

# Laparoscopic Pancreaticoduodenectomy (LPD) for Tumor of the Pancreatic Head. 1<sup>st</sup> Case Performed in West Africa

Omar Sow, Mamadou Ndiaye, Souleymane Mangane, Modou Diop Ndiaye, Aboubacar Traoré, Cheikh H. Badji, Mohamed Doukouré, Reymond Saïdy, Madieng Dieng

Department of Surgery, Peace Hospital, University of Assane Seck, Ziguinchor, Senegal  
Email: sowomar506@gmail.com

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## Abstract

The objective was to present a surgical technique for laparoscopic pancreaticoduodenectomy (LPD) for a tumor of the pancreatic head in a resource-limited setting. The case involved a 55-year-old female patient with a localized tumor of the pancreatic head and a negative metastatic workup. Laparoscopic pancreaticoduodenectomy was indicated. En bloc resection with lymphadenectomy was performed, and reconstruction followed the Child technique. The specimen was extracted through a small midline incision, and two drains were placed. The operative time was 630 minutes, with estimated blood loss of 300 cc. Postoperative care included transfer to the intensive care unit with transfusion of two units of A+ blood, fresh frozen plasma, and initiation of parenteral nutrition. A biliary fistula was observed on postoperative day 4. **Conclusion:** The development of laparoscopic pancreatic surgery has been slow due to the anatomical location of the pancreas, the technical difficulty of the procedure, the low number of patients with localized tumors, and a lack of appropriate equipment in our region.

## Keywords

Tumor, Pancreas, Laparoscopic, Ziguinchor

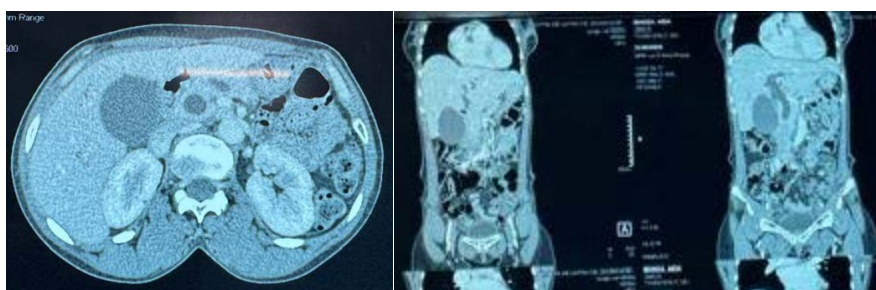
## 1. Introduction

Cephalic duodenopancreatectomy (DPC) is an extensive major procedure, with postoperative mortality rates ranging from 1% to 5% in experienced teams, and morbidity rates of 30% to 40%, half of which are attributable to postoperative pancreatic fistula [1]-[3]. The indications are varied but are predominantly for tumors of the pancreatic head. Laparoscopic cephalic duodenopancreatectomy (LPD), a

relatively recent advancement, remains arguably the most challenging digestive surgery due to the need for extensive vascular dissection and the creation of three digestive anastomoses. Although pancreatic head tumors are still diagnosed at a late stage in our practice, the operation is usually performed using the conventional approach. Here, we report a case of DPCL performed at the Hôpital de la Paix.

## 2. Case Presentation

The patient was a 55-year-old woman with no significant past medical history, admitted for chronic epigastric pain and cutaneous-mucosal jaundice evolving over four weeks. Physical examination revealed a patient in relatively good general condition (WHO performance status: 0), with marked jaundice, dark urine, pale stools without pruritus, and a large, tense, painless, and mobile gallbladder on respiration. Abdominal computed tomography (CT) showed a hypodense mass in the head of the pancreas measuring  $25 \times 22 \times 20$  mm, associated with double duct dilation. Staging workup (thoracoabdominopelvic CT) showed no vascular invasion or distant metastases (**Figure 1**). Biological tests (**Table 1**) were normal.



**Figure 1.** Abdominal CT scan showing a mass in the head of the pancreas with double-duct dilation and distension of the gallbladder.

**Table 1.** Biological parameters.

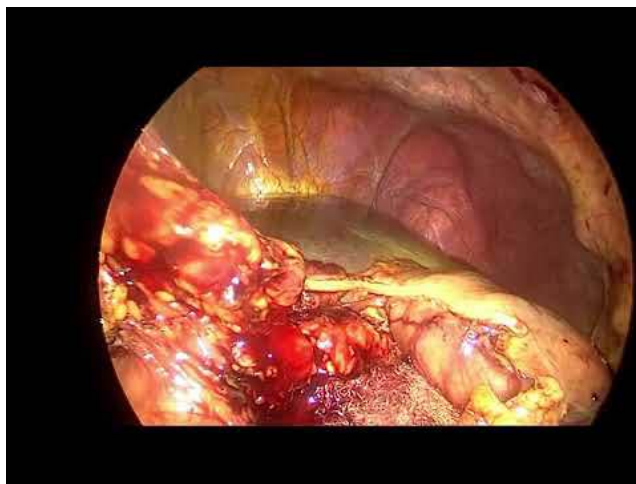
Parameters	Value
Blood glucose	0.76
Creatinin	16
AST	712
ALT	517
Bilirubin total	1.8
Conjugated bilirubin	0.7
Antigen HBs	Negative
ALP	180
Prothrombin time	63%
Platelets	240,000
Hemoglobin	11.6
Albumin	38
Protein total	56
BMI	24

The LPD was planned. This intervention was performed by a senior surgeon with over 10 years of expertise in laparoscopic digestive surgery.

### Operative Technique

The patient is positioned in the dorsal decubitus position with legs apart, and the surgeon stands between the legs. An open coelioscopic approach is performed with placement of a 12 mm optical trocar and insufflation of CO<sub>2</sub> to a pressure of 12 mm Hg. The remaining trocars (3) are inserted in triangulation under direct visual control.

**Surgical procedure (Figure 2):** After exploration of the abdominal cavity, a colo-epiploic detachment was performed using LigaSure, followed by pedicular lymphadenectomy, a Kocher maneuver for duodenopancreatic mobilization, dissection of the superior mesenteric pedicle, vascular control, jejunal division, and then reduction and transection of the gastric antrum using an Endo GIA. We proceeded with division of the common bile duct, gallbladder, and pancreatic head, allowing mobilization of the specimen to the right side, with ligation of duodenopancreatic vessels along the way and dissection of the portal plane to complete the resection. The pancreaticojejunostomy and hepaticojejunostomy were performed manually using 4/0 PDS sutures. The gastrojejunostomy was performed mechanically in an extracorporeal fashion through a 4 cm midline incision, which was also used to extract the specimen. Two drains were left in contact with the anastomoses. The operative time was 630 minutes, and estimated blood loss was 300 cc.



**Figure 2.** LPD vidéo: <https://youtu.be/SihmBCX-3Ew>.

**Postoperative follow-up:** the patient was transferred to the intensive care unit and received a transfusion of 2 units of A+ blood, fresh frozen plasma, and parenteral nutrition. A biliary fistula grade B for ISGPS criteria was observed on day 4. Antibiotic and drain was perform. Oral feeding was permitted on day 8, and the patient was discharged from intensive care on day 10. Histopathological analysis

of the surgical specimen revealed an adenocarcinoma. Twelve lymph nodes were sampled, two of which were invaded. The resection margins were clear.

### 3. Discussion

Surgery remains the only potentially curative treatment for malignant pancreatic tumors, with multiple options available [1]. Laparoscopic pancreaticoduodenectomy is a complex surgery due to the retroperitoneal location of the duodeno-pancreatic block, which is adjacent to major vessels; despite the lack of standardization, it is commonly performed in developed countries, with technological advances in minimally invasive surgery in recent years [2]-[4]. The procedure requires a long learning curve. In a comparative experience, the technical learning plateau was reached between 25 and 41 cases for surgeon A (57 prior pancreaticoduodenectomies) and between 35 and 51 cases for surgeon B (no prior experience) [5].

Numerous studies in the literature describe patient positioning as presented in our description, with a clear variation in the number of trocars used and the pneumoperitoneum achieved via the open Hasson technique [3] [6] [7]. In a systematic review, the optical port was placed at the umbilicus in 41.7% of cases [8]. This arrangement provides good ergonomics for the surgical team.

We adopted the same technical preference as Mimmo A *et al.*, in their study, which they referred to as the hybrid laparoscopic DPC technique [4]. However, in the reconstruction procedure described by Li YL *et al.*, the assembly was identical to what we described, except that it was performed exclusively laparoscopically [3]. The associated mini-laparotomy, on one hand, allows completion of operative procedures (anastomoses) in our resource-limited context and, on the other hand, facilitates specimen extraction.

In some centers, operative time progressively decreased from 500 minutes initially to 300 minutes after several procedures [7] [9]-[11]. In a systematic review, the average operative duration of laparoscopic PD was 7 to 8 hours [8]. This variability in operative time correlates with the surgeons' experience, while emphasizing that laparoscopic approaches are rare in our practice. This minimally invasive procedure requires meticulous dissection to avoid significant bleeding, which can be difficult to control.

The literature consistently reports lower blood loss with laparoscopic DPC [3] [11] [12]. Staudacher *et al.* reported blood loss between 300 and 400 ml, which aligns with our findings [7]. Intraoperative blood loss is often estimated, and minor differences observed have limited clinical impact. However, previous studies have indicated that the extent of blood loss and the need for transfusions constitute risk factors for postoperative complications, cancer recurrence, and reduced survival [12]. In one study, the nasogastric tube was removed on postoperative day 6<sup>th</sup>, and oral feeding was resumed the following day [7]. In a comparative study of laparoscopic DPC and open surgery, enteral nutrition via jejunostomy tube was started between the third and fourth postoperative days [3]. Enteral feeding should be prioritized, as it allows for rapid patient recovery and may reduce

certain complication risks.

The duration of abdominal drain placement was shorter in the laparoscopic PD group than in the open surgery group ( $P < 0.05$ ) [3].

Laparoscopy is associated with reduced rates of major postoperative complications and shorter hospital stays and/or intensive care unit stays, with statistically significant differences widely discussed in the literature [5] [9] [12] [13]. However, some studies on laparoscopic PD report an average hospital stay of two weeks [7] [10] [11]. This may contribute to a reduction in both the cost of care and the length of convalescence.

The overall rate of postoperative complications was 36% in a comparative analysis [3]. Some authors with large cohorts reported a case of bile leak, which was managed medically [3] [10]. Furthermore, the rate of biliary fistula reached 9.5% in one study, which stated that the laparoscopic approach improves exposure and dissection but increases postoperative anastomotic complications [4]. In addition, the minimally invasive approach potentially offers the advantage of reducing operative trauma and blood loss, thereby preserving immune function and decreasing the risk of tumor progression [12]. Another study reported that, in an expert center, laparoscopic PD ensures oncological outcomes, with lower long-term morbidity and mortality in patients with resectable tumors compared to open surgery [14].

Several studies have reported zero perioperative mortality [7] [10]. In other studies, however, postoperative mortality ranged from 0 to 7.1%. While the possibility that some deaths were not reported cannot be excluded, these figures indicate that laparoscopy is a potentially safe procedure when performed in a specialized center [4] [8] [11]. Recently, the LEOPARD-2 trial, which reported a high mortality rate, tempered the initial enthusiasm for laparoscopic pancreaticoduodenectomy [15].

#### 4. Conclusion

This technique must be tailored according to the size of the tumor, the risk of biliopancreatic fistula, and the level of expertise of the surgical team. Its adoption has been slow due to the technical complexity of the procedure, the low number of patients presenting with localized tumors, and a lack of appropriate equipment in our region.

#### Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

#### References

- [1] Whipple, A.O., Parsons, W.B. and Mullins, C.R. (1935) Treatment of Carcinoma of the Ampulla of Vater. *Annals of Surgery*, **102**, 763-779.  
<https://doi.org/10.1097/00000658-193510000-00023>
- [2] Nigri, G., Petrucciani, N., La Torre, M., Magistri, P., Valabrega, S., Aurello, P., et al (2014) Duodenopancreatectomy: Open or Minimally Invasive Approach? *The Sur-*

- geon*, **12**, 227-234. <https://doi.org/10.1016/j.surge.2014.01.006>
- [3] Li, L., Bo, Z., Liu, Q., Wang, G., Zhang, W. and Liang, Q. (2023) Comparative Analysis of Clinical Efficacy between Laparoscopic and Open Pancreaticoduodenectomy. *Medicine*, **102**, e33588. <https://doi.org/10.1097/md.00000000000033588>
- [4] Mimmo, A., Al-Sadairi, A.R., Rhaïem, R., Rached, L.J., Tashkandi, A., Zimmermann, P., et al. (2020) Laparoscopic Pancreatoduodenectomy Using the “Hybrid” Technique: An Improvement over the Traditional Dissection Technique. *Journal de Chirurgie Viscérale*, **157**, S162. <https://doi.org/10.1016/j.jchirv.2020.07.063>
- [5] Li, D., Du, C., Wang, W., Zhang, J. and Liu, J. (2023) First Assistant Experience in Total Laparoscopic Pancreaticoduodenectomy: Accelerating the Learning Curve for an Operator. *BMC Surgery*, **23**, Article No. 92. <https://doi.org/10.1186/s12893-023-01987-8>
- [6] Silviu-Tiberiu, M., Vito, D.B., Alexandru, M.M., Luca, A., Martine, G. and Santiago, A.J. (2025) Laparoscopic Pancreaticoduodenectomy after Roux-en-Y Gastric Bypass: Case Report and Literature Review. *Case Reports in Surgery*, **2025**, Article ID: 9982214. <https://doi.org/10.1155/cris/9982214>
- [7] Staudacher, C., Orsenigo, E., Baccari, P., Palo, S.D. and Crippa, S. (2005) Laparoscopic Assisted Duodenopancreatectomy. *Surgical Endoscopy*, **19**, 352-356. <https://doi.org/10.1007/s00464-004-9055-y>
- [8] Boggi, U., Amorese, G., Vistoli, F., Caniglia, F., De Lio, N., Perrone, V., et al. (2015) Laparoscopic Pancreaticoduodenectomy: A Systematic Literature Review. *Surgical Endoscopy*, **29**, 9-23. <https://doi.org/10.1007/s00464-014-3670-z>
- [9] Zimmerman, A.M., Roye, D.G. and Charpentier, K.P. (2018) A Comparison of Outcomes between Open, Laparoscopic and Robotic Pancreaticoduodenectomy. *HPB*, **20**, 364-369. <https://doi.org/10.1016/j.hpb.2017.10.008>
- [10] Zhou, H., Yu, S., Wu, X. and Li, X. (2022) Application of Purse String Suture Pancreaticojejunostomy for Undilated Pancreatic Duct in Total Laparoscopic Pancreaticoduodenectomy. *BMC Surgery*, **22**, Article No. 195. <https://doi.org/10.1186/s12893-022-01640-w>
- [11] Wang, M., Pan, S., Qin, T., Xu, X., Huang, X., Liu, J., et al. (2023) Short-Term Outcomes Following Laparoscopic vs Open Pancreaticoduodenectomy in Patients with Pancreatic Ductal Adenocarcinoma. *JAMA Surgery*, **158**, 1245-1253. <https://doi.org/10.1001/jamasurg.2023.5210>
- [12] Kamarajah, S.K., Bundred, J.R., Marc, O.S., Jiao, L.R., Hilal, M.A., Manas, D.M., et al. (2020) A Systematic Review and Network Meta-Analysis of Different Surgical Approaches for Pancreaticoduodenectomy. *HPB*, **22**, 329-339. <https://doi.org/10.1016/j.hpb.2019.09.016>
- [13] Kabir, T., Tan, H.L., Syn, N.L., Wu, E.J., Kam, J.H. and Goh, B.K.P. (2022) Outcomes of Laparoscopic, Robotic, and Open Pancreatoduodenectomy: A Network Meta-Analysis of Randomized Controlled Trials and Propensity-Score Matched Studies. *Surgery*, **171**, 476-489. <https://doi.org/10.1016/j.surg.2021.07.020>
- [14] Zhang, Z., Yin, T., Qin, T., Pan, S., Wang, M., Zhang, H., et al. (2022) Comparison of Laparoscopic versus Open Pancreaticoduodenectomy in Patients with Resectable Pancreatic Ductal Adenocarcinoma: A Propensity Score-Matching Analysis of Long-Term Survival. *Pancreatology*, **22**, 317-324. <https://doi.org/10.1016/j.pan.2021.12.005>
- [15] de Rooij, T., van Hilst, J., Bosscha, K., Dijkgraaf, M.G., Gerhards, M.F., Groot Koerkamp, B., et al. (2018) Minimally Invasive versus Open Pancreatoduodenectomy (LEOPARD-2): Study Protocol for a Randomized Controlled Trial. *Trials*, **19**, Article No. 1. <https://doi.org/10.1186/s13063-017-2423-4>