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<http://dx.doi.org/10.1016/j.cireng.2022.12.005>
2173-5077/

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Adenomyomatous hiperplasia of the vaterian system

Adenomiomatosis de ampolla de Váter



Benign obstructive pathologies of the ampulla of Vater are rare. Among them, adenomyomatous hyperplasia of the ampulla of Vater is an exceptional lesion, with fewer than 60 cases published in the literature. Its importance lies in the fact that, as it presents as bile duct obstruction, it is difficult to differentiate from malignant pathology, and in most cases the finding is made after pancreatoduodenectomy.¹ Bravet described the first adenomyomatosis of the ampulla of Vater in 1913.

We present the clinical case of a 76-year-old woman who underwent Nissen-Rossetti Fundoplication in 2014 due to gastroesophageal reflux disease. During follow-up, the patient described dyspepsia and abdominal discomfort. Abdominopelvic computed tomography (CT) scan revealed dilatation of the pancreatic duct along the head of the pancreas; the pancreas presented morphology without alterations. Magnetic resonance and CT scan showed dilatation of the pancreatic duct (Fig. 1B), with no apparent cause. CEA and CA 19.9 levels were not elevated.

Endoscopic retrograde cholangiopancreatography (ERCP) with sphincterotomy was performed, revealing a dilated pancreatic duct with abrupt club-like amputation and no

observed intraluminal tumors. Cytology showed indeterminate epithelial atypia. We decided to complete the study with endoscopic ultrasound and biopsy, which provided inconclusive findings.

During exploratory laparotomy, a tumor measuring approximately 1 cm was found close to the ampullary complex associated with multiple lymphadenopathies. Initially, we considered conducting ampullectomy, but because pancreatic duct reconstruction was impossible and the macroscopic appearance of the lesion was suspicious for malignancy, we decided to perform a pancreaticoduodenectomy with antrectomy and Roux-en-Y reconstruction, especially given the patient's history of gastroesophageal reflux.

The pathological result was benign reactive hyperplasia of the bile ducts that presented smooth muscle fascicles at the ampulla of Vater, a finding that corresponded with adenomyomatosis of the ampulla (Fig. 1A).

During the postoperative period, the patient presented complications, specifically grade A pancreatic fistula and grade C delayed gastric emptying (Clavien Dindo grade II), which were managed conservatively and progressed adequa-

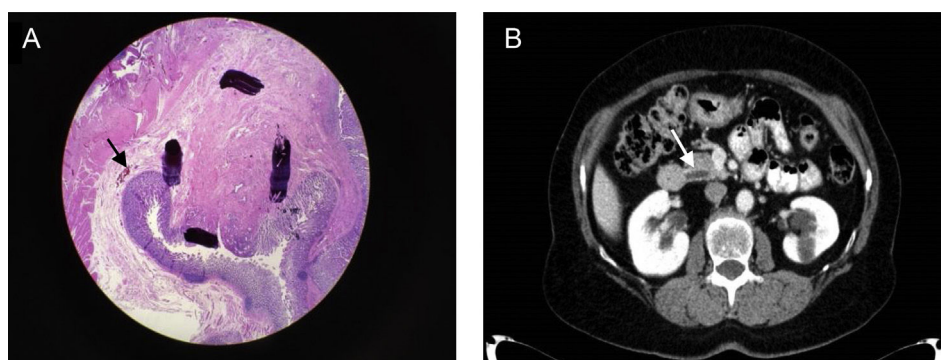


Figure 1 – A. Reactive hyperplasia of peribiliary glands; areas of erosion and polypoid inflammatory granulation tissue without dysplasia. B. Dilatation of the pancreatic duct.

Table 1 – Reports of cases in literature of adenomyomatosis of Wirsung's duct.

Reference	Age	Sex	Symptoms	Analytical alterations	Complementary tests	Pre-/intra operative cytology	Treatment/management
Huang HL et al. Xue Za Zhi (Taipei). 1993;51(5):386–8.	63	Male	Abdominal pain, acholia, choluria	NS	Tumor of the ampulla of Vater	Not done	Local resection
Ligorred L et al. Rev Esp Enferm Dig 1997; 89 (5): 411–2.	76	Female	Jaundice of skin/mucous membranes, pruritus and abdominal pain	Mild cholestasis (Bilirubin 1.4 mg/dL) and cytolysis	CT: dilated common bile duct (12 mm, no cause) ERCP: Dilatation of the common bile duct (20 mm) ERC: 5 mm tumor	Not done	Ampullectomy
Hammarström LE et al. Surg Laparosc Endosc 1997; 7 (5): 388–93.	54	Female	Recurrent biliary colic, obstruction of the biliary duct on several occasions	NS	ERC: distal stenosis and tumor in the ampulla	Not done	Transduodenal sphincteroplasty
Hammarström LE et al. Surg Laparosc Endosc 1997; 7 (5): 388–93.	55	Female	Recurrent biliary colic, obstruction of the bile duct on one occasion	NS	NS	Not done	Endoscopic resection
Hammarström LE et al. Surg Laparosc Endosc 1997; 7 (5): 388–93.	48	Male	Recurrent biliary colic, obstruction of the biliary duct and cholangitis	NS	NS	Not done	Endoscopic sphincterotomy
Hammarström LE et al. Surg Laparosc Endosc 1997; 7 (5): 388–93.	82	Female	Biliary colic and cholangitis	NS	NS	Not done	Endoscopic sphincterotomy
Narita T et al. Ann Diagn Pathol 1999; 3: 174–177	73	Female	Jaundice of skin & mucous membranes	NS	US: Dilatation bile duct 15 mm	Not done	PD
Kalil A et al. Rev Col Bras Cir 2000; 27 (2): 138–9.	18	Female	Jaundice, Abdominal pain, constitutional syndrome	Cholestasis (direct bilirubin 26 mg/dL), elevated GOT, GPT and GGT	CT: mass in the ampulla of Vater CT: Dilatation of the common bile duct (17 mm)	Not done	PD
Kayahara M et al. Dig Sur 2001; 18 (2): 139–42.	42	Female	Abdominal pain	Elevated GOT and GPT (63 IU/L and 113 IU/L), GGT 174 IU/L. Elevated elastase 1	IOC: Periapillary mass (20 mm) ERCP: Abnormal periampullary shadow IOC: No passage of contrast to the duodenum and dilatation of the common bile duct CT: Dilatation CB and mass in AV	Papilla biopsy: Mucosal hyperplasia Intraoperative biopsy: Adenomyomatosis of the ampulla Intraoperative biopsy ruled out malignant disease.	Exploratory laparotomy: papillotomy and sphincterotomy
Bedirli A et al. Surg Today 2002; 32 (11): 1016–8.	63	Male	Epigastric tumor (associated renal tumor)	Cholestasis (Bilirubin 4.2 mg/dL and FA 397IU/L)	ERCP: Dilatation of the common biliary duct and pancreatic duct CT: Dilatation of the IBV and common bile duct (17 mm)	Not done	Pancreatoduodenectomy
Bedirli A et al. Surg Today 2002; 32 (11): 1016–8.	51	Male	Jaundice of skin & mucous membranes	Cholestasis (direct bilirubin 11.7 mg/dL, AF 958 IU/L, GOT 60 IU/L, GPT 92 IU/L)	NS	Not done (brush cytology with atypical cells)	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	64	Male	Abdominal pain	NS	Heterogenous intra-ampullary lesion, 11 mm	Adenoma	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	61	Male	Epigastric pain and jaundice of skin & mucous membranes	NS	No lesions	Inflammatory changes	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	73	Male	Asymptomatic (renal tumor as incidental finding)	NS	Heterogenous intra-ampullary lesion, 21 mm; lithiasis in common bile duct	Adenocarcinoma	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	67	Female	Jaundice of skin & mucous membranes	NS	Intra-ampullary lesion, 15 mm	Adenoma	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	54	Female	Diarrhea (incidental)	NS	Intra-ampullary lesion, 20 mm	Adenoma	Pancreatoduodenectomy

Table 1 (Continued)

Reference	Age	Sex	Symptoms	Analytical alterations	Complementary tests	Pre-/intra operative cytology	Treatment/management
Handra et al. Mod Pathol 2003; 16: 530–536.	55	Male	Cholestasis	Cholestasis	Hypoechogenic intra-ampullary lesion, 15 mm	Severe dysplasia	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	71	Female	Pain in right hypochondrium	NS	Hyperchogenic intra-ampullary lesion, 15 mm	Muscle fibers and gland structure	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	78	Female	Jaundice of skin & mucous membranes y cholestasis	Cholestasis	Tumor in the head of the pancreas	Not done	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	49	Female	Pain in right hypochondrium	NS	NS	Gland hyperplasia and inflammatory changes	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	38	Female	Abdominal pain	NS	NS	Mild dysplasia	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	67	Female	Jaundice of skin & mucous membranes	NS	Distal sharpening in common bile duct wall	Not done	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	74	Male	Jaundice of skin & mucous membranes	NS	Heterogenous Intra-ampullary lesion 20 mm.	Not done	Pancreatoduodenectomy
Handra et al. Mod Pathol 2003; 16: 530–536.	72	Female	Asymptomatic (incidental finding after trauma injury)	NS	Intra-ampullary lesion 10 mm	Adenocarcinoma	Pancreatoduodenectomy
Aoun N et al. Abdom Imaging 2005; 30 (1); 86–9.	68	Male	Jaundice of skin & mucous membranes y Epigastric pain	NS	CT: Hypodense lesion in ampulla (17 × 20 mm) invading the duodenal lumen	Not done	PD
Aoun N et al. Abdom Imaging 2005; 30 (1); 86–9.	71	Male	Pain in right hypochondrium	NS	CT: hypointense lesion in ampulla (10 × 10 mm) and dilatation of pancreatic duct ERCP: distal stenosis of CBD	Not done	PD
Aoun N et al. Abdom Imaging 2005; 30 (1); 86–9.	66	Female	Epigastric pain	NS	CT: Adenomyoma 14 × 10 mm affecting duodenal lumen	Not done	PD
Aoun N et al. Abdom Imaging 2005; 30 (1); 86–9.	71	Female	Epigastric pain	NS	CT: lesion in ampulla (7 × 12 mm) ERCP: Complete obstruction of distal common bile duct and irregular wall	Not done	PD
Martínez et al. Rev. Esp Enferm Dig 2005; 97 (6): 460–461.	22	Male	Jaundice of skin & mucous membranes, pruritus y constitutional syndrome	Elevated liver enzymes (GPT 122IU/L) and direct bilirubin (4.5 mg/dL)	CT: Dilatation of IBD and common bile duct 10 mm associated with “stop” 2 cm until papilla. ERCP: distal stenosis 1 cm	Negative for malignancy	PD
Massom et al. APMIS 2006; 114 (7–8): 559–61.	73	Female	Nausea, vomiting and diarrhea	NS	CT: cystic lesion in uncinate process (18 × 12 mm) surrounded by normal pancreatic tissue	Intraoperative biopsy: uncertain malignant disease Biopsy by endoscopic ultrasound: 2 cell populations, one of epithelial cells that are benign in appearance and another with foci of atypia and necrosis	PD
Kwon et al. World J Gastroenterol 2007; 13 8209: 2892–4.	74	Female	Recurring acute pancreatitis	Elevated liver enzymes (GOT 47IU/L, GPT 102 IU/L), amylase (4290 IU/L) and lipase (1526 IU/L)	MRCP: Dilatation of the CBD and distal stenosis ERCP: nodular mass with granular and villous mucosa originating in the peripancreatic orifice	Proliferation of mucosa without atypia	Endoscopic resection of the lesion and argon coagulation of the mucosal remanent
Genevay et al. Gastrointest Endos 2009; 69 (6): 1167–8.	73	Male	Jaundice of skin & mucous membranes	Elevated bilirubin (17 mg/dl) and AF (997IU/L)	CT: Dilatation IBV ERCP: stenosis of CBD 40 mm in length	Brush cytology: No malignant disease	Pancreatoduodenectomy

Table 1 (Continued)

Reference	Age	Sex	Symptoms	Analytical alterations	Complementary tests	Pre-/intra operative cytology	Treatment/management
Lehwald N et al. J Med Case Reports 2010; 4 (1): 402.	42	Male	Nausea and vomiting	Tumor markers in normal range	CT: Mass in the head of the pancreas and duodenum, distal stenosis of the CBD	Intraoperative biopsy: cell atypia	Pancreatoduodenectomy
Higashi et al. J Hepato-biliary Pancreat Sci 2010; 17: 275–283.	67	Female	Jaundice of skin & mucous membranes	NS	NS	Suspected adenomyoma	Pancreatoduodenectomy
Higashi et al. J Hepato-biliary Pancreat Sci 2010; 17: 275–283.	78	Female	Asymptomatic	NS	NS	Not done	Pancreatoduodenectomy
Higashi et al. J Hepato-biliary Pancreat Sci 2010; 17: 275–283.	49	Male	Asymptomatic	NS	NS	Ampullary carcinoma	Pancreatoduodenectomy
Higashi et al. J Hepato-biliary Pancreat Sci 2010; 17: 275–283.	58	Female	Jaundice of skin & mucous membranes	NS	NS	Ampullary carcinoma	Pancreatoduodenectomy
Higashi et al. J Hepato-biliary Pancreat Sci 2010; 17: 275–283.	68	Male	Jaundice of skin & mucous membranes	NS	NS	Ampullary carcinoma	Pancreatoduodenectomy
Kumari et al. J Surg Rep 2011 (8):6.	58	Male	Abdominal pain	NS	US: CBD dilatation	NS	Pancreatoduodenectomy
Kumari et al. J Surg Rep 2011 (8):6.	65	Male	Jaundice of skin & mucous membranes	NS	US: CBD dilatation	NS	Pancreatoduodenectomy
Kumari et al. J Surg Rep 2011 (8):6.	81	Male	Hyporexia	NS	US: CBD dilatation and nodule in the ampulla (15 × 10 mm)	NS	Pancreatoduodenectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	70	Male	Abdominal pain	GOT (78IU/L) y FA (268IU/L)	CT: Focal lesion in ampulla of Vater and CBD dilatation (14 mm)	Endoscopic biopsy: adenomyoma	Endoscopic papillectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	71	Male	Abdominal pain	GPT (92IU/L), AF (493IU/L), Bilirubin (1.83 mg/dL)	Endoscopy: ampullary mass 15 mm with granular appearance Endoscopy: Ampullary mass measuring 12 mm	Endoscopic biopsy: adenomyoma	Endoscopic papillectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	72	Male	Asymptomatic	AF (180IU/L)	CT: defined ampullary nodule (15 × 12 mm) and CBD dilatation (13 mm) Endoscopy: ampullary mass 12 mm, with villous appearance	Endoscopic biopsy: Adenomyoma and dysplasia	Endoscopic papillectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	53	Male	Abdominal pain	AF (300IU/L), Bilirubin (1.46 mg/dL)	Endoscopy: lobulated lesion, 10 mm	Endoscopic biopsy: Adenomyoma and chronic inflammation	Endoscopic papillectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	75	Male	Asymptomatic (colorectal cancer)	FA (230IU/L)	CT: Focal lesion in ampulla of Vater and CBD dilatation (11 mm)	Endoscopic biopsy: Adenomyoma	Ampullectomy
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	75	Female	Asymptomatic	FA (251IU/L)	Endoscopy: Lobulated papilla CT: CBD dilatation (10 mm).	Endoscopic biopsy: Adenomyoma	Close radiological follow-up
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	64	Female	Asymptomatic	FA (178IU/L)	Endoscopy: lobulated papilla Endoscopy: CBD dilatation (10 mm) and lobulated papilla	Endoscopic biopsy: Adenomyoma	Close radiological follow-up
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	57	Female	Asymptomatic	AF (174IU/L), Bilirubin (1.02 mg/dL)	Endoscopy: Lobulated papilla	Endoscopic biopsy: proliferative epithelial atypia	Close radiological follow-up

Reference	Age	Sex	Symptoms	Analytical alterations	Complementary tests	Pre-/intra operative cytology	Treatment/management
Choi et al. Korean J Gastroenterol 2013; 62 (6): 352–358	65	Female	Asymptomatic	FA (273IU/L)	Endoscopy: Lobulated papilla	Endoscopic biopsy: Adenomyoma	Close radiological follow-up
Rafullah et al. BMJ Case Rep 2014.	61	Male	Acute pancreatitis	Elevated liver enzymes (GOT 190IU/L, GPT 169IU/L), AF (147IU/L), amylase (1855 IU/L) and lipase (285 IU/L)	CT: acute pancreatitis, peripancreatic lymphadenopathy and CBD dilatation (10 mm) with abrupt interruption in the head of the pancreas that resulted in mild dilatation of the pancreatic duct Endoscopic ultrasound: hypoechoic multilobulate density in the ampulla (24 × 21 mm)	Endoscopic biopsy: inflammatory polyp vs inflammatory changes on an undemonstrated neoplastic lesion	Endoscopic ampullectomy
Keegan et al. Gastrointest Endosc 2017; 86 (3): 568–9.	59	Male	Fatigue	GOT (160IU/L)	CT: Hypodensity in the ampulla of Vater (10 mm) Endoscopic ultrasound: Dilatation of EBD (11 mm) and hypoechoic lesion in the ampulla (13 mm)	Not done	Endoscopic ampullectomy
Gialamas et al. Int J Surg Pathol 2018; 26 (7): 644–8	58	Male	Jaundice and fatigue	Elevated liver enzymes and bilirubin (GOT 1008IU/L, GPT 1105IU/L, AF (153IU/L), GGT (154IU/L), direct bilirubin (21.6 mg/dL)	MRCP: distal stenosis of CBD at the ampulla of Vater with dilatation of 10 mm Endoscopic ultrasound: retroampullary mass	Endoscopic biopsy: cell atypia and chronic inflammation with no dysplasia	PD
Gouveia et al. GE Port J Gastroenterol 2021: 28: 121–133.	58	Male	Epigastralgia	(GOT 52IU/L, GPT 64IU/L),	Endoscopic ultrasound: 12 mm mass in ampulla encompassing duodenal wall	Endoscopic biopsy: epithelial cells, some with dysplasia, no characteristics of carcinoma	PD
Gouveia et al. GE Port J Gastroenterol 2021: 28: 121–133.	70	Female	Epigastralgia	(GOT 72IU/L, GPT 86IU/L),	CT: CBD dilatation (22 mm) MRCP: CBD dilatation with 1 cm stenosis at the ampulla Endoscopic ultrasound: CBD dilatation (16 mm) and poorly defined distal hypoechoic mass (15 × 19 mm)	Not done	PD
Fructuoso L et al.	74	Female	Lumbar pain (renal tumor)	No alteration of the liver profile	CT: nodular lesion measuring 15 mm causing CBD dilatation and pancreatic duct ectasia MRCP: dilatation of CBD and pancreatic duct with abrupt distal stenosis	Not done	PD

NS (not specified), CBD (common bile duct), IBD (intrahepatic bile duct), EBD (extrahepatic bile duct), CT (computed tomography), IOC (intraoperative cholangiography), ERC (endoscopic retrograde cholangiography), ERCP (endoscopic retrograde cholangiopancreatography), US (ultrasound), MRCP (magnetic resonance cholangiopancreatography).

tely. The patient was discharged on the tenth postoperative day without further incidents or long-term complications.

Benign tumors of the extrahepatic bile duct are very rare. According to the WHO classification, adenomyoma and adenomyomatous hyperplasia are defined as the same condition characterized by the presence of smooth muscle cell hyperplasia.¹

The incidence of this pathology is difficult to establish with certainty. A study of 100 autopsies by Dardinski in 1931 demonstrated a 50% incidence of adenomyomatosis of the ampulla of Vater as a histological finding, especially in elderly people.²

Regarding its pathophysiology, the bile duct has been described as having an epithelium similar to that of the gallbladder, where this pathology is much more frequent. Although this epithelium does not undergo constant changes in its diameter and structure, it can develop hyperplasia.³ Some theories include the proliferation and aberrant growth of muscle tissue as part of an involuting fibroadenomatous process secondary to aging.⁴

A total of 56 cases have been previously published: 28 women and 28 men (Table 1). The median age at diagnosis was 56 years. The most frequent reason for consultation was abdominal pain (43.1%), followed by jaundice (29.3%) and acute pancreatitis (3.4%), while 37.9% of patients were asymptomatic.⁵

Both preoperative and intraoperative diagnoses are complex. Only 8 patients did not undergo surgery, as the preoperative biopsy reported adenomyoma.⁶ In the remaining cases, since malignancy could not be ruled out, oncological surgery was performed.¹ It has been reported that ERCP biopsy cannot definitively rule out ampullary carcinoma, as the false negative rate is 16%–60%.⁷

Currently, certain immunohistochemical markers can complement the diagnosis. Ki67, cytokeratin 7 expression, and absence of cytokeratin 20 expression in epithelial cells could differentiate adenomyomatous hyperplasia from malignant neoplasms.¹⁰

In some patients in whom adenomyomatosis of the pancreatic duct was asymptomatic, other concomitant findings included renal tumors and colorectal cancer, although they were initially not related with this pathology.^{7,8}

The treatment of benign extrahepatic bile duct tumors is wide and diverse, ranging from endoscopic resections⁶ to oncological surgeries. In our review, we observed that most patients underwent surgeries with radical intent (like our patient) since preoperative studies could not rule out malignant disease.

To date, there is no standardized protocol for therapeutic intervention. Radical surgery continues to be the main approach, especially if the diagnosis of benignity has not been clearly established.^{9,10} Adenomyomatosis of the pancreatic duct is a rare benign pathology that is much less frequent than ampullary carcinoma.

It is expected that, by better understanding the general symptoms, a more accurate definition of the condition will be established, along with standardized management protocols

in order to avoid aggressive surgery as well as the postoperative morbidity and mortality that this entails.

Conflicts of interest

None of the authors have any conflicts of interest to declare.

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<http://dx.doi.org/10.1016/j.cireng.2023.03.001>
2173-5077/

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