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CLINICAL CASE

Pitfalls in diagnosing small bowel carcinoid tumors

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Summary

Small bowel carcinoid usually presents with clinical symptoms and signs deriving from its endocrinological function and it rarely bleeds profusely. Below we present a case of a patient with intestinal bleeding. The bleeding tumor was finally diagnosed with the aid of wireless capsule endosopy (CE) and histological examination showed a small bowel carcinoid.

Key words: capsule endoscopy, carcinoid tumor, gastrointestinal endoscopy, gastrointestinal hemorrhage

Introduction

Small bowel tumors are rare, they encompass less than 5% of gastrointestinal (GI) tract tumors and account for 5-10% of all cases of GI bleeding [1,2].

Leiomyomas and leiomyosarcomas are the commonest small bowel tumors with the greatest bleeding tendency. A more chronic pattern of blood loss is usually found in carcinoid, adenocarcinoma, adenoma and lymphoma. In surgical series small bowel carcinoids represent one third of small bowel tumors [3].

Although autopsy studies show a relatively high carcinoid incidence of 5-10 per 100,000, the clinical incidence of midgut carcinoid is fairly low, about 0.5-1.5 per 100.000 [4,5]. Carcinoid tumors of the small intestine are most often located in the ileum, are multicentric and on diagnosis most of them have already spread to form lymph node or liver metastases [5]. Five to seven percent present with carcinoid syndrome and only occasionaly the patient presents with intestinal bleeding [6]. The carcinoid heart disease occurs late in the course of metastatic carcinoid disease in 20-70% of all patients [7].

In patients with obscure or manifest GI bleeding the best part of the small bowel cannot be reached by means of esophagogastroduodenoscopy (EGDS), push enteroscopy (PE) and coloileoscopy (CIS). Major limitations for this are the remoteness of the small intestine from GI tract openings and its length. Other conventional diagnostic procedures in small bowel bleeding are blood pool scintigraphy, angiography and barium small bowel series. Virtual endoscopy, employed lately, is an interesting alternative to conventional diagnostic techniques [8]. In recent years a novel endoscopic tool, CE, has been developed [9]. The method allows to endoscopically explore the small intestine in its entirety using a system composed by a peristalsis-propelled video capsule with a radio transmitter, a sensor array attached to the patient's abdominal wall and a data recorder worn at the patient's belt. The capsule collects and transmits images in real time to the sensor array and the data recorder. The videoendoscopic data can then be retrieved and analyzed using a workstation.

In this paper we present a case of a man with manifest GI bleeding, the cause of which was a carcinoid of the small intestine identified on CE.

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Case presentation

A 58-year-old man with melena lasting for 3 days prior to admission was referred to our hospital. He reported having similar problems 5 years ago when a peptic ulcer was found gastroscopically. On admission the patient was complaining of minor fatigue during the past few days. He had been on antihypertensive and statin therapy for several years. He was otherwise in good health.

The only abnormal laboratory finding was normocytic anaemia (erythrocyte count 3.75 10^9/L, Hb 11.4 g/dL, MCV 89.5 fL). During the first day of hospitalization, a decrease in Hb value of 1.5 g/dL was observed. Because of ongoing bleeding, the patient received 5 units of packed erythrocytes (derived from 2500 mL of blood) over 7 days. EGDS showed no abnormal findings. On CIS, 2 polyps in the sigmoid without any sign of recent haemorrhage were found, and frank melena was seen to be flowing from the ileum into the caecum.

Blood pool scintigraphy showed some active bleeding in a region projecting into the right upper abdominal quadrant, most probably a part of the small bowel. On angiography of the superior mesenteric artery and celiac trunk no extravasation was found in their course.

We then performed CE with an M2A plus capsule and read the findings with RAPID™ software (both Given Imaging Inc., Yoqneam, Israel).

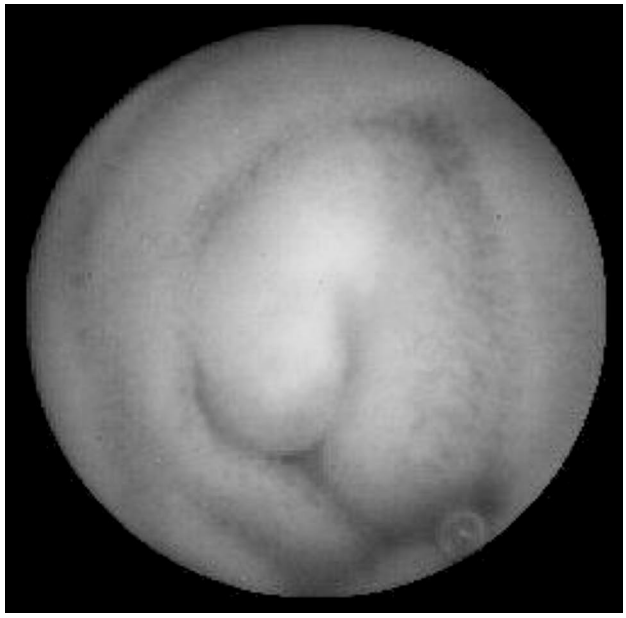

Figure 1. Capsule endoscopy view of the tumor.

Besides few small angiodysplasia-like mucosal changes in the proximal jejunal region, no pathology was found proximally. Following 3.5 h of small bowel transit time we visualized a bleeding site, which we concluded could be an angiodysplasia. In the immediate vicinity was a rounded umbilicated formation with a flat red spot, about 7mm in diameter, projecting in the right lower quadrant of the abdomen. Distally, the visibility was impaired owing to blood-tinged bowel contents. We concluded these lesions were the cause of bleeding and proceed to surgery.

On exploratory median laparotomy, a small umbilication of jejunal serosa lying 50 cm distally to the ligament of Treitz was found. At this site a 10 mm fixed tumor was palpable. Distally from it the lumen was filled with blood, which was even more evident on transillumination. A jejunal segmental resection of 5 cm, followed by a one-layer end-to-end anastomosis, was performed. The surgeon found no pathology on palpating the liver.

The patient experienced no difficulties or rebleeding afterwards, required no further blood transfusions and was discharged on the 6th postoperative day.

On histological examination the resected formation was found to be a well differentiated malignant (more than 10 mm in diameter) carcinoid of the small intestine, initial stage T2. The tumor cells expressed serotonin and, some of them, somatostatin as well.

No additional therapy was warranted, only follow-up was recommended.

Discussion

Because of the proximity of the bleeding lesion to the ligament of Treitz (50 cm) in our patient's case, PE would have probably led to the diagnosis without need to perform CE.

PE has a diagnostic yield ranging between 13 and 38%; in a randomized trial its sensitivity was 37% compared to 64% for CE [10,11]. In regard to its lower diagnostic yield and the possibility of performing wireless CE, we didn't perform barium small bowel series. Besides involving patient radiation, barium small bowel series in different studies were shown to be less diagnostic than CE (27% vs. 45% of the cases) [12,13].

Exploratory surgery unaccompanied by additional techniques has a yield of approximately 10% [14]. Recognition of vascular lesions cannot be achieved without the aid of transillumination or intraoperative endoscopy. The latter is invasive and associated with a number of complications, i.e. postoperative paralytic ileus and perforation. We refrained from performing

exploratory surgery with intraoperative endoscopy, as the bleeding wasn't hemodynamically or otherwise threatening the patient in the immediate time, not advocating for such an invasive tecnique.

Other morphologic and functional techniques, such as angiography of the superior mesenteric artery and blood pool scintigraphy with marked erythrocytes promised to bring some insight into the diagnostic problem.

Blood pool scintigraphy gives a positive result with at least 5 mL of intraluminal blood. It may confirm small intestinal bleeding, it confers no information about the nature of the bleeding lesion, while accurate localization is impossible. With sequential scans it allows detection of intermittent bleeding. Angiography of mesenteric arteries can demonstrate active bleeding and well vascularized nonbleeding lesions. Its diagnostic yield is 50-70%, but falls to 25-50% when the bleeding slows or stops; a positive find can only be gained with bleeding rates exceeding 0.5 or 1 mL/min [15]. Following angiography and blood pool scintigraphy we performed CE and visualized a bleeding site just before the tumorous formation and concluded it could be an angiodysplasia. When surgery was performed, besides the tumor, no angiodysplastic lesion was found. During CE we probably wrongly interpreted blood in the lumen as deriving from a "lesion" of the intestinal mucosa, which, revising the CE images, we concluded could well be an adherent coagulum or just superimposed blood. As we know of, our diagnostic mistake had no repercussions on the patients' well being.

Considering that this patient's small intestinal carcinoid was, besides bleeding occasionally, silent, and that carcinoid tumors only rarely present with bleeding as a sole sign, we couldn't have, within reason, thought of carcinoid as one of the primary differential diagnoses in this patient. However, if suspicion raised directing our attention to neuroendocrine tumors, we would have almost certainly discovered the tumor at times comparable to the actual time to diagnosis but at significantly reduced costs. Plasma Chromogranin A level detects functioning as well as nonfunctioning neuroendocrine tumors with a sensitivity of 68% and specificity of 86%, and its levels are correlated with tumor burden [16]. A higher specificity, but lower sensitivity (100% and 35%, respectively) is brought by 24h urinary 5-HIAA analysis, which detects serotonin-producing neuroendocrine tumors. The radiolabelled – somatostatin analogue scintigraphy (octreotide scan) has a high sensitivity (80-90%) and is also predictive of response to octreotide therapy [17]. The combined high specificity and sensitivity of these carcinoid-oriented diagnostic techniques exceeds those of CE. Nonetheless, in our patient's case therapy would have remained the same even if we had taken that diagnostic pathway.

Conclusion

It has been demonstrated that CE has many advantages over conventional procedures in diagnosing occult, active or chronic less intensive bleeding origins in the small intestine [18]. We believe CE does have some potential in diagnosing carcinoids of the small intestine, perhaps in those patients with vague abdominal symptoms where conventional carcinoid diagnostic workup results in negative or borderline findings.

Certainly, more experience will be needed in this field, but there are indications that CE is an important diagnostic tool, deserving consideration in the early phases of diagnosing small bowel carcinoids, especially in less intensive or occult bleeding.

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