

Duodenal Diverticulae

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Abstract

The duodenal diverticulum is a hernia of the duodenal wall. Its frequency varies from 2 to 20%. The symptomatic forms are rare but particularly serious because often revealed by a complication. The discovery is most often fortuitously on the occasion of a Cholangio Endoscopic Retrograde Pancreatography. The purpose of our work is to study the clinical endoscopic and therapeutic epidemiological aspects of duodenal diverticula. **Materials and methods:** This is a retrospective descriptive study conducted in the department of diseases of the digestive system "Medicine C" at Ibn Sina Hospital in Rabat. We collected all patients with duodenal diverticulum over a 12-year period (November 2005 to June 2016). Patient data were exploited from the Cholangio Endoscopic Retrograde Pancreatography (ERCP) registers. **Results:** Between November 2005 and June 2016, 664 ERCP were performed, 41 duodenal diverticula were observed; that is 6.2%. The average age of our patients was 68.6 years with extremes ranging from 38 to 85 years; 58.5% of the subjects were over 70 years of age with a clear predominance of women (34 women, 7 men) and one sex ratio F / H = 5. Clinical symptomatology was caused by cholestatic jaundice, cholangitis, acute pancreatitis. A liver test predominantly exhibited cytolysis associated with cholestasis. All our patients benefited from a radiological assessment including abdominal ultrasonography, CT, bili-MRI, echoendoscopy and Kehr drain cholangiography; the diagnosis of a lithiasis of the bile duct was raised in 80% of cases. ERCP performed in all our patients has a fortuitous discovery of duodenal diverticula. The characteristics of these diverticula were revealed by ERCP: a single diverticulum was observed in most cases (36 patients or 88%), two diverticula in 4 patients (10%) and three diverticula in one patient (2%). All the diverticula were juxta-papillary (at the level of D2). The papilla was paradiverticular in the majority of cases (30 patients, 73%), intradiverticular in 7 patients (17%) and interdiverticular in 4 patients (10%). The presence of duodenal diverticula had an impact on the feasibility of ERCP: catheterization of the papilla was difficult in 6 patients (14%) but managed in 8 patients (19%), 5 patients had paradiverticular papillary, 2 interdiverticular and one intradiverticular. Endoscopic treatment of bilio-pancreatic pathology associated with duodenal diverticula was performed in 23 patients: 16 patients underwent computed extraction of the hand bile duct. Seven patients were referred to surgery. **Conclusion:** The duodenal diverticulum is the second most common site of digestive diverticula after the colon. The absence of specific signs makes the positive diagnosis difficult.

Keywords: duodenal diverticulum, hernia, duodenal wall.

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INTRODUCTION

The duodenal diverticulum (DD) is an anatomical anomaly that consists of a herniated duodenal wall. Described for the first time in 1710 by Chomel [1]. Its frequency varies from 2 to 20%. Often asymptomatic; The diagnosis is most often made during a complication: digestive hemorrhage, perforation in free peritoneum or retroperitoneum, cholangitis, acute pancreatitis [2]. The treatment is surgical reserved for complicated forms; The endoscopic means of endoscopic sphincterotomy thus allows a significant reduction of morbi-mortality [3, 4].

A retrospective series of 41 patients with duodenal diverticulum, with a review of the literature,

we shed light on the epidemiological, diagnostic and therapeutic aspects of this pathology. We also emphasize the importance of endoscopic sphincterotomy in this pathology.

MATERIALS AND METHODS

This is a retrospective descriptive study conducted in the department of diseases of the digestive system "Medicine C" at Ibn Sina Hospital in Rabat. We collected all patients with duodenal diverticulum over a 12-year period (November 2005 to June 2016). Patient data were exploited from the Endoscopic Retrograde CholangioPancreatography (ERCP) registers.

Epidemiological, clinical, biological and radiological data were used. The ERCP was made in all our patients and allowed the determination of the characteristics of the duodenal diverticula: Some associated therapeutic gestures have been made

RESULTS

Between November 2005 and June 2016, 664 ERCP were performed, 41 duodenal diverticula were observed; that is 6.2%. The average age of our patients was 68.6 years with extremes ranging from 38 to 85 years; 58.5% of patients were older than 70 years old with a clear predominance female (34 women, 7 men) and one sex ratio F / H = 5. Clinical symptomatology was strongly represented by cholestatic jaundice, cholangitis, acute pancreatitis (Figure-1). A liver test predominantly exhibited cytolysis associated with cholestasis. All our patients benefited from a radiological assessment including abdominal ultrasonography, CT, bili-MRI, echoendoscopy and Kehr drain cholangiography; The diagnosis of LVBP was raised in 80% of cases (Figure-2). ERCP performed in all our patients has a fortuitous discovery of duodenal diverticula. The characteristics of these diverticula were revealed by ERCP: a single diverticulum was observed in most cases (36 patients or 88%), two diverticula in 4 patients (10%) and three diverticula in a single patient (2%). All the diverticula were juxta-papillary (at the level of D2). The papilla was paradiverticular in the majority of cases (30 patients, 73%), intradiverticular in 7 patients (17%) and interdiverticular in 4 patients (10%). The presence of duodenal diverticula had an impact on the feasibility of ERCP: catheterization of the papilla was difficult in 6 patients (14%) but managed after several attempts, impossible in 8 patients (19%), 5 patients had a paradiverticular papilla (Figure 3), 2 interdiverticular and one intradiverticular-. Endoscopic treatment of bilio-pancreatic pathology associated with duodenal diverticula was performed in 23 patients: The

presence of duodenal diverticula had an impact on the feasibility of ERCP: catheterization of the papilla was difficult in 6 patients (14%) but managed after several attempts, impossible in 8 patients (19%), 5 patients had a paradiverticular papilla (Figure-3), 2 interdiverticular and one intradiverticular. Endoscopic treatment of bilio-pancreatic pathology associated with duodenal diverticula was performed in 23 patients:

Extraction of endoscopic sphincterotomy (ES) calculated in 16 patients with primary bile duct lithiasis.

Placement of a biliary prosthesis in 2 patients with low bile duct stenosis: a plastic prosthesis in a patient and a non-covered metal in the second.

- Dilation of a biliary stenosis in a patient with pre-ampullary biliary stenosis.
- Placement of a plastic biliary prosthesis in a patient with metastatic pancreatic head cancer.
- Placement of a plastic biliary prosthesis and a pancreatic prosthesis in 2 patients.
- Washing of VBP with hydration of membranes by balloon and placement of a naso-cystic drain in a patient with a hydatid cyst of the liver (KHF) broken in the bile ducts.

In 7 patients with suspected lithiasis of VBP on imaging, the stones were not found at ERCP. 7 patients were admitted to the surgery:

- Failure of VBP catheterization in two patients.
- Failed to extract stones from two patients.
- Bypedocenic stenosis impassable by the guidewire in a patient.
- Suspected perforation of duodenal diverticulum in a patient.
- Surgical management of cystic dilation of the common bile duct in a patient.

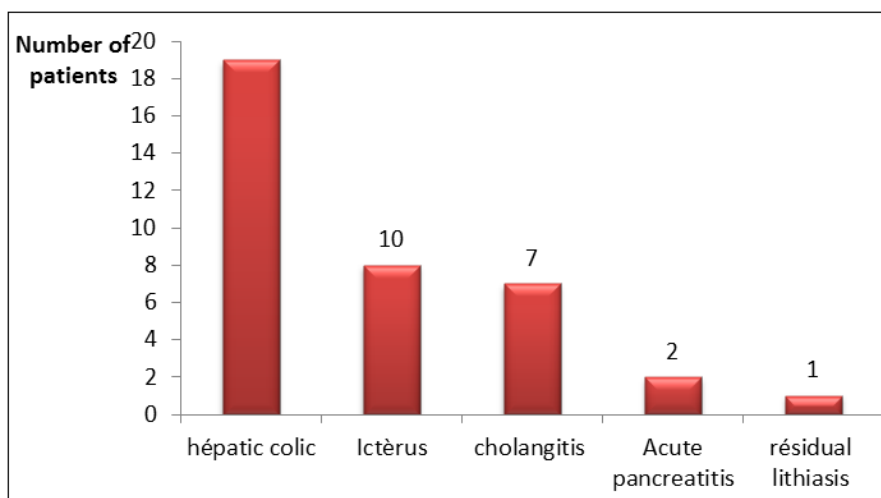


Fig-1: Clinical Symptoms

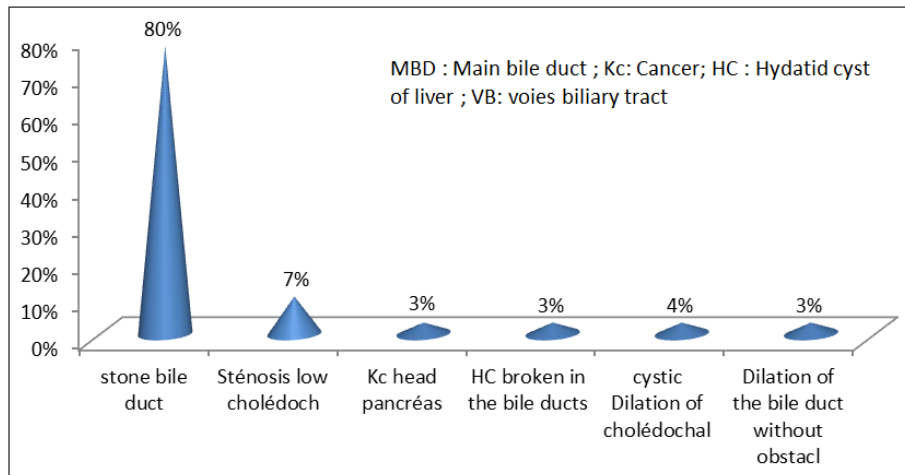


Fig-2: Résultats of the radiological assessment



Fig-3: Endoscopic view of a large parapancreatic duodenal diverticulum (Iconography Medecine C, Pr Essaid)



Fig-4: Endoscopic view of a parapancreatic duodenal diverticulum (Iconography Medecine C, Pr Essaid)

The duodenal diverticula represents the 2nd localization of the gastrointestinal tract diverticulum after the colon. [5]. They are present in 62% of cases of the second duodenum (D2) mainly around the papilla, in 30% of the cases of the 3rd duodenum (D3) and in 8% of the cases the 4th duodenum (D4) [6]. In our series, all patients had juxta-papillary diverticula.

The age of discovery is generally beyond 40 years, and 60% of patients are about 70 years old [6], with no predominance of sex. The average age of our patients was 68.6 years and 58.5% of the patients were

over 70 years old, with a clear female predominance. There are two types of duodenal diverticula: acquired diverticulum, extraluminal, and congenital, intraluminal diverticula [2].

Extraluminal duodenal diverticula are asymptomatic in 95% of cases. When they become symptomatic (5% of cases), the diverticula are most often revealed by bilio-pancreatic complications, such as acute cholangitis or pancreatitis, most often related to stones or choledochal duct. Associated with the duodenal diverticulum. Other, rare complications may

reveal extraluminal duodenal diverticula, such as diverticulitis, perforation or gastrointestinal bleeding [5]. In our series, patients mainly reported for bilio-pancreatic manifestations: Several endoscopic studies have demonstrated the existence of a link between juxta-papillary diverticula and cholelithiasis. Fritsch *et al.*, [7], In a retrospective study of 520 patients with ERCP showed that VBP lithiasis is more common in the case of diverticulum: a juxta-papillary diverticulum was observed in 40% of patients who had a VBP lithiasis and only 10.2% of those who did not have one. In addition, the majority of the stones extracted from the VBP were pigmentary and brown, which testified to the role of stasis in VBP in their formation [7]. In our series,

In the study by CW Kim *et al.*, [8], the incidence of acute non-lithiasis angiocholitis in patients with juxta-papillary diverticula was 7.3%. In our series, 7 patients presented with angiocholitis, representing 17% of patients with duodenal diverticulum, including only one case where cholangitis was not of lithiasis origin (normal ERCP).

Cases of acute pancreatitis in patients with juxta-papillary diverticula have been reported. In a study of 470 patients with ERCP, 26% of patients with juxta-papillary diverticula had recurrent acute pancreatitis or chronic pancreatitis, compared with 14% of patients without diverticula ($p < 0.05$) [9]. According to the authors, these cases of acute pancreatitis are essentially related to a lithiasic biliary origin [10]. But cases of acute pancreatitis "non-lithiasis" in the presence of juxta-papillary diverticula have been described. In our study two patients presented with pancreatitis, whose origin was lithiasic in a patient, while in the second was a rupture of a hydatid cyst of the liver in the bile ducts.

The presence of a duodenal diverticulum increases the difficulty of catheterizing the disc, and is a major cause of ERCP failure, especially in patients with an intradiverticular papilla compared with juxtapapillary diverticula [11, 12], but the rate of permanent failure remains low, estimated between 2 and 4% [5]. 94.2 and 97% in the case of juxta-papillary diverticula [13, 14]. Other studies have shown a similar success in patients with or without duodenal diverticula [15, 16]. In our series, the failure rate of catheterization was 22% (6 out of 27 CPR performed).

Park *et al.*, [17] proposes to perform an infundibulotomy as an alternative to improve the success rate of bile duct catheterization in patients with juxta-papillary diverticulum with difficulty catheterization of VBP. He states that the success rate of needle-knife infundibulotomy in patients with juxta-papillary diverticulum with failure of papilla catheterization was not inferior to that of patients without diverticula (93.9% vs. 88%), 4%, $p = 0.525$).

This technique has been used in two patients with initial failure of papillary catheterization, and is available to VBP in both patients. According to Park, this success of the infundibulotomy was due to several reasons: the deficit (or insufficiency) of the sphincter of oddi allows a better exposure of the biliary light through the papilla [18].

Once the papilla is catheterized, it does not appear that the presence of a diverticulum increases the rate of endoscopic sphincterotomy (ES) [15].

There was no significant difference in ERCP morbidity and mortality in patients with and without duodenal diverticula [15, 19]. The morbidity and mortality rates were 5.2 and 0.9% versus 4 and 0.7% in patients with and without juxta-papillary diverticula respectively [15].

The fortuitous discovery of an asymptomatic duodenal diverticulum requires no treatment. The risk of symptoms or complications is very low, between 1 and 5% [5]. Only symptomatic or complicated duodenal diverticula should be treated.

Endoscopic sphincterotomy is the procedure usually proposed for bilio-pancreatic complications related to juxta-papillary diverticula (angiocholitis with or without associated lithiasis, recurrent acute pancreatitis, intradiverticular bezardous cholestasis) [20]. Thus, for a main bile duct lithiasis associated with a juxta-papillary duodenal diverticulum, it is proposed to first-line endoscopic sphincterotomy with extraction of VBP stones, then remote laparoscopic cholecystectomy [5]. In our series, 23 patients benefited from endoscopic procedures per-ERCP, according to the etiology found, which remains dominated mainly by VBP calculations.

CONCLUSION

Duodenal diverticula are often fortuitous discovery during ERCP. The endoscopist must be armed and heightened the possibility that he would have to solve the papillary sphincterotomy.

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