was an aneurysm of the splenic artery. The other patient previously underwent excision of a left malignant pheochromocytoma. On follow-up PET-CT scan a possible recurrence of the pancreatic tail was demonstrated and oncologists requested a DP with splenectomy.

All open patients underwent splenectomy. In the laparoscopy group, two had spleen preserving DP.

The following tables show the duration of surgeries.

Table 3. Duration of surgery during open DP

Case no	1	2	3	4	Average
Duration[min]	240	200	180	180	200

Table 4. Duration of surgery during laparoscopic DP

Case no	1	2	3	4	5	6	7	8	Average
Duration[min]	180	160	160	220	180	160	230	150	180

The patient who had the conversion to open took 250 minutes.

The following tables show blood loss during surgery.

Table 5. Blood loss during open DP

Case no	1	2	3	4	Average
Blood loss[ml]	750	400	350	500	500

Table 6. Blood loss during laparoscopic DP

Case no	1	2	3	4	5	6	7	8	Average
Blood loss[ml]	100	150	75	75	100	100	125	75	100

Blood loss in the patient who underwent conversion was 1000ml.

All were managed with epidural and intermittent subcutaneous morphine during the first 24 hours in ICU.

Pain relief for patients who underwent laparoscopic DP after the first twenty-four hours was with diclofenac suppository and oral paracetamol/ codeine.

Pain relief for patients who underwent open DP required subcutaneous morphine for forty-eight to seventy-two hours and subsequently was managed with diclofenac sodium suppositories and oral paracetamol and codeine.

Patients who had laparoscopy converted to open had persistent drainage and the drain was left in situ for five weeks with high amylase levels in the draining fluid. In all others, the drain was removed by the fifth postoperative day. Two in the open surgery group had minor superficial wound infections.

Patients after open surgery were discharged within seven to fourteen days.

Table 7. Histopathology

Histopathology	Number
Adenocarcinoma	3
Solid pseudopapillary neoplasm	4
Mucinous cystic neoplasm	2
Serous cystadenoma	2
Suppurative granulomatous reaction	1
Pseudo-aneurysm of splenic artery	1
Total	13

The suppurative granulomatous reaction was seen in the patient who previously underwent excision of left malignant pheochromocytoma

Discussion

The incidence of malignancies in the body and tail of the pancreas is low compared to that of the head. A 10-year study, from 2001–2010, with data from the National cancer registry in Sri Lanka, records 880 patients with pancreatic cancer.

Out of these patients, for individuals where data was available, the site of malignancy included, 2.7% for the body and 4.0% for the tail of the pancreas [2]. This data explains the low numbers in our study, despite our unit being a referral centre.

The standard treatment of tumours of the body and/ or tail of the pancreas is distal pancreatectomy. This may be with or without splenectomy. Spleen preserving splenectomy may be by preserving the splenic artery and vein or by preserving the short gastric vessels [2] . The technique used in the two patients who had spleen-preserving DP in our study was the former technique.

Distal pancreatectomy [DP] is the curative treatment for benign, premalignant, and malignant tumours located in the body and tail of the pancreas.

In this study group, eleven patients had a mass in the pancreatic body and/ or tail. In one, the indication was an

aneurysm of the splenic artery. The other patient previously underwent excision of a left malignant pheochromocytoma. On a follow-up PET-CT scan a possible recurrence of the pancreatic tail was demonstrated and oncologists requested a DP with splenectomy.

The duration of surgeries is slightly higher in the open group. In the laparoscopy group, one reason for shorter operating time is the time saved for opening and closing. The blood loss was less in the laparoscopy group which was statistically significant according to independent samples t-test.

One patient had a conversion to open surgery due to lack of progress and the tumour infiltrating posteriorly.

In both groups, oral feeding was commenced on the first postoperative day. The analgesic requirement was less in the laparoscopy group.

The standard technique is to use staplers to divide the pancreas. The alternative is to suture the pancreatic stump after division by diathermy [6][7]. These techniques were used in an open surgery group. Patients who underwent laparoscopic resection had a division of the pancreas by bipolar diathermy and ultrasonic dissector. A close magnified look with the camera at the divided stump showed evidence of secure sealing. We decided not to re-inforce with sutures as it may simply cut through. Pancreatic fistula rate is about 4 to 69% after DP according to literature [7] .

One patient in this group developed a pancreatic fistula. This was the patient who had a conversion to open surgery in which the pancreatic stump was sutured. The histopathology was adenocarcinoma with a positive resection margin. The fistula healed spontaneously after five weeks.

The analgesic requirement was less in the laparoscopy group and discharged was earlier than open patients. The wound size was significantly smaller in the laparoscopy group.

All the tumours had free resection margins ensuring oncological safety. There is no clear evidence about the cost-effectiveness of LDP compared to open DP for pancreatic tumours [8]. We have not assessed this factor in our study. However other advantages discussed for the patients presented support to pursue on laparoscopic approach for distal pancreatectomy.

Conclusions

Distal pancreatectomy with or without splenectomy can be safely performed by laparoscopy. Division of pancreas by bipolar diathermy and ultrasonic dissector without suturing the stump did not lead to any complications. Per operative blood loss and postoperative morbidity of the laparoscopy group were less. All in the laparoscopy group were discharged by the sixth postoperative day.

All authors disclose no conflict of interest. The study was conducted in accordance with the ethical standards of the relevant institutional or national ethics committee and the Helsinki Declaration of 1975, as revised in 2000.

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