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Abstract

Active mid-GI bleeding is a diagnostic and therapeutic challenge. In this case, urgent small-bowel capsule endoscopy and computed tomography (CT) angiography provided the diagnosis of jejunal diverticulum with active bleeding. At consecutive push enteroscopy, a blood vessel within a jejunal diverticulum was found and clipped. This article is part of an expert video encyclopedia.

Keywords

Capsule endoscopy; Clipping; CT angiography; Emergency capsule endoscopy; Mid-GI bleeding; Push enteroscopy; Standard endoscopy; Small-bowel diverticula; Video.

Video Related to this Article

Video available to view or download at doi:10.1016/S2212-0971(13)70106-7

Techniques

- Video capsule endoscopy.
- Push enteroscopy.
- CT angiography.
- Esophagastroduodenoscopy.
- Ileocolonoscopy.

Materials

- Endoscopes:
  - Video capsule endoscope.
  - PillCam SB2 and DR3 recorder with integrated real-time viewer; Given Imaging, Yoqneam, Israel.
  - Olympus PCF-Q 180; Olympus, Tokyo, Japan.

Background and Endoscopic Findings

Small-bowel diverticula are most frequently located in the duodenum, followed by Meckel’s diverticulum. Diverticula of the jejunum and ileum are less frequent. The majority of patients with small bowel diverticulosis are asymptomatic. Possible complications are abdominal pain, massive bleeding, perforation, obstruction, and bacterial overgrowth. In symptomatic patients, surgical resection of the affected small-bowel segment is the common treatment.

Capsule endoscopy can localize a segment of active bleeding as in jejunal diverticulosis. Diverticula may be difficult to detect, as the entrance may be small and possibly missed due to lack of air insufflation. Careful observation of the small bowel mucosa for irregularities such as diverted, elevated, and radiating folds is crucial.

Tips and Tricks

- Active bleeding during capsule endoscopy may mask the source of bleeding. However, careful scrolling through single images may be helpful in making a diagnosis.
- Use of a real-time viewer may demonstrate active bleeding and can accelerate diagnostic and therapeutic pathways.

Key Learning Points

- Small-bowel diverticula are most frequently located in the duodenum or represent singular Meckel’s diverticulum.
- Jejunal diverticulosis is a rare condition, usually remaining asymptomatic.
- Bleeding is a major complication of jejunal diverticulosis.
- Emergency capsule endoscopy and CT angiography can direct consecutive endoscopic or surgical therapy in mid-GI bleeding.

Complications and Risk Factors

The theoretical risk of capsule retention in a small-bowel diverticulum does not seem to play an important role in clinical practice.

Applying clips to the thin wall of a jejunal diverticulum could cause perforation.
Alternatives

CT angiography is a convenient method to detect and localize active bleeding from jejunal diverticula. However, it has to be applied immediately after the beginning or aggravation of bleeding or signs of hemodynamic instability. Selective mesentericography is an alternative in patients with ongoing bleeding with the option of vascular obliteration by intra-arterial application of coils. Enteroclysis or CT enterography can document size, localization, and extent of small-bowel diverticulosis. Double-balloon enteroscopy may demonstrate jejunal diverticula, missed at capsule endoscopy, probably due to lack of luminal distension and rapid passage of the capsule.

Scripted Voiceover

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<thead>
<tr>
<th>Time (min:sec)</th>
<th>Voiceover text</th>
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<tbody>
<tr>
<td>00:00</td>
<td>An 84-year-old male patient was admitted with rectal bleeding. Hemoglobin was 11 g dl⁻¹. Gastroscopy showed minute pre-pyloric erosions and erosions in the duodenal bulb.</td>
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<td>00:13</td>
<td>The remaining duodenum was normal.</td>
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<td>00:16</td>
<td>During colonoscopy multiple diverticula were seen, additionally fresh blood and coagula.</td>
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<td>00:25</td>
<td>After intubation of the terminal ileum fresh blood was visible and a small diverticulum.</td>
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<td>00:31</td>
<td>Capsule endoscopy was performed immediately after colonoscopy in search of the origin of mid-gastrointestinal bleeding. Real time viewer showed active bleeding presumably in the upper small bowel. Consecutively, data were downloaded and analysed immediately after visualization of the colon.</td>
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<td>00:56</td>
<td>Capsule tracing software on the left side of the monitor was helpful to localize the first small blood clot to the first jejunal loop.</td>
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<td>01:14</td>
<td>Close to the second jejunal loop, active bleeding was seen.</td>
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<td>01:29</td>
<td>In this situation, blood filling the lumen often masquerades as the source of bleeding. However, when carefully scrolling single images forward and backward, two diverticula could be detected. Although in this case entrance of the diverticula is small, radiating folds guide the diagnosis.</td>
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<td>01:49</td>
<td>During capsule endoscopy the patient passed larger amounts of blood and required resuscitation with crystalloids and packed red blood cells. Emergency CT angiography showed active bleeding with intraluminal contrast exudation close to an air filled diverticulum. Like capsule findings, CT localization was proximal jejunum.</td>
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<td>02:06</td>
<td>Hence, push enteroscopy was preferred over readily available balloon enteroscopy.</td>
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<td>With a variable stiffness pediatric colonoscope fresh blood in the proximal jejunum was confirmed, now without active bleeding.</td>
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<td>After cleansing the lumen from blood, jejunal diverticula could be observed.</td>
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<td>02:31</td>
<td>Inside one of the diverticula a vessel was detected which had not been visible for capsule endoscopy.</td>
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<td>... and finally three metal clips were placed at the base of the vessel without reactivation of bleeding. Clips were still present at interval surgical resection.</td>
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References