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Case Report

Duodenum-Pancreatectomy with Pancreatic Abandonment, Report of the First Case of This Technique in Ecuador

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ABSTRACT

The incidence of malignant tumors of the pancreas has increased in countries of the Asian continent and in Western nations, the mortality of radical respective surgery of the pancreas is less than 3%, the postoperative pancreatic fistula is present in 10%, the associated mortality the development of a post-surgical pancreatic fistula can reach up to 40% 4-5-6-7. We present a clinical case of a patient with adenocarcinoma of the head of the pancreas in which a variant of the classic technique was applied, "leaving" the distal pancreas. A 70-year-old male patient, diabetic and hypertensive, who presents with abdominal pain and jaundice, a laboratory confirms an obstructive cholestasis pattern, a tomography shows adenocarcinoma of the head of the pancreas, a Whipple procedure was performed and it was decided not to perform a jejunal pancreatic anastomosis by placing a surgical sealant patch. In pancreatic remnant, the patient develops a fistula at 7 days of low output that responds to clinical management and closure of the same at 40 days. Pancreatic fistula in pancreatic duodenectomy is associated with high morbidity and mortality, several techniques have been described to avoid its appearance with variable results and clinical management through the use of somatostatin analogues does not show a protective effect. The use of fibrin sealants as glue or as a patch was described has been described by several authors, where the incidence of fistula did not decrease, many of these series report the use of glue as an adjuvant to the anastomosis, in our case we opted for Dispense with the anastomosis and seal the pancreatic remnant with a fibrin patch, taking as reference the work presented by Marczell in 1992, performing a risk-benefit analysis between a pancreatic leak with or without anastomosis, we can tip the balance and generate the hypothesis that a patient who develops a postoperative fistula without pancreatic anastomosis will have a better outcome. The use of hemostatic sealants shows certain benefits in hepatobiliary and pancreatic surgery, in our case they did not prevent the development of a fistula, but by "leaving" the pancreas, the evolution and control of the fistula did not cause major complications, which are very common when it appears. With the classical technique.

Keywords: Whipple surgery; Fibrin sealants; Hemostatic patch; pancreatic anastomosis**.**

INTRODUCTION

The incidence of malignant tumors of the pancreas has increased in countries of the Asian continent and in Western nations; surgical resection continues to be the cornerstone in the management of this pathology [1]. At present, the mortality of radical resective surgery of the pancreas is less than 3% in centers with experience and with high volume [2,3]. Post-operative pancreatic fistula is present in 10% of procedures; it is the main cause of complications and deaths in these patients [4,5]. The risk factors described for the development of a pancreatic fistula are the male sex, a BMI over 25, the pancreatic-intestinal anastomosis technique, determination of capillary glucose below 108 mg / dl, among others [6-9]. Mortality associated with the development of a post-surgical pancreatic fistula can reach up to 40% [4,5-10,11]. Multiple studies have been carried out on the prevention strategies for this complication and even on variants in the classical technique1. In this work we present a clinical case of a patient with adenocarcinoma of the head of the pancreas in whom a variant of the classic technique was applied that consisted of not performing the pancreatojejunal anastomosis and a hemostatic patch sealant was placed in the pancreatic remnant, " leaving "the distal pancreas.

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CLINICAL CASE

This is a 70-year-old male patient with a history of type II diabetes mellitus under treatment with insulin, hypertension under treatment with losartan 100mg per day, who went to the emergency service due to intermittent abdominal pain of 3 days of evolution in upper hemi abdomen, with radiation to lumbar region, nausea without vomiting; on physical examination a heart rate of 82 bpm, respiratory rate of 20rpm, temperature 36.3 ° C, 91% saturation in ambient air, jaundice in scleras, skin and mucosa, tender abdomen on deep palpation in the epigastrium and right upper quadrant. Hemogram shows leukocytes of 14,000 with a left shift, normal hemoglobin and hematocrit, normal platelets, total bilirubin of 12 with a predominance of the direct fraction of 11, TGP of 76, TGP of 56, alkaline phosphatase of 670, Glucose of 145 , Creatinine 0.7, CRP 120. Ultrasound: cholelithiasis, common bile duct: 17 mm increased diameter. Abdominal tomography: large-caliber common bile duct with a space-occupying lesion in its distal portion, located in projection of the uncinate process of the pancreas with defined contours, heterogeneous lobulated borders with signs of tumor necrosis of 65 x 62 x 55 mm and a volume of 113. 67 cc, causing extrinsic compression of the third portion of the duodenum, retroperitoneal pericaval and peri - aortic adenomegalies. Diagnosis: mass in the pancreas with an uncinate process that causes dilation of the common bile duct and extrinsic compression of the ipsilateral duodenum with retroperitoneal lymphadenopathy plus gallstones. A preliminary positive needle biopsy report is obtained for adenocarcinoma of the pancreas. Whipple procedure is planned, finding: Large tumor in the head of the pancreas that extends to the inferior mesenteric vein, common hepatic artery and portal vein, common bile duct 1.5 cm in diameter, and cholelithiasis (Figure 1). A total cholecystectomy plus pancreaticoduodenectomy was performed without preservation of the pylorus plus Roux-en-Y reconstruction with gastro-enteric and choledochojejunal anastomosis, it was decided not to perform a pancreaticjejunal anastomosis and a surgical sealant patch was placed in the pancreatic remnant (Figures 2 and 3) and suction drainage was also placed in said region. From another in the pelvic region towards the rectovesical recess (Figure 4). The patient remains in the intensive care area for 5 days, is supplemented with hyperprotein parenteral nutrition, with a total requirement of 2175 kcal with 1.72 grams of protein, a 70: 1 ratio. In the general surgery service the TPN was progressively withdrawn and enteral nutrition was started successfully, suction drainage in the cul-de-sac removed due to low production on the sixth day, drainage is maintained at the level of the pancreatic remnant, the same that begins pancreatic fluid productions (confirmed by amylase measurement) at 7 days, with debits of 400cc per day. Hospital discharge was decided 9 days after surgery for monitoring and weekly drainage control by outpatient consultation and with somastotatin analogues. Remaining drainage is withdrawn 40 days after discharge from the hospital in an outpatient clinic with zero production thereof, and additional oral supplementation of pancreatic enzymes is instituted three times a day. Patient complies with the established chemotherapy scheme without evidence of tumor recurrence one year after the procedure.

DISCUSSION

Pancreatic fistula in pancreatic duodenectomy is associated with high morbidity [12] and mortality [13] as mentioned at the beginning,

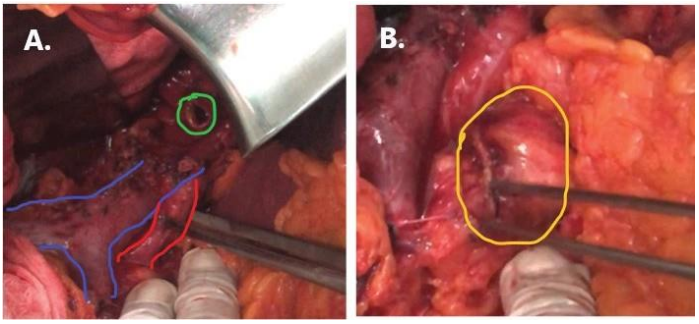

Figure 1. A: Surgical bed after excision of the duodenum and head of the pancreas; A: Formation of the portal vein by the splenic vein and superior mesenteric vein (Blue), common hepatic artery (Red), Sectioned bile duct(green), B: Pancreatic stump (yellow).

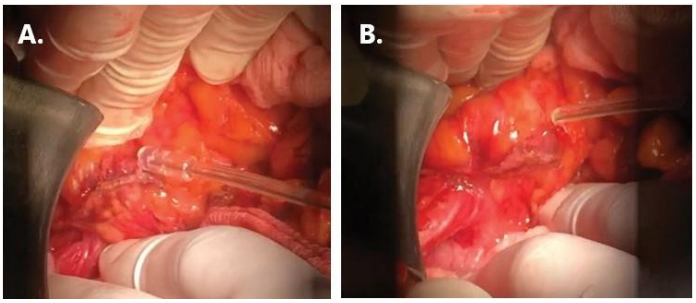

Figure 2: A y B: Pancreatic stump reinforcement with gel hemostatic in two phases.

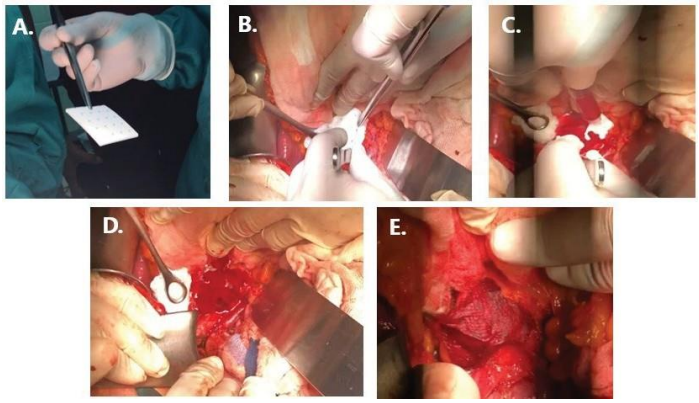

Figure 3: Phases of the hemostatic patch placement on the pancreatic stump; A: Hemostatic patch, B: Pancreatic stump patch placement, CImpregnation of the patch and humidification of the same with blood autologous for patch fixation, D: Patch adhered and moistened with blood on pancreatic stump, E: Patch completely adhered to pancreatic stump, final result.

some studies indicate that pancreatic jejunal anastomosis with mucosal duct technique is the safest [12], however the use of other additional variants have been described with results positive, such is the case of gastropancreatic anastomosis [14], although certain authors do not report differences when comparing both techniques [15,16]. In addition to the aforementioned techniques, we can add certain measures that seek to reduce the development of a pancreatic fistula, such as the use of biological glues, intra-anastomotic stents or coverage with an omental flap [14]. Many authors describe the pancreatic anasotomosis in this surgery as the Achilles heel of the procedure, [17] so the objective is to ensure adequate blood flow and reduce tension at the site of the anastomosis [18,19,20]. In addition to the different surgical techniques, clinical management through the use of somatostatin analogues has been studied

Figure 4: Anatomical specimen, duodenum with tumor mass in the head of the pancreas.

without identifying a true protective or prophylactic effect for the development of a fistula, 12 in our patient it was decided to use it in the postoperative period since The criteria established for the definition of post-operative pancreatic fistula were met [21,22]. According to the international group of pancreatic surgery, there is no standard technique that guarantees the absence or reduction of the risk of the development of a fistula; the experienced surgeon could choose a specific technique according to his experience [23]. The use of fibrin sealants as glue or as a patch was described in a study with 125 patients, where the incidence of fistula did not decrease compared to the control group (26 - 30% respectively), nor was there a decrease in the stay [24], our patient did present a fistula that did not generate complications in general measures, which indicates that the effect to completely avoid the presence of pancreatic leak is minimal, despite the fact that the effectiveness to seal ductal leaks has been evaluated in some animal models [25,26], but with not so positive effects in humans [27] in studies with a good number of patients, despite the optimistic results of other authors [28-31]. However, many of these series report the use of glue as an adjuvant to the anastomosis, in our case it was decided to dispense with the anastomosis and seal the pancreatic remnant with a fibrin patch, taking into account the positive results reported in liver resection surgeries. where a good control of bleeding is obtained and a decrease in the incidence of a bile leak [32,33], however, it should be noted that the results in the use of these patches and sealants do not have solid evidence at the moment, since they differ according to the characteristics of the surgery, type of tissue and technique for its use [34]. In our patient, we extrapolated the reported benefits of the hemostatic collagen patch in liver surgery and applied it to the pancreatic remnant, taking as a reference the work presented by Marczell in 1992, where the result of "abandoning" the pancreas and placing in that pancreas was evaluated. On occasion a fibrin sealant, no deaths were reported but fistula and one patient with pancreatitis, however the endocrine function of the pancreas was not altered [35], a similar result to our patient. The risks of this procedure may arise due to the retention of pancreatic juices after the ligation of the ducts, producing retention pancreatitis and even increasing the risk of developing a fistula [35-37] especially due to the characteristics of certain sealants and their easy degradation in contact with pancreatic enzymes [37]; however, the same author reports the presence of a vital pancreatic parenchyma with good characteristics in tomographic controls 3 years after surgery [35], in addition to performing a benefit-risk analysis between a leak pancreatic with or without anastomosis, we can tip the balance and generate the hypothesis that a patient who develops a postoperative fistula without pancreatic anastomosis will have a better option for its control, a greater probability of spontaneous closure and a lower mortality compared to a fistula with anastomosis, and with preserved endocrine pancreatic function [27-39].

CONCLUSION

The use of hemostatic sealants of natural origin have shown benefits in hepatobiliary and pancreatic surgery with good control of hemostasis and a reduction in the risk of fistulas taking into account that mortality in pancreatic duodenectomy is closely related to leakage in The pancreatic anastomosis, dispensing with it and sealing the pancreatic stump with these sealants can reduce the morbidity and mortality associated with a complicated postoperative fistula of a classic anastomosis, with a low risk of alteration in the pancreatic endocrine function and replacing the exocrine function of the gland with oral substitutes and enzymes; However, more studies are needed to identify possible adverse effects of the technique, such as the true incidence of pancreatitis of the stump due to retention, a complication absent in our patient; In our patient, the use of these sealants did not prevent the formation of the pancreatic fistula, but we maintain the hypothesis that a fistula in a classic anastomosis leads to more severe complications than when the pancreas is "abandoned".

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References

1. Hiromichi K. Surgical techniques and postoperative management to prevent postoperative pancreatic fistula after pancreatic surgery; World J Gastroenterol 2019 July 28; 25(28): 3722-3737.
2. Kimura W, Miyata H, Gotoh M, Hirai I, Kenjo A, Kitagawa Y,et.al. Pancreaticoduodenectomy risk model derived from 8575 cases from a national single-race population (Japanese) using a web-based data entry system: the 30-day and in-hospital mortality rates for pancreaticoduodenectomy. Ann Surg 2014; 259: 773-780.
3. Cameron JL, He J. Two thousand consecutive

pancreaticoduodenectomies. J Am Coll Surg 2015; 220: 530-536.

4. Bassi C, Marchegiani G, Dervenis C, Sarr M, Abu Hilal M, Adham M, et al. International Study Group on Pancreatic Surgery (ISGPS). The 2016 update of the International Study Group (ISGPS) definition and grading of postoperative pancreatic fistula: 11 Years After. *Surgery* 2017; 161: 584-591.
5. Chen BP, Bennett S, Bertens KA, Balaa FK, Martel G. Use and acceptance of the International Study Group for Pancreatic Fistula (ISGPF) definition and criteria in the surgical literature. *HPB (Oxford)* 2018; 20: 69-75.
6. Fernandez-del Castillo C. Pancreatic fistula rates after 462 distal pancreatectomies: staplers do not decrease fistula rates. J Gastrointest Surg 2008; 12: 1691-1697; discussion 1697-8.
7. Seeliger H, Christians S, Angele MK, Kleespies A, Eichhorn ME, Ischenko I, et al. Risk factors for surgical complications in distal pancreatectomy. *Am J Surg* 2010; 200: 311-317.
8. Hu BY, Wan T, Zhang WZ, Dong JH. Risk factors for postoperative pancreatic fistula: Analysis of 539 successive cases of pancreaticoduodenectomy. *World J Gastroenterol* 2016; 22: 7797-7805.
9. Ke Z, Cui J, Hu N, Yang Z, Chen H, Hu J, et al. Risk factors for postoperative pancreatic fistula: Analysis of 170 consecutive cases of pancreaticoduodenectomy based on the updated ISGPS classification and grading system. *Medicine (Baltimore)* 2018; 97: e12151.
10. Fu SJ, Shen SL, Li SQ, Hu WJ, Hua YP, Kuang M, et al. Risk factors and outcomes of postoperative pancreatic fistula after pancreatico-duodenectomy: an audit of 532 consecutive cases. *BMC Surg* 2015; 15: 34.
11. Pedrazzoli S, Liessi G, Pasquali C, Ragazzi R, Berselli M, Sperti C. Postoperative pancreatic fistulas: preventing severe complications and reducing reoperation and mortality rate. *Ann Surg* 2009; 249: 97-104.
12. Ratnayake CB, Wells CI, Kamarajah SK, Loveday B, Sen G, French JJ, et al. Critical appraisal of the techniques of pancreatic anastomosis following pancreaticoduodenectomy: a network meta-analysis, *International Journal of Surgery*.
13. Trede M, Schwall G. The Complications of Pancreatectomy. *Annals of surgery* 1988, Jan; 207(1):39-47.
14. Barreto SG, Shukla PJ. Different types of pancreatico-enteric anastomosis. *Translational gastroenterology and hepatology* 2017;2:89.
15. Crippa S, Cirocchi R, Randolph J. Pancreaticojejunostomy is comparable to pancreaticogastrostomy after pancreaticoduodenectomy: an updated meta-analysis of randomized controlled trials. *Langenbeck's Archives of Surgery* 2016; 401(4):427-437.
16. Yang S, Dou K, Sharma N. The Methods of Reconstruction of Pancreatic Digestive Continuity After Pancreaticoduodenectomy: A Meta-Analysis of Randomized Controlled Trials. *World Journal of Surgery* 2011 Oct; 35(10):2290-2297.
17. Lois A. D, Jasmijn F. S, Marc G. B, Olivier R. B, Inne H. B. R, Hjalmar C.V.S. A web-based overview, systematic review and meta-analysis of pancreatic anastomosis techniques following pancreatoduodenectomy; HPB 2018, 20, 777–785.
18. Shrikhande SV, Barreto G, Shukla PJ. (2008 Jan) Pancreatic fistula after pancreaticoduodenectomy: the impact of a standardized technique of pancreaticojejunostomy. Langenbeck's Arch Surg 393: 87–91.
19. Shrikhande SV, Qureshi SS, Rajneesh N, Shukla PJ. (2005 Dec) Pancreatic anastomoses after pancreaticoduodenectomy: do we need further studies? World J Surg 29:1642–1649.
20. Eric C.H.L, Stephanie H.Y.L, Wan Y. L.Measures to Prevent Pancreatic Fistula After Pancreatoduodenectomy A Comprehensive Review; Arch Surg. 2009; 144(11):1074-1080.
21. Neoptolemos JP, Russell RC, Bramhall S, Theis B; UK Pancreatic Cancer Group. Low mortality following resection for pancreatic and periampullary tumours in 1026 patients: UK survey of specialist pancreatic units. *Br J Surg*. 1997;84 (10):1370-1376.
22. Balzano G, Zerbi A, Capretti G, Rocchetti S, Capitanio V, Di Carlo V. Effect of hospital volume on outcome of pancreaticoduodenectomy in Italy. *Br J Surg*. 2008; 95(3):357-362.
23. Shrikhande SV, Sivasanker M, Vollmer CM, Friess H, Besselink MG, Fingerhut A. International Study Group of Pancreatic Surgery (ISGPS). Pancreatic anastomosis after pancreatoduodenectomy: A position statement by the International Study Group of Pancreatic Surgery (ISGPS). Surgery. 2017 May; 161(5):1221-1234.
24. Lillemoe KD, Cameron JL, Kim MP, Campbell KA, Sauter PK, Coleman JA, et al. Does fibrin glue sealant decrease the rate of pancreatic fistula after pancreaticoduodenectomy? Results of a prospective randomized trial. J Gastrointest Surg. 2004 Nov;8(7):766-72; discussion 772-4.
25. Rosen M, Walsh RM, Goldblum JR. Application of a new collagen-based sealant for the treatment of pancreatic injury. Surg Laparosc Endosc Percutan Tech. 2004 Aug; 14(4):181-5.
26. Balcom JH, Keck T, Warshaw AL, Graeme-Cook F, Fernández-del C. C. Prevention of pancreatic fistula with a new synthetic, absorbable sealant: evaluation in a dog model. J Am Coll Surg. 2002 Oct; 195(4):490-6.
27. Fisher WE, Chai C, Hodges SE, Wu MF, Hilsenbeck SG, Brunicardi FC. Effect of BioGlue on the incidence of pancreatic fistula following pancreas resection. J Gastrointest Surg. 2008 May;12(5):882-90.
28. Ohwada S, Ogawa T, Tanahashi Y. Fibrin glue sandwich prevents pancreatic fistula following distal pancreatectomy. World J Surg 1998; 22(5):494–498.
29. Suzuki Y, Kuroda Y, Morita A. Fibrin glue sealing for the prevention of pancreatic fistulas following distal pancreatectomy. Arch Surg 1995; 130(9):952–955.
30. Tashiro S, Murata E, Hiraoka T, Nakakuma K, Watanabe E, Miyauchi Y. New technique for pancreaticojejunostomy using a biological adhesive. Br J Surg 1987;74(5):392–394.
31. Kram HB, Clark SR, Ocampo HP, Yamaguchi MA, Shoemaker WC. Fibrin glue sealing of pancreatic injuries, resections, and anastomoses. Am J Surg 1991;161(4):479–481. discussion 82
32. Fischer L, Seiler CM, Broelsch CE, Hemptinne B, Klempnauer J, Mischinger HJ, et al. Hemostatic efficacy of TachoSil in liver resection compared with argon beam coagulator treatment: an open, randomized, prospective, multicenter, parallel-group trial. Surgery. 2011 Jan; 149(1):48-55.
33. Moench C, Bechstein WO, Hermanutz V, Hoexter G, Knaebel HP. Comparison of the collagen haemostat Sangustop® versus a carrier-bound fibrin sealant during liver resection; ESSCALIVER-Study. Trials. 2010 Nov 19; 11:109.
34. Sanjay P, Watt DG, Wigmore SJ. Systematic review and meta-analysis

of haemostatic and biliostatic efficacy of fibrin sealants in elective liver surgery. J Gastrointest Surg. 2013 Apr;17(4):829-36.

35. Marczell AP, Stierer M. Partial pancreaticoduodenectomy (Whipple procedure) for pancreatic malignancy: occlusion of a non-anastomosed pancreatic stump with fibrin sealant. HPB Surg. 1992 Jun; 5(4):251-9; discussion 259-60.

36. Marczell, A.P. (1985) Experiences with Fibrin Glue in Pancreas Surgery. Akt. Chir, 2.0, 52.

37. Kühlbrey CM, Kasper S, Chikhladze S, Seifert G, Hopt UT, Fichtner-Feigl S, et al. Bio-absorbable sealants for reinforcing the pancreatic stump after distal pancreatectomy are critical. J Hepatobiliary Pancreat Sci. 2019 Mar; 26(3):96-103.

38. Andersson R. Evidence for improved outcome following use of hemostatic fibrin sealants in HPB surgery? Eur J Trauma Emerg Surg. 2012 Feb;38(1):33-6.

39. Klein F, Sauer IM, Pratschke J, Bahra M. Bovine Serum Albumin-Glutaraldehyde Sealed Fish-Mouth Closure of the Pancreatic Remnant during Distal Pancreatectomy. HPB Surg. 2017; 2017:9747421.