

The sequential surgical path to the first laparoscopic resection with Mini- laparotomy anastomosis for pancreatico-duodenectomy (Whipple's) in Sri Lanka

Galketiya KB, FRCS(Edin)¹, Pinto V, FRCA ,FCARCSI²

¹Consultant Surgeon, Teaching Hospital, Peradeniya, Sri Lanka

²Consultant Anaesthetist Teaching Hospital, Peradeniya, Sri Lanka

Abstract- OBJECTIVE To map out the path way from open pancreatico duodenectomy to complete laparoscopic resection detailing the situations which necessitated conversion to the open surgery at different stages of the procedure.

SUMMARY BACKGROUND DATA

Laparoscopic assisted pancreatico-duodenectomy is an achievable alternative to open surgery which necessitates a steep, stepwise learning curve. The usefulness and progression to laparoscopic resection with hand assisted or hybrid adaptations has been reviewed¹

METHOD

Open pancreatico duodenectomy was modified to complete laparoscopic surgery via a series of hybrid surgeries converting to open surgery at varying stages of the procedure. The Adaptation made and the stage at which conversion to open surgery was noted with the resultant success and complications

RESULTS

Twenty eight patients underwent surgery over two years. In 10 patients laparoscopic mobilization was possible until exposure of the portal vein .It was progressed to supraduodenal dissection in 11 patients and division of stomach and pancreas in 3. Complete resection was achieved in 4 patients. One patient developed pneumonia on the seventh post-operative day and succumbed eight days later. Other patients were discharged eight to ten days following surgery. Postoperative complications were minimal in all patients and none had anastomotic leaks or prolonged ileus. All pathological specimens revealed clear resection margins.

CONCLUSION

Laparoscopic pancreaticob duodenectomy poses a steep and challenging learning curve. Conversion to open surgery at varying stages of the procedure provides the confidence and improvement of the skills until successful completion.

I. INTRODUCTION

Pancreatico-duodenectomy is the surgical treatment of choice for carcinoma of the peri ampullary region and head of pancreas. The open procedure is associated with considerable morbidity and occasional mortality. The long incision, continuous handling and prolonged use of retractors can result in post operative respiratory inadequacy due to severe pain and ileus. There is

often significant blood loss. Laparoscopic assisted pancreatico-duodenectomy is an achievable alternative minimizing post-operative complications, thus facilitating early feeding, mobilization and discharge from hospital. .(1,2,4,6).

Laparoscopic laparoscopic pancreatico-duodenectomy necessitates a steep, stepwise learning curve and literature indicates the need of further studies to recommend its routine use.(4,5,6,7,8)

We describe the sequential progression adopted by us detailing the situations that necessitated conversion to open surgery at differing stages of the procedure until successful completion.

Patients were clinically evaluated for associated comorbidities and optimized as required. Procedures were carried out under general anaesthesia supplemented by epidural analgesia. Patients were positioned head up (30degrees) and a left sided tilt of 20 degrees.

Abducting the legs to 60 degrees enabled positioning of the surgeon closer to the surgical field.

The laparoscopic screen was placed over the right shoulder. And was adjusted to provide a clearer vision.

We used five ports. Pneumoperitoneum was created by insufflation of CO2 at a pressure of 14 mmHg. The gastro-colic ligament was divided to enter the lesser sac. Colon was mobilized from the mid transverse colon to caecum. The duodenum was identified and 'kocherized' and the inferior vena cava was exposed until the left renal vein crossed the abdominal aorta. Duodenal mobilization was continued until division of the ligament of Treitz

Subsequently the portal vein was exposed to the neck of pancreas. Dissection continued until the common bile duct and common hepatic artery were exposed.. This was followed by clipping and division of the gastro-duodenal artery. Stomach was transected using staplers and the pancreas was divided in front of the portal vein. The jejunum was transected using staplers.

The gall bladder was separated from the liver bed and division of the common hepatic duct completed the resection.

A mid line laparotomy of not exceeding 10 cm was adequate to retrieve the specimen and perform the anastomoses - pancreaticojejunostomy, hepatico-jejunostomy and gastro-jejunostomy

Twenty eight patients underwent surgery over two years. In 10 patients laparoscopic mobilization was possible until exposure of the portal vein .It was progressed to supraduodenal dissection in 11 patients and division of stomach and pancreas in 3.

Complete resection was achieved in 4 patients. Blood loss never exceeded 500ml during all laparoscopic procedures of varying extent.(Table 1)

The meticulous fluid balance, monitoring and vigilance reduced complications due to altered physiology owing to pneumoperitonium, position, abdominal compartment syndrome with aorto-caval compression leading to impediment of perfusion to organs, possibility of gas embolism.(9) The respiratory and cardiovascular parameters were stable throughout the procedures.

Following extubation, all patients were cared for in the ICU. Pain relief was provided using the epidural catheter for the first day. Subsequently the patients were comfortable with diclofenac sodium suppositories (100mg) twice a day. The requirement for opioid analgesics was minimal. All patients were mobilized after twenty four hours.

Patients were given oral sips forty eight hours after surgery, semisolids on the fifth post-operative day and a normal diet two days later.

One patient developed pneumonia on the seventh post-operative day and succumbed eight days later. Other patients were discharged eight to ten days following surgery.

Postoperative complications were minimal in all patients and none had anastomotic leaks or prolonged ileus.

All pathological specimens revealed clear resection margins.

II. DISCUSSION

Laparoscopic pancreaticoduodenectomy poses a steep and challenging learning curve for a surgeon. The usefulness and progression to laparoscopic pancreaticoduodenectomy with necessity for hand assisted or hybrid adaptations was reviewed by Gagner and Palermo in 2009.

Adaptation to a sequential learning curve requiring conversion to open surgery at varying stages of the procedure due to lack of progress or risk of bleeding was practised for the safety of the patient. Prior experience of the open technique is a necessity.

Following a laparoscopic dissection to any stage of the resection, the subsequent laparotomy for progression required a midline incision less than 10cm in length. Our intent is to complete the hepatico jejunostomy laparoscopically in the future that would facilitate the pancreatic gastrostomy and gastro-jejunosotomy using a smaller incision.

All the patients were stable intra and post operatively enabling extubation at the end of procedure. Analgesic requirements, period of ICU and hospital stay, were much less than following open surgery. Oral intake was earlier than with the open procedure and the patients were considerably more comfortable.

III. CONCLUSIONS

Sequential surgical progression towards laparoscopic pancreaticoduodenectomy by us is described with the intent of encouraging a technique primarily to minimize patient discomfort, blood loss and enable early feeding, mobilization and discharge; thus reducing institutional costs.. Our experience reveals that this technique is achievable and outcomes are more favourable to patients compared to open pancreaticoduodenectomy.

REFERENCES

- [1] Gagner M, Palermo M. Laparoscopic Whipple procedure: review of the literature. *J HepatobiliaryPancreat Surg.* 2009;16(6):726-30. doi: 10.1007/s00534-009-0142-2. Epub 2009 Jul 28.
- [2] Dulucq JL, Wintringer P, Stabilini C, Feryn T, Perissat J, Mahajna A. Are major laparoscopic pancreatic resections worthwhile? A prospective study of 32 patients in a single institution. *SurgEndosc.* 2005 Aug;19(8):1028-34. Epub 2005 May 26
- [3] Lee JS, Han JH, Na GH, Choi HJ, Hong TH, You YK, Kim DG. Laparoscopic pancreaticoduodenectomy assisted by mini-laparotomy. *JSLs.* 2013 Jan-Mar;17(1):68-73.
- [4] Lei P, Wei B, Guo W, Wei H. Minimally Invasive Surgical Approach Compared With Open Pancreaticoduodenectomy: A Systematic Review and Meta-analysis on the Feasibility and Safety. *Surg Laparosc Endosc Percutan Tech.* 2014 Apr 16. [Epub ahead of print]
- [5] Tan-Tam C, Chung SW. Minireview on laparoscopic hepatobiliary and pancreatic surgery. *World J Gastrointest Endosc.* 2014 Mar 16;6(3):60-67.
- [6] Nigri G1, Petrucciani N2, La Torre M2, Magistri P2, Valabrega S2, Aurello P2, Ramacciato G2. Duodenopancreatectomy: Open or minimally invasive approach? *Surgeon.* 2014 Feb 10. pii: S1479-666X(14)00012-2. doi: 10.1016/j.surge.2014.01.006. [Epub ahead of print]
- [7] Bao PQ1, Mazirka PO, Watkins KT. Retrospective Comparison of Robot-Assisted Minimally Invasive Versus Open Pancreaticoduodenectomy for Periapillary Neoplasms. *J Gastrointest Surg.* 2013 Nov 15. [Epub ahead of print]
- [8] Zenoni SA1, Arnoletti JP2, de la Fuente SG2. Recent developments in surgery: minimally invasive approaches for patients requiring pancreaticoduodenectomy. *JAMA Surg.* 2013 Dec;148(12):1154-7. doi: 10.1001/jamasurg.2013.366.
- [9] Gerges FJ, Kanazi G, Jabbour-khoury S. Anesthesia for laparoscopy: a review. *J Clin Anesth.* 2006;18:67-78.

AUTHORS

First Author – Galketiya KB, MBBS, MS, FRCS(Edin), Consultant Surgeon, Teaching Hospital, Peradeniya, Sri Lanka
Second Author – Pinto V, MBBS MD FRCA, FRCRCSI, Consultant Anaesthetist Teaching Hospital, Peradeniya, Sri Lanka

Correspondence Author – Dr. K. B. Galketiya, Senior Lecturer, Department of Surgery, Faculty of Medicine, Peradeniya, Sri Lanka, Fax no; 0094812388371, Telephone: +94 777 884008, Email: kbgalketiya@yahoo.com