

Isolated periampullary duodenal diverticulum causing massive upper gastrointestinal bleeding

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Keywords: Periampullary duodenal diverticulum, upper gastrointestinal bleeding, upper gastrointestinal bleeding case report, case report diverticular bleeding

Introduction

Diverticulum is an abnormal sac like protrusion of the bowel wall which is commonly reported in the large intestines. Other rare sites in the gastrointestinal (GI) system include stomach and the small bowel. Majority of the duodenal diverticulae are asymptomatic and detection may be incidental or due to an associated complication

Case presentation

A 68-year-old Sri Lankan male patient with a past history of chronic obstructive pulmonary disease presented with melaena and haematemesis. On admission, his haemodynamic parameters were compatible with a Class III haemorrhagic shock. His abdomen was soft without any evidence of peritonitis. Initial haemoglobin level was 4.5g/l and his other basic biochemical investigations were within the normal range. After the initial resuscitation with fluids and blood, he underwent an upper GI endoscopy which had limited visualization. Following spontaneous resolution of bleeding, his repeat upper GI endoscopy revealed an isolated diverticulum of the second part of the duodenum, 1 cm distal to the ampulla, with the size of the opening comparable to the luminal diameter (Figure 1). There was altered blood in the diverticulum suggestive of previous bleeding. Rest of the endoscopy was normal. Contrast enhanced CT scan showed an isolated duodenal diverticulum towards the pancreatic head without any evidence of compression of adjacent structures (Figure 2). Patient refused the surgical option for the management of the condition. At one year follow up, he was asymptomatic and the upper GI endoscopy did not reveal any progression of the lesion.

Discussion

The occurrence of small intestinal diverticulae is rare and

majority of those are located in the jejunal area followed by ileal region. The prevalence of duodenal diverticulae are reported as 2-5 percent with upper GI contrast studies and 7 percent during endoscopic retrograde cholangiopancreatography (ERCP). Majority are in relation to the ampulla and are often multiple. Patients who have small intestinal diverticulae have coexistent colonic diverticulae up to 60% and about 95% of duodenal diverticulae are related to pancreatic aspect of the duodenum. The true prevalence of this type of isolated large duodenal diverticulae is unknown.


Diverticulae are classified as true diverticulae and pseudo or false diverticulae. A true diverticulum is the out pouching of all layers of intestinal wall including mucosa and sub mucosa while pseudo diverticulae or false diverticulae involve the inner layers only. Pseudo diverticulae are usually acquired, often multiple and are classified as traction or pulsion type based on the pathogenesis. Diverticulae may occur due to congenital or acquired causes. Small multiple pseudo diverticulae are usually found at the site of blood vessels entering in to the duodenal wall probably because of adjacent wall weakening. Similarly in peri-ampullary cases, it is described to occur due to weakening of the wall due to the pancreatic duct opening as in our patient.

Majority of these diverticulae are asymptomatic and detection may be due to incidental finding in endoscopic or contrast studies or due to complications like malabsorption, perforation, bleeding and rarely intestinal obstruction. Some patients with juxta ampullary diverticulae like in our patient, may present with features of extra hepatic biliary diseases like ductal stones, obstructive jaundice, cholangitis and pancreatitis. Peri-ampullary diverticulae are frequently missed during forward viewing endoscopy as in our patient. In this context, the use of side viewing endoscopy is advisable for detection of peri-ampullary duodenal diverticulae. Earlier, upper GI contrast studies were used to detect similar diverticulae but the advances in imaging techniques with computerized tomography scan have replaced the use of endo-luminal contrast studies.

The incidence of duodenal diverticular bleeding is around 7 percent. The exact pathophysiological mechanism of

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Received: 26-01-2021 Accepted: 01-03-2024

DOI: <http://doi.org/10.4038/sljs.v42i01.8797>



duodenal diverticular bleeding is not clear. Presence of ectopic gastric mucosa, angiodysplasia, erosion of large vessels and neoplasia are few suggested causes. Bleeding usually occurs around the dome of the diverticulum near thinned out mucosa. The degree of bleeding may range from occult chronic anemia to massive hematochezia which may even cause abdominal compartment syndrome due to distended bowel loops with blood.

Management of duodenal diverticular bleeding includes endoscopic treatment, endovascular embolization and open surgical methods. Due to the higher incidence of re-bleeding up to 23% [3], endoscopic methods are not useful as a definitive treatment option. The use of endoscopic clipping, cyanoacrylate glue, and epinephrine or fibrin glue injection can be utilized as rescue or bridging treatment until definitive surgical management. Endovascular option involves identification of a definite bleeding point and embolization and therefore, requires facilities and expertise for the procedure.

Because of the low incidence, optimal surgical technique, recommendations and guidelines are not available for surgical management of duodenal diverticulae. Depending on the size and associated complications, surgery may range from diverticulectomy to a pancreatico-duodenectomy. Diverticulectomy remains the mainstay of surgical treatment in most of the patients at risk and who are not amenable for other options but has a reported post-operative leak rate of 30

to 50 percent. Close proximity of the diverticulum to the peri-ampullary region near the common bile duct and pancreatic ducts may indicate the need of pancreatico-duodenectomy. Diverticulae located in 3rd and 4th parts of the duodenum may be managed with segmental resection. Diverticulae causing extra hepatic biliary obstruction can be managed with duodenal exclusion by Roux-Y choledochojejunostomy and duodeno-jejunostomy

Conclusion

We discussed a rare occurrence of a peri-ampullary duodenal diverticulum that presented with massive GI bleeding. Interestingly, the bleeding settled spontaneously and there was no specific bleeding point or lesion noted. Therefore, although our patient was fit for surgery, patient opted for conservative management because of the high risk of surgical morbidity due to possible damage to the common bile duct. We recommend close follow up in patients who are subjected to conservative management with surveillance endoscopies.

References

1. Leivonen, M., J. Halttunen, and E. Kivilaakso, Duodenal diverticulum at endoscopic retrograde cholangiopancreatography, analysis of 123 patients. *Hepato-gastroenterology*, 1996. 43(10): p. 961-966.
2. Hamada, N., et al., Multiple duodeno-jejunal diverticula causing massive intestinal bleeding. *Journal of gastroenterology*, 2000. 35(2): p. 159-162.

Figure 1

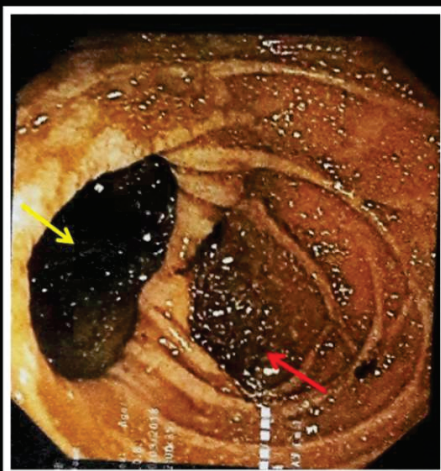


Figure 1. Endoscopic view of second part of the duodenum. Yellow arrow shows the diverticulum with altered blood within. Red arrow shows lumen towards the third part of the duodenum

Figure 2

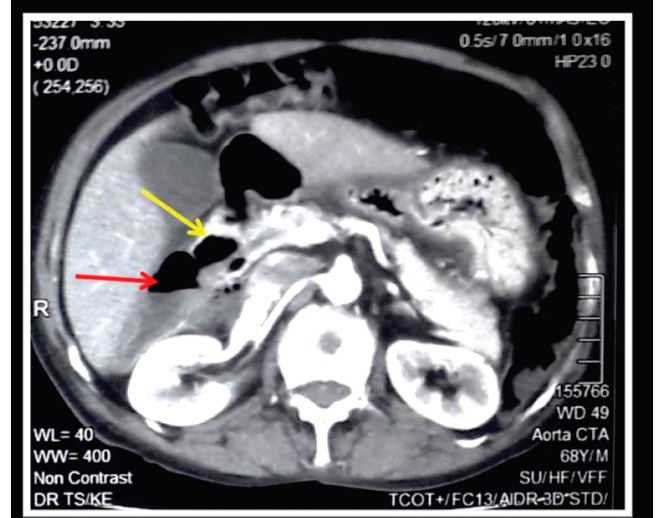


Figure 2. Contrast enhanced computed tomography scan image. Yellow arrow shows the diverticulum towards the pancreatic head region. Red arrow shows the second part of duodenum.

3. Afridi, S.A., C.J. Fichtenbaum, and H. Taubin, Review of duodenal diverticula. *American Journal of Gastroenterology*, 1991. 86(8).
4. Nishiyama, N., et al., Active bleeding from a periampullary duodenal diverticulum that was difficult to diagnose but successfully treated using hemostatic forceps: a case report. *Journal of medical case reports*, 2012. 6(1): p. 367.
5. Imai, S., et al., Superselective embolization for bleeding from duodenal diverticulum: a case report. *Radiation medicine*, 2000. 18(6): p. 377-379.
6. Vassilakis, J.S., et al., Roux-Y choledochojejunostomy and duodenojejunostomy for the complicated duodenal diverticulum. *The American journal of surgery*, 1997. 174(1): p. 45-48.

Learning Points:

- Peri-ampullary duodenal diverticulum is an uncommon source of upper GI bleeding
- Consideration of utilizing of side viewing endoscopy or second look endoscopy in instances where obvious cause is not found.
- Management of the diverticulum depends on the complications associated with the diverticulum and risks vs. benefits of the surgical management options.