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Digestive Sleeving of the Pancreatico-Jejunal Anastomosis, Khenchoul's Technique or the Vascularized Digestive Cylinder: A Technical Note

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Abstract | **Review Article**

Be called the Achilles heel of this operation. We describe a technique of sleeving the pancreaticojejunal anastomosis with a digestive cylinder from the first intestinal loop. Its aim is to decrease the importance and the frequency of pancreatic fistulas, thus reducing the morbi-mortality of duodenopancreatectomies.

Keywords: Pancreatic cancer, pancreaticojejunal anastomosis, pancreatic fistula, duodenopancreatectomy.

Introduction and Literature Review

Whipple's pancreaticoduodenectomy (WPD) is a complex and technically demanding operation. In the last two decades, mortality of WPD has improved significantly. Most high-volume centers report mortality of less than 5% [1-8] and many reports have been published with no mortality [9-11]. However Morbidity of this procedure remains high between 30-50% even in high volume centers [4-7, 11, 12]. Most of this morbidity revolves around the pancreaticojejunal anastomosis.

Pancreatic cancer is the fourth leading cause of cancer death in the United States, with more than 40,000 estimated deaths each year and nearly 49,000 new diagnoses. The 5-year overall survival is 7%.1 Surgical treatment is the only potentially curative treatment [13].

The rate of postoperative pancreatic fistula remains approximately 10-20%, even in institutions treating large numbers of cases. The best strategy to restore continuity between the pancreatic residue and the gastrointestinal tract is still debated [14].

The purpose of pancreatic-jejunal anastomosis during resection of the pancreatic head is to ensure the flow of pancreatic secretions into the jejunum by avoiding anastomotic insufficiency. This results in a postoperative pancreatic fistula, i.e. the flow of pancreatic juice into the free abdominal cavity.

The pancreatic fistula is defined by a secretion from the 3rd postoperative day with an amylase level that is 3 times higher than the normal serum value. The digestive sleeve with a vascularized digestive cylinder from the first loop is a technical option that aims to reduce the abundance and therefore the severity of a pancreatico-jejunal fistula and consequently to reduce the morbi-mortality of cephalic duodenopancreatectomy. The principle of this technique is borrowed from the pseudo-continuous colostomy in lower rectal surgery. It should be noted that our digestive cylinder is vascularized, which ensures good viability and maximum functionality.

Morbidity at 90 days was 6.9%. The volume-outcome relationship was 1.9 times higher in the very low-volume centers than in the high-volume centers and 1.5 times higher in the low-volume centers. There was no statistical difference between high and very high volume centers [15].

The different anastomosis techniques all aim to treat the two causes of pancreatic anastomosis insufficiency leakage and local pancreatitis, a compromise must be found, as strategies to avoid pancreatic fistula are sometimes contradictory. The pancreas should be sealed with as many sutures as possible to prevent the expulsion of pancreatic juice from the duct and the resection area. However, a high

number of stitches may increase the likelihood of local pancreatitis as well as the likelihood of shearing forces in the pancreas.

One of the advantages of invaginated pancreatojejunostomy is the complete shunting of the pancreas into the jejunum. Thus the pancreatic juice flows directly into the small intestine. An empirical argument against invagination pancreatojejunostomy is the larger jejunal diameter. In case of insufficient anastomosis there is thus a clearly large outlet for the small intestinal secretions into the abdomen. In case of insufficient anastomosis, the leakage of the small intestine remains small.

The goal of our vascularized digestive sleeve is to decrease the leakage through the pancreaticojejunal anastomosis, this will necessarily decrease the severity and impact of this leakage. The digestive tip will act as a clamp around the pancreaticojejunal anastomosis. Of course this technique is reserved for the terminal hepaticojejunal anastomosis.

Technical Description

The digestive sleeving of the pancreatico-jejunal anastomosis is a technique whose principle is borrowed from the pseudo-continental colostomy; the latter allows to avoid the abdomino-perineal amputation which is a radical gesture, having made a pseudo-sphincter from a colonic cylinder. Our technique reproduces the same principle but our sleeve (two centimeters of the first intestinal loop) is vascularized, which allows an efficiency and a safer and more reliable technique.

Step 1: A piece of about two to three centimeters is prepared with its vascular pedicle from the first intestinal loop (Figure 1, 2).

Step 2: After the pancreatico-jejunal anastomosis has been made, this digestive stump will be opened in the form of a cylinder, then carefully cleaned and its mucous membrane removed in order to avoid secretions from the latter (Figure 3-5).

Step 3: This cylinder will be placed around the anastomosis in contact with the jejuno-pancreas, in the form of a sleeve and it will be fixed by 2 to 3 stitches, 4/0 pds thread on the pancreatic side, and 2 to 3 stitches of the same thread on the jejunal side (Figure 6).

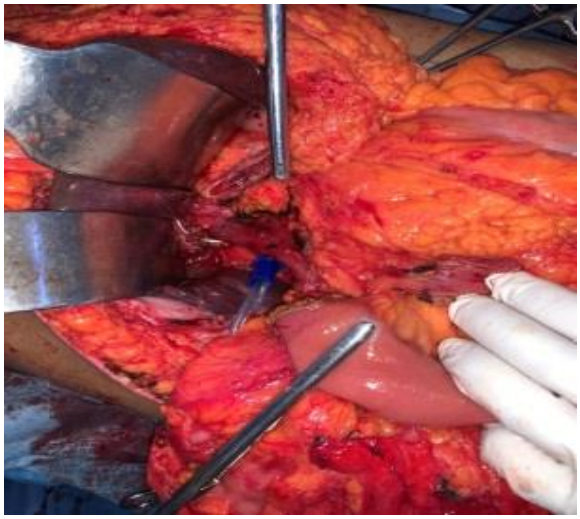

Figure 1: Preparation of the pancreatic stump

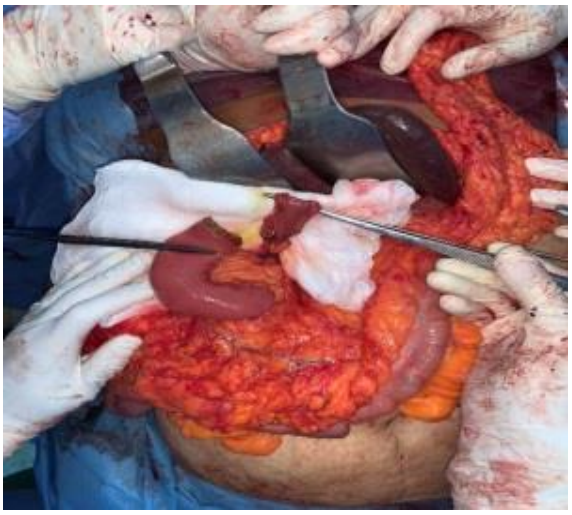

Figure 2: Preparation of the vascularized digestive tract

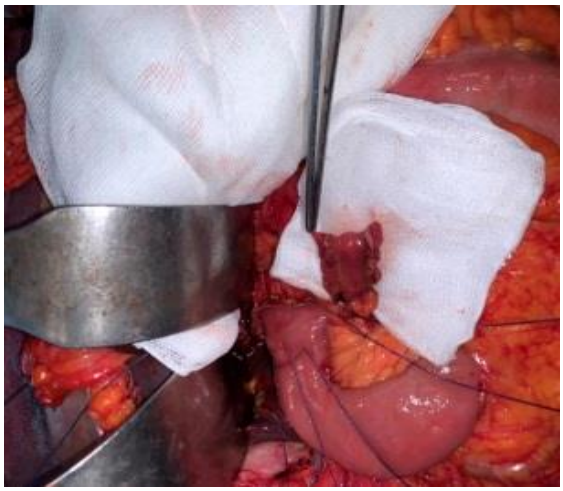

Figure 3: Preparation of the terminal pancreaticojejunal anastomosis

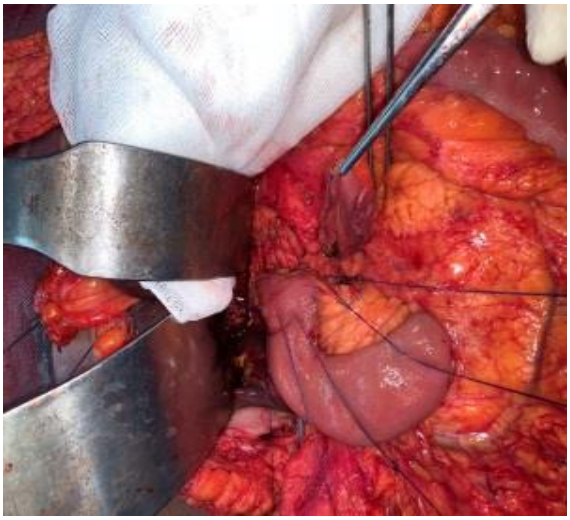

Figure 4: Pancreaticojejunal anastomosis

Figure 5: Opening and preparation of the digestive cylinder

Figure 6: Sleeving of the anastomosis

CONCLUSION

Our center is considered as a reference service with a high operative volume concerning pancreatic surgery, cephalic duodeno-pancreatectomy still remains a heavy intervention with a high morbi-mortality rate. In spite of a small sample of patients, this technique is safe and feasible, it seems promising and can bring solutions to decrease the frequency and the abundance of pancreaticojejunal fistulas and thus decrease the postoperative morbidity and mortality.

REFERENCES

1. Pramod, K. M., Sundeep, S., Saluja, M. G., Rajesh, R., & Premanand, P. (2011). Department of Gastrointestinal Surgery, GB Pant Hospital, New Delhi India, Blumgart's Technique of Pancreaticojejunostomy: An Appraisal. *Dig Surg*, 28, 281–287, Received: March 5, 2011 Accepted after revision: May 23, 2011Published online: July 29, 2011
2. Cameron, J. L., Riall, T. S., Coleman, J., & Belcher, K. A. (2006). One thousand consecutive pancreaticoduodenectomies. *Ann Surg*, 244, 10–15.
3. McPhee, J. T., Hill, J. S., Whalen, G. F., Zayaruzny, M., Litwin, D. E., Sullivan, M. E., ... & Tseng, J. F. (2007). Perioperative mortality for pancreatectomy: a national perspective. *Annals of surgery*, *246*(2), 246-253.
4. Neoptolemos, J. P., Russell, R. C., Bramhall, S., & Theis, B. (1997). Low mortality following resectionfor pancreatic and periampullary tumours in 1026 patients: UK survey of specialist pancreaticunits. UK Pancreatic Cancer Group. *Br J Surg*, 84, 1370–1376.
5. Yeo, C. J., Cameron, J. L., Sohn, T. A., Lillemoe, K. D., Pitt, H. A., Talamini, M. A., ... & Abrams, R. A. (1997). Six hundred fifty consecutive pancreaticoduodenectomies in the 1990s: pathology, complications, and outcomes. *Annals of surgery*, *226*(3), 248-260.
6. Ho, V., & Heslin, M. J. (2003). Effect of hospital volume and experience on in-hospital mortality for pancreaticoduodenectomy. *Ann Surg*, 237, 509–514.
7. Büchler, M. W., Friess, H., Wagner, M., Kulli, C., Wagener, V., & Z'Graggen, K. (2000). Pancreatic fistula after pancreatic head resection. *Br J Surg*, 87, 883–889.
8. Beger, H. G., Gansauge, F., Schwarz, M., & Poch, B. (2007). Pancreatic head resection: the risk for local and systemic complications in 1315 patients—a monoinstitutional experience. *The American journal of surgery*, *194*(4), S16-S19.
9. Trede, M. I. C. H. A. E. L., Schwall, G., & Saeger, H. D. (1990). Survival after pancreatoduodenectomy. 118 consecutive resections without an operative mortality. *Annals of surgery*, *211*(4), 447-458.

10. Cameron, J. L., Pitt, H. A., Yeo, C. J., Lillemoe, K. D., Kaufman, H. S., & Coleman, J. (1993). One hundred and forty-five consecutive pancreaticoduodenectomies without mortality. *Ann Surg*, 217, 430–438.
11. Aranha, G. V., Hodul, P. J., Creech, S., & Jacobs, W. (2003). Zero mortality after 152 consecutive pancreaticoduodenectomies with pancreaticogastrostomy. *J Am Coll Surg*, 197, 223–232.
12. Grobmyer, S. R., Pieracci, F. M., Allen, P. J., Brennan, M. F., & Jaques, D. P. (2007). Defining morbidity after pancreaticoduodenectomy: use of a prospective complication grading system. *J Am Coll Surg*, 204, 356–364
13. Ammori, J. B., Choong, K., & Hardacre, J. M. (2016). Surgical therapy for pancreatic and periampullary cancer. *Surgical Clinics*, *96*(6), 1271-1286.
14. Xu, J., Ji, S. R., Zhang, B., Ni, Q. X., & Yu, X. J. (2018). Strategies for pancreatic anastomosis after pancreaticoduodenectomy: what really matters?. *Hepatobiliary & Pancreatic Diseases International*, *17*(1), 22-26. homepage: www.elsevier.com/locate/hbpd
15. Mehdi El, A., Guillaume, C., Xavier, L., Claire, L., Anthony, T., Didier, T., François-René, P., & Stéphanie, T. Department of Digestive Surgery and Transplantation, Medical Information Department, Department of Medical Oncology, Lille University Hospital, University of Lille, and 5EA2694 - Evaluation des Technologies de Santé et des Pratiques Médicales, Lille, France, Should all pancreatic surgery be centralized regardless of patients' comorbidity?