respiratory failure and a grave prognosis.[2,3] None of the patients presented systemic amyloidosis, and, due to their intraparenchymal location, they would be defined as localized pulmonary amyloidosis of the nodular type.

The results reported regarding presentation are contradictory, as some studies observed that the majority of patients presented this disease as a single nodule,[4] while others described multiple lesions.[3]

The diagnosis of pulmonary amyloidoma is very frequently an incidental radiological finding, as in the cases described.[4,5] On CT, there may be a non-pathognomonic but frequent sign, since deposits of amyloid material are associated with calcification,[4] as was observed in the patient with the solitary lesion.

Regarding PET, not many cases have been published, but the existence of false positives has been demonstrated, as it is possible to find an abnormally high SUVmax in pulmonary amyloidoma,[4,5] as in one of our cases. Even so, the usefulness of this test is not ruled out for 2 reasons: the rarity of the disease and the high cost-effectiveness of a non-invasive test for the diagnosis of pulmonary lesions of unknown etiology.[5]

Radiology-guided fine-needle aspiration biopsy of a peripheral pulmonary nodule has a high diagnostic capacity and lower risk of adverse effects than transbronchial needle aspiration.[2] Provided that a lung nodule cannot be identified by the aforementioned methods, surgical biopsy is justified, as a pathology study is required[2,3] as in the cases presented.

In summary, localized nodular pulmonary amyloidosis is a rare disease. However, when presented as incidental lung lesions, it is necessary to rule out a malignant etiology. Surgical biopsy is justified when a definitive diagnosis with less invasive methods is not possible.

REFERENCES

1. Nin CS, de Souza VV, do Amaral RH, Schuhmacher Neto R, Alves GR, Marchiori E, et al. Thoracic lymphadenopathy in benign diseases: a state of the art review. Respir Med. 2016;112:10–7.
2. Natsume S, Nakahara Y, Okamura T, Hishima T. Pulmonary amyloidosis mimicking prostate cancer metastasis. Clin Case Rep. 2015;3:626–8.
3. Xu L, Frazier A, Burke A. Isolated pulmonary amyloidomas: report of 3 cases with histologic and imaging findings. Pathol Res Pract. 2013;209:62–6.
4. Seo JH. Pulmonary amiloidosis mimicking multiple metastatic lesions on F-18 FDG PET/CT. Lung Cancer. 2010;67:376–9.
5. Xu KF, Feng R, Cui H, Tian X, Wang H, Zhao J, et al. Diffuse cystic lung diseases: diagnostic considerations. Semin Respir Crit Care Med. 2016;37:457–67.

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Splenomesenteric Portal Venous Confluence Reconstruction Using Posterior Rectus Abdominis Muscle Sheath as Autologous Graft in Pancreatic Surgery☆

Injerto autólogo de vaina posterior de músculo recto del abdomen para la reconstrucción vascular del confluente espleno-mesentérico-portal en cirugía pancreática

Surgery is the only potentially curative treatment for pancreatic adenocarcinoma. However, only 15%–20% of patients are apt for surgical treatment at the time of diagnosis. The results depend on several factors, including tumor size, lymphatic and/or vascular involvement, extrapancreatic disease and involvement of resection margins.

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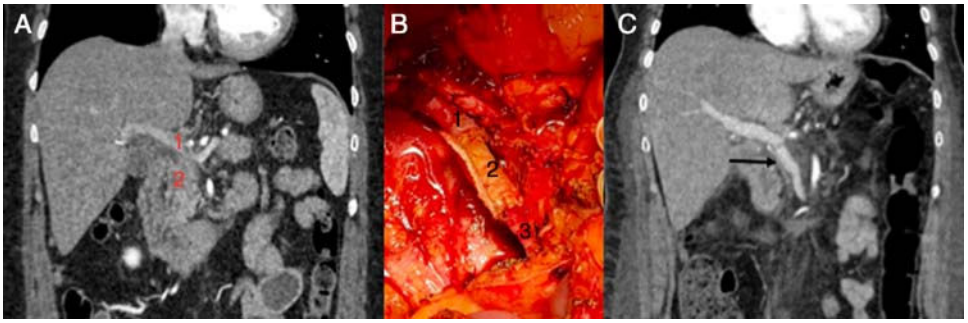

Fig. 1 – Images of Case 1: A) Abdominal CT before surgery; mesenteric-portal confluence (1) and pancreatic tumor (2); B) portal vein (1), tubular graft of rectus abdominis (2), superior mesenteric vein (3); C) abdominal CT after surgery showing correct operation of the graft.

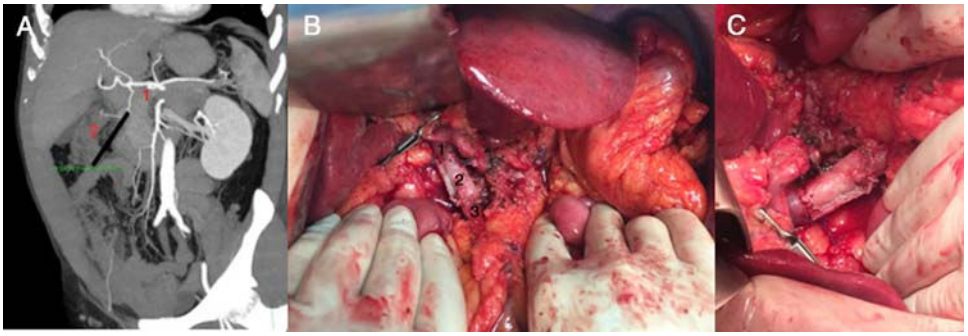

Fig. 2 – Images of Case 2: A) abdominal CT angiography prior to surgery; coronal view in which the pancreatic lesion is observed: mesenteric-portal confluence (1), pancreatic tumor (2); B) vascular graft already positioned before unclamping: portal vein (1), tubular graft of abdominal rectum (2), superior mesenteric vein (3); C) final graft.

Vascular invasion, which is commonly found during the diagnosis of tumors in the head and body of the pancreas, is currently an indication for neoadjuvant treatment.[1] Afterwards, surgery with vascular resection may also be indicated to obtain macroscopically negative margins.[2]

Occasionally, vascular reconstruction cannot be performed by primary anastomosis, which requires the use of a prosthetic or autologous graft. For autologous grafts, the left renal or jugular veins are the most suitable options available for the reconstruction of the mesenteric-portal axis, as they have a similar diameter.[3] Likewise, the falciform ligament[4] and peritoneum are suitable for partial venous resections, and the posterior sheath of the anterior rectus muscle of the abdomen is useful as a tubular graft after complete circumferential venous resections, where a long venous segment must be replaced.[5] However, synthetic prostheses made of polytetrafluoroethylene (PTFE) and Dacron are the most commonly used today, with minimal risk of liver necrosis or graft infection.[6–8]

We present two clinical cases in which resection of the splenomesenteric-portal venous confluence and pancreatic neoplasm was performed, followed by a venous reconstruction using an autologous tubular graft of the peritoneum and posterior sheath of the rectus abdominis muscle.

Case 1. (Fig. 1) A 51-year-old female patient diagnosed with a locally advanced head of the pancreas cancer by abdominal computed tomography (CT), measuring about 25 × 25 mm, with invasion of the spleno-portal confluence and intrapancreatic bile duct. Endoscopic ultrasound was performed for a histological study, which was compatible with adenocarcinoma.

Initially, neoadjuvant treatment was performed by chemoradiotherapy. Follow-up CT scan to monitor the response showed that the disease remained stable, so surgical rescue was indicated. This was initiated with a pancreaticoduodenectomy. Then, as it was impossible to identify the splenic vein at its mesenteric-portal confluence due to tumor involvement, we decided to perform total pancreatectomy with splenectomy and complete circumferential vascular resection of the splenomesenteric-portal confluence. The pathology results reported a moderately-differentiated adenocarcinoma with discontinuous invasion of the entire pancreas, duodenal wall invasion, perineural invasion and focal involvement of the vascular margin; none of the 15 isolated lymph nodes were affected; pT3pN0.

Case 2. (Fig. 2) Following an episode of acute prostatitis, a 63-year-old male patient was diagnosed with pancreatic cancer, which was initially identified by ultrasound as a hypodense image, defined mL, 18 × 14 mm. The study was completed with a CT angiogram and pancreatic magnetic resonance imaging, which reported a cystic tumor in the head of the pancreas, causing pancreatic duct ectasia in the body

and tail, with multiple lymphadenopathies. The lesion was in close contact with the first part of the duodenum, with no other observed lesions suggestive of metastasis. After assessment by the multidisciplinary committee, the patient was considered a candidate for surgery with curative intent. During the operation, a locally advanced mass was observed with a lymphadenopathy conglomerate that invaded the portal vein and splenomesenteric confluence. Given these findings, we decided to perform total pancreatectomy with cholecystectomy, splenectomy and portal resection. The definitive pathology results identified a moderately differentiated intestinal adenocarcinoma, with extramural venous invasion and extensive perineural permeation; pT3N1.

In both cases, vascular reconstruction was carried out with *en bloc* resection of the peritoneum and posterior sheath of the rectus abdominis muscle, in accordance with the technique described by Elias et al.[9] The peritoneal side was marked so that it remained oriented towards the inside of the graft, then the graft was introduced in a 2.5% glutaraldehyde solution for 5 min to solidify the piece, followed by rinsing in saline twice for 2 min. This procedure facilitates handling and reduces the risk of collapse once the graft is in place. To make the tubular graft, it was placed around a rectal probe (CH 32) of a diameter similar to that of the vessel to be reconstructed, to be then sutured laterally with a linear stapler and a vascular cartridge. Placement was performed using two continuous semicircular sutures of Prolene 4/0 and growth factor on the vessel wall, both at the proximal and distal ends.

Both patients presented correct postoperative recovery and were discharged with only low-molecular-weight heparin at prophylactic doses (which they had also received during hospitalization) during the first postoperative month (subcutaneous enoxaparin, 40 mg every 24 h). In both cases, a follow-up CT was performed one month after surgery, which showed correct graft function.

Autologous tubular graft of the peritoneum and posterior sheath of the abdominal rectus muscle is a feasible, safe and accessible alternative in cases requiring resection and vascular reconstruction in pancreatic surgery. This is especially true in unplanned cases, as in Case 2, in which the vascular involvement was not evident in the preoperative study and was an intraoperative finding.

The advantages of the technique are that it is available, is easy to obtain without the need to sacrifice an autologous jugular or renal vein, has a low risk of infection, requires no long-term anticoagulant treatment and is low in cost.

REFERENCES

1. Mollberg N, Rahbari NN, Koch M, Hartwig W, Hoeger Y, Büchler MW, et al. Arterial resection during pancreatectomy for pancreatic cancer: a systematic review and meta-analysis. Ann Surg. 2011;254(6):882–93. http://dx.doi.org/10.1097/SLA.0b013e31823ac299.
2. Khan AaamirZ, Smith Andrew M. Portal vein resection during pancreaticoduodenectomy for cancer. Ann R Coll Surg Engl. 2009;91:95–9. http://dx.doi.org/10.1308/003588409X392045a.
3. Balzan S, Gava V, Magalhaes M, Schwengber A, Dotto M. The use of autologous peritoneal grafts for vascular reconstruction. Off J Int Hepato-Pancreato-Biliary Assoc (IHPBA). 2016;18(S1):e385–601.
4. Zhiying Y, Haidong T, Xiaolei L, Yongliang S, Shuang S, Liguo L, et al. The falciform ligament as a graft for portal-superior mesenteric vein reconstruction in pancreatectomy. J Surg Res. 2017;218:226–31. http://dx.doi.org/10.1016/j.jss.2017.05.090.
5. Dokmak S, Aussilhou B, Sauvanet A, Nagarajan G, Farges O, Belghiti J. Parietal peritoneum as an autologous substitute for venous reconstruction hepatopancreatobiliary surgery. Ann Surg. 2015;262:366–71. http://dx.doi.org/10.1097/SLA.0000000000000959.
6. Chu CK, Farnell MB, Nguyen JH, et al. Prosthetic graft reconstruction after portal vein resection in pancreaticoduodenectomy: a multicenter analysis. J Am Coll Surg. 2010;211:316–24. http://dx.doi.org/10.1016/j.jamcollsurg.2010.04.005.
7. Stauffer JA, Dougherty MK, Kim GP, et al. Interposition graft with polytetrafluoroethylene for mesenteric and portal vein reconstruction after pancreaticoduodenectomy. Br J Surg. 2009;96:247–52. http://dx.doi.org/10.1002/bjs.6483.
8. Illuminati G, Calio' FG, D'Urso A, et al. Prosthetic replacement of the infrahepatic inferior vena cava for leiomyosarcoma. Arch Surg. 2006;141:919–24. http://dx.doi.org/10.1001/archsurg.141.9.919.
9. Elias D, Honoré C, Dumont F, Goéré D. Autologous peritoneo-fascial graft: a technique for vascular reconstruction. Département de Chirurgie Générale Oncologique, Gustave-Roussy, Cancer Campus Grand Paris. J Visceral Surg. 2014;151(December (6)):461–4. http://dx.doi.org/10.1016/j.jviscsurg.2014.09.007.

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