CASE REPORTS
PRIKAZI SLUČAJEVA

Clinical Center of Vojvodina, Institute of Internal Medicine, Department of Gastroenterology and Hepatology, Novi Sad

DUODENAL DIVERTICULUM ASSOCIATED WITH PANCREATITIS – A CASE REPORT

DIVERTIKULUM DUODENUMA UDRUŽEN SA PANKREATITISOM – PRIKAZ SLUČAJA

Ivan BUSARČEVIĆ

Summary
Introduction. Acute pancreatitis is usually caused by biliary lithiasis and alcohol consumption. Pancreatitis in the elderly is a problem of increasing occurrence. Anatomic abnormalities may represent a less frequent, but important etiological factor. The duodenal diverticula rarely produce signs of inflammation, obstruction, hemorrhage or perforation. In some cases secondary biliary-pancreatic complications are found when a diverticulum originates from the papilla of Vater. Case Report. This case report describes a patient diagnosed with duodenal diverticulum who developed a framework of abdominal pain and laboratory findings compatible with acute pancreatitis which occurred two times in a short period of time. Conclusion. The association of duodenal diverticulum and acute pancreatitis has been reported, but it is important to point out that anatomic abnormalities may represent a less frequent but important etiological factor for acute pancreatitis.

Key words: Diverticulum; Duodenal Diseases; Pancreatitis; Ampulla of Vater; Digestive System Abnormalities; Signs and Symptoms; Risk Factors; Aged

Sažetak
Akutni pankreatitis je obično posledica dobro poznatih uzroka kao što su bilijarni konkrementi i konzumacija alkohola. Pankreatitis kod starijih osoba je sve zastupljeniji i to predstavlja problem. Anatomske promene predstavljaju redi, ali važan, etiološki faktor. Duodenalni divertikulum retko izaziva znake poput inflamacije, opstrukcije, hemoragije ili perforacije. U nekim slučajevima se u drugim bilijarno-pankreatičnim komplikacijama javlja ukoliko je divertikulum u neposrednoj blizini papile Vateri. Prikaz slučaja. Rad prikazuje slučaj pacijentkinje sa dijagnostikovanim duodenalnim divertikulumom kod koje se dva puta u kratkom vremenskom periodu javio bol u trbuhu a laboratorijski nalazi ukazivali su na akutni pankreatitis. Zaključak. Udruženost duodenalnog divertikuluma i akutnog pankreatitisa poznata je od ranije ali je važno istaći da anatomske promene predstavljaju redi, ali pojavljivanje važan, etiološki faktor akutnog pankreatitisa.

Ključne reči: divertikulum; oboljenja duodenuma; pankreatitis; Vaterova ampula; abnormalnosti digestivnog sistema; znaci i simptomi; faktori rizika; stari ljudi

Introduction
Duodenum is the second most common site of diverticulum formation after colon. The incidence of duodenal diverticula varies, from 1 – 6% in upper gastrointestinal contrast studies, 12 – 27% in endoscopic studies, and up to 22% in postmortem findings [1]. Duodenal diverticulum was first reported by a French pathologist, Chomel in 1710 [2] and diagnosed radiologically by Case [3] in 1913. Most of the duodenal diverticula occur in the periampullary region, within 2.0 cm of the ampulla of Vater [4]. Even though some studies report no gender predisposition [5–7], Grant Boileau [8] reported two diverticula in 11 female subjects, compared to 13 from 122 male subjects. In Case’s [3] series of 85 cases of duodenal diverticula, 60% occurred in females. Mackenzie et al. [9] have also reported a female preponderance, female to male ratio of 1.6 to 1. Duodenal diverticula are asymptomatic in 90% of cases, less than 10% of patients develop nonspecific clinical symptoms like abdominal pain or discomfort [10]. The diagnosis of duodenal diverticula is incidental, found only during other diagnostic or therapeutic procedures. However, 6.5% of patients may develop complications [11] which include common bile duct obstruction, acute or chronic recurrent pancreatitis, partial duodenal obstruction, diverticulitis, ulceration, hemorrhage, enterolith formation, malignant degeneration, and perforation [12].

Case Report
An 85-year-old female was admitted to the Department of Gastroenterology and Hepatology with...
a two day history of dull epigastric pain radiating to the flanks and lower abdomen. The pain was associated with episodes of vomiting and chills. She had a history of similar painful episodes occurring infrequently during a few years, but the pain had never been so severe. She had never previously sought medical attention and treatment for such symptoms. Her past medical history was positive for hypertension and appendectomy at the age of 20. She was a non-smoker, and did not consume alcohol. The abdomen was soft, no masses were felt, while tenderness on deep palpation was evident on physical examination. The patient was given nil per mouth while workup for abdominal pain was started. Her pancreatic enzymes were found to be elevated: amylase level was 974 IU/L (reference value: less than 118 IU/L) and the lipase level was 720 U/L (reference value: less than 78U/L). Liver enzymes were mildly elevated: gamma-glutamyl transferase (GGT) 62 U/L (< 38), aspartate aminotransferase (AST) 68 (< 37), alanine aminotransferase (ALT) 138 U/L (< 48), alkaline phosphatase (ALP) 313 U/L (< 290), while bilirubin was within the reference range. Serum lipid values determined on the second day of hospitalization were in the reference ranges. Upper abdominal ultrasound showed no abnormalities, gallbladder was without gallstones or other pathology. A computed tomography (CT) scan of the abdomen was performed on the fifth day of admission.

The common bile duct was dilated up to 15.32 mm without intraluminal content (Figure 1). Pancreas was of normal size, clear contours, and of homogeneous structure (Figure 2), without dilation of the main pancreatic duct. The CT also showed that common bile duct dilatation was the consequence of the compression of diverticulum near the site of papilla of Vater (Figure 1). Upper gastroduodenal endoscopy revealed diverticular opening near the site of ampulla of Vater (approximately 1.2 cm in diameter and depth around 1 cm). The overlying mucosa appeared normal. While these examinations were being carried out, the patient underwent clinical treatment with parenteral hydration, third generation cephalosporin (ceftriaxone), H2 (histamine-2) blocker (ranitidine) and symptomatic therapy. The treatment provided suggestive regression of the acute-phase symptoms. The abdominal pain and vomiting resolved quickly after intravenous fluids were given, and within nine days the patient was discharged. The laboratory test results have improved as follows: amylase level was 90 IU/L (reference value: less than 118 IU/L) and the lipase level was 44 U/L (reference value: less than 78U/L), GGT 43 U/L (< 38), AST 21 (< 37), ALT 36 U/L (< 48), ALP 97 U/L (< 290). The patient was well for one week and then required readmission with a further bout of pancreatitis, amylase 1975 IU/l, GGT 210 U/l (< 38), AST 288 (<37), ALT 75 U/l (<48), ALP 202 U/l (< 115). The initial upper abdominal ultrasound showed hypoechocic body of pancreas, dilatation of the common bile duct up to 13 mm without intraluminal content and gallbladder with no gallstones or other pathology.

A control upper abdominal ultrasound confirmed dilatation of intra and extrahepatic biliary ducts, while a small amount of suspected intraluminal bile content was detected in the gallbladder. The values of oncomarkers (Ca 19-9 and carcinoembryonic antigen (CEA)) were in the normal range. The case was presented to an abdominal surgeon, a continuation of conservative therapy was proposed over the next ten days, after which decisions

**Abbreviations**

GGT – gamma-glutamyl transferase  
AST – aspartate aminotransferase  
ALT – alanine aminotransferase  
ALP – alkaline phosphatase  
CT – computed tomography  
JDD – juxtapapillary duodenal diverticulum

**Figure 1.** CT scan of the abdomen. A) Periampullary diverticulum (white arrow) and B) consequent extrahepatic bile ducts (common hepatic duct and common bile duct) dilatation (black arrow)

**Slika 1.** Kompjuterizovana tomografija abdomena. A) Periampularni divertikulum (bela strelica), B) Posledična dilatacija ekstrhepatičnih žučnih kanala (zajednički jetreni kanal i zajedničku žučni kanal) (crna strelica)

**Figure 2.** CT scan of the abdomen. Normal size, clear contours and homogenous structure of pancreas marked with arrows

**Slika 1.** Kompjuterizovana tomografija abdomena. Normalna veličina, jasne konture i homogena struktura pankreasa (obeležena strelicama)
on further treatment modalities were to be made. Following this period, a continuation of conservative treatment was proposed as well as further outpatient examinations by the gastroenterologist. The last gastroenterological control was four months after discharge from the hospital after which the patient continued receiving the previously recommended therapy: proton pump inhibitor and capsules of Ursodalk (ursodeoxycholic acid).

Discussion

We presented a case of an older woman with two episodes of pancreatitis in a short period of time caused by duodenal diverticulum near the site of papilla of Vater. Diverticula occur at weak spots in the duodenal wall such as the site of entry of the common bile duct, pancreatic duct and perivascular connective tissue sheath. The exact etiology is not clear; however, it might be the end result of disordered duodenal motility. Advancing age, progressive weakening of intestinal smooth muscles and increase in intraduodenal pressure may all encourage the outpouching of the duodenum [13]. Reported complications include hemorrhage from ulceration within diverticula [14] and cholangitis [15] or pancreatitis [16] which are thought to occur as a result of occlusion of the respective duct by an enlarging pouch [17]. The prevalence of juxtapapillary duodenal diverticula (JDD) in the general population is around 20%; they are often associated with biliary lithiasis. Patients with JDD have bile duct stones alone more often than patients without JDD (44% vs. 24%) [18]. In gallbladder of our patient, on the control abdominal ultrasonography during the second hospitalization, a small amount of suspected intraluminal bile content was detected. In various studies, upper gastrointestinal endoscopy has been shown to be a useful diagnostic tool; however, if the diverticula are located in the third or fourth part of the duodenum, then the sensitivity decreases [19]. It has been shown that there is an association between periampullary diverticula, which can lead to abscess formation, and biliary duct stones. Thus, in a patient suffering from pancreatitis with dilated bile ducts but no gallstones, the diagnosis of peripancreatic abscess should be considered. Radiological diagnosis of these abscesses can be difficult [20].

The CT and magnetic resonance imaging scans are useful to distinguish between abscesses and neo-plasms of the pancreas arising from the head of the pancreas by demonstrating characteristic air-fluid levels within these lesions [21, 22].

Surgical or endoscopic interventions should only be reserved for symptomatic diverticulum [23]. Furthermore, only 50% of patients treated with diverticulectomy were relieved of their symptoms [23, 24]. There is a consensus that elective surgical treatment of asymptomatic or minimally symptomatic diverticulum is not justified [13]. The existence of JDD influences bile duct diameter regardless of the presence of bile duct stones [18]. Classifying the severity of acute pancreatitis is important when comparing different institutional experiences, when talking with patients about prognosis, when planning therapy, and when comparing the new methods of management. New classification defines 3 degrees of severity; mild, moderately severe, and severe acute pancreatitis. Mild acute pancreatitis usually resolves within several days to a week, moderately severe acute pancreatitis resolves more slowly; may require interventions, and prolongs hospitalization; severe acute pancreatitis demands a longer hospital stay, usually some form of intervention, and may also be associated with multiple organ failure and death [25]. In order to establish the cause of the disease and prevent complications it is important to exclude anatomical abnormalities. We wanted to emphasize that application of different radiological diagnostic procedures could be very useful in establishing the proper diagnosis, as well as ruling out the existence of abscess collections and intraluminal collections in the dilated common bile duct. The abdominal CT revealed the presence of duodenal diverticulum, which was later-on confirmed by esophagogastroduodenoscopy. Care must be taken to diagnose the condition correctly by using appropriate radiological and endoscopic diagnostic procedures.

Conclusion

Anatomic abnormalities, such as duodenal diverticula, may represent a rare but important etiological factor of pancreatitis. We concluded that in our patients the duodenal diverticulum might have been a major contributing factor in repeated attacks of mild self-resolving pancreatitis.

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