Late Cholangitis After Pancreatoduodenectomy due to Ischemic Stricture of the Jejunal Loop: A Long-Term Complication due to the Terminal Vascularization of the Jejunal Loop

Marcel Autran Machado, MD, and Marcel C. Machado, MD

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Pancreatoduodenectomy is a complex surgical procedure with a high morbidity rate. The most common complications are postoperative pancreatic fistula, bile leakage, and delayed gastric emptying. Postoperative cholangitis is a serious long-term complication that is less studied but can have severe clinical impact. The previously reported incidence is ~10%.[1–3] Postoperative cholangitis may not only occur in combination with an anastomotic or intrahepatic biliary stricture but can also occur without obstruction. Recurrent nonobstructive cholangitis occurs in about 8.4% of patients.[4] Although obstructive cholangitis is best treated by biliary tract intervention, nonobstructive cases are difficult to manage, especially those with multiple episodes of cholangitis and those that do not respond to medical treatment.[4]

In this research letter, we present an interesting and unique case of late cholangitis that occurred in one of our patients 24 years after pancreatoduodenectomy due to ischemic stricture of the jejunal loop without anastomotic stricture.

A 53-year-old male patient underwent pancreatoduodenectomy for distal cholangiocarcinoma with a double jejunal loop for digestive tract reconstruction.[5] The patient had several episodes of acute cholangitis. In the meantime, the patient had ureteral obstruction with chronic renal failure and sepsis with severe episodes of hypotension. 24 years after the first intervention (77-y-old), cholangitis was again observed. An MRI scan revealed obstructive cholangitis with possible stenosis of the jejunal loop and lithiasis of the common bile duct (Fig. 1). Surgical intervention was performed, which revealed a nonobstructive biliary anastomosis but complete obstruction of the jejunal lumen and secondary lithiasis in the jejunal loop. The biliary anastomosis was reconstructed with the same jejunal loop after resection of the damaged segment. Histopathologic examination revealed segmental thinning of the intestinal loop with complete obstruction of the intestinal lumen. Histological examination revealed segment of the small intestine with areas of stenosis and transmural fibrous thickening, fibrinous serositis, and fibrosing serositis with signs of adhesions. Presence of segmental enteritis with ischemic changes and foci of ulceration, focal exudative/suppurative inflammation, and lymphoplasmacytic infiltrate with lymphoid aggregates in the mucosa and submucosa. No granulomas, parasites, or evidence of viral infection detected (Fig. 1). The patient recovered well and was discharged on the 16th postoperative day. Eighteen months after the last operation, the patient is well and has no further episodes of cholangitis. We have not found a similar case in the literature. However, we have seen several cases of ischemia and necrosis of the right colon and cecum in patients with chronic renal failure. In terms of blood supply, the right colon and cecum are terminally vascularized and therefore more prone to ischemia as there is no vascular arcade between the ileal and colic arteries.[6] Ischemia may occur in a subset of patients with hypotension, chronic renal failure, or chronic heart disease.[6,7] Our patient suffered from chronic renal insufficiency and the jejunal loop also shows terminal vascularization similar to the right colon as the arcade was divided during the construction of the loop.

Postoperative cholangitis is a complication of biliary reconstruction after pancreatoduodenectomy. In a recent retrospective cohort study of 900 consecutive patients who underwent pancreatoduodenectomy, late postoperative cholangitis occurred in 10.3%.[4] Among these patients, obstructive cholangitis was observed in 39.8% and nonobstructive cholangitis in 60.2%. Patients without biliary obstruction are difficult to treat. Antibiotics are usually effective but do not prevent recurrence. Periodic courses of antibiotics may reduce but not eliminate the risk of recurrence. In some cases, revision surgery to lengthen the jejunal loop anastomosed to the common bile duct can be performed, but this is usually not effective unless reflux into the biliary system is confirmed by imaging studies.[4]

The main hypothesis for cholangitis without stricture is colonization of bacteria from the intestines ascending the biliary tree.[2] This colonization, resulting in ascending cholangitis, is possible due to the absence of the sphincter of Oddi after pancreatoduodenectomy, which normally serves as a barrier.[2,3]

Another explanation for nonobstructive cholangitis could be abnormal peristalsis of the jejunal loop.[1–4] The cause of this abnormal peristalsis is unknown. The present case suggests that chronic ischemia of the jejunal loop may

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From the Sirio Libanes Hospital, São Paulo, Brazil.
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Address correspondence to: Marcel Autran C. Machado, MD, Department of Surgery, Rua Dona Adma Jafet 74 cj 102, 01308-050, São Paulo, Brazil (e-mail: dr@drmarcel.com.br).

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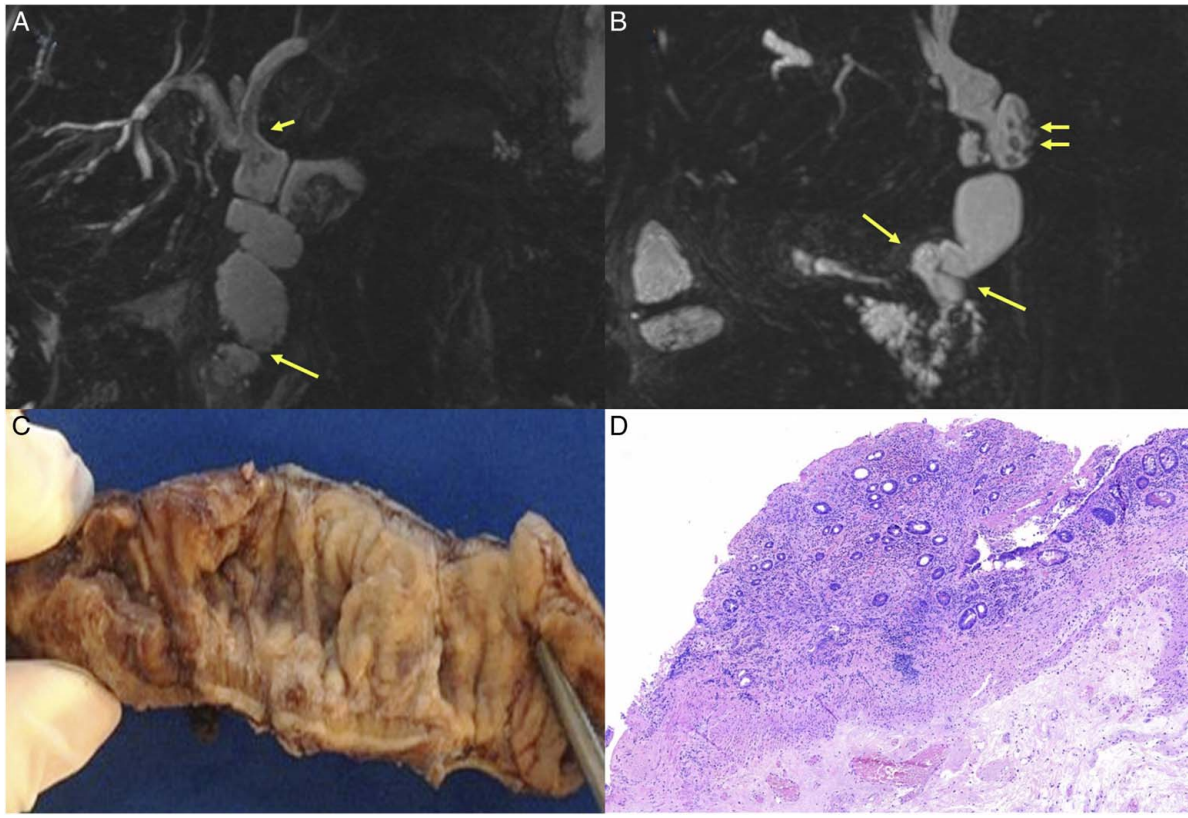

FIGURE 1. Ischemic stricture of the jejunal loop. A, MRI shows moderate dilation of the bile ducts up to the biliodigestive plane, patent (small arrow). Ectasia of the diversion loop, with signs of obstruction (large arrow). B, MRI shows obstruction of the diversion loop (large arrows). Thick content/stones in the bile ducts (small arrows). C, Gross specimen shows segmental thinning and fibrosis. D, Histologic examination revealed presence of segmental enteritis with ischemic changes and foci of ulceration, focal exudative/suppurative inflammation, and lymphoplasmacytic infiltrate with lymphoid aggregates in the mucosa and submucosa.

be the root cause of this abnormal peristalsis. So far, there is no effective way to study and diagnose chronic ischemia of the jejunal loop and the resulting abnormal peristalsis.

In summary, all patients with any type of jejunal loop are at risk of ischemia and/or stricture, especially long-term survivors and patients with chronic renal or cardiac disease.

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