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Diagnosis of small bowel radiation enteritis by capsule endoscopy

利用膠囊內窺鏡診斷小腸放射性腸炎

We report a case of radiation-induced enteritis of the small bowel diagnosed by capsule endoscopy. A 67-year-old woman, who had received radiotherapy for a carcinoma of cervix 10 years ago, presented with passage of tarry stool and anaemia. The gastroscopy results were normal and the small bowel enema showed no abnormalities, but colonoscopy revealed altered blood clots in the right-sided colon and in the terminal ileum. M2A capsule endoscopy was subsequently performed that showed an ulcer and stricture at the distal ileum. The capsule, however, became lodged at this stricture site caused by the stenosis. A small bowel resection was performed to remove both the diseased section and the capsule, and the patient made an uneventful recovery.

本文所報告的病例是以膠囊內窺鏡診斷放射治療所引發的小腸炎。病者67歲，女性，10年前曾接受子宮頸癌放射治療，入院前出現柏油便和貧血的症狀。胃鏡檢查結果正常，小腸灌腸後亦無異象，但結腸鏡檢查則顯示在右側結腸及迴腸終段有變異血塊，因此利用M2A膠囊內窺鏡進一步診斷，發現迴腸末端潰瘍並且變窄，而膠囊亦卡在此狹窄處。病者接受小腸切除術，把有問題的小腸部分和膠囊一併切除後順利康復。

Introduction

Patients presenting with obscure gastro-intestinal bleeding often pose a challenge to both gastro-enterologists and gastro-intestinal surgeons.[1] The introduction of the wireless capsule endoscopy in the year 2000 has made possible the minimally invasive visualisation of the entire small bowel.[2] Early trials suggested that capsule endoscopy was well tolerated by most patients and produced a higher diagnostic yield compared with the push small bowel enteroscopy and with the barium small bowel studies.[3,4] The impaction of the capsule at strictures and diverticulae is a potential complication of the use of capsule endoscopy.[5] This report describes a case of obscure gastro-intestinal bleeding caused by small bowel radiation enteritis. Capsule endoscopy correctly identified the bleeding ulcer at distal ileum; however, the stricture at the same site caused the retention of the endoscopic capsule, which was subsequently removed at the laparotomy.

Case report

A 67-year-old woman who had passed tarry stools for 5 days was admitted in early February 2004 to the St Teresa's Hospital, Hong Kong. She had a history of cervical carcinoma and had received primary radiotherapy more than 10 years ago. The haemoglobin level at admission was only 80 g/L (reference range, 115-160 g/L). The results of gastroscopy were normal but the total colonoscopy revealed some altered blood and melena on the right-sided colon and at the terminal ileum. This bleeding site, however, was not identified. She was then referred for a small bowel enema which was reported to be normal and no specific site of stenosis was noted in the small bowel series. Subsequently, she was referred to the Hong Kong Sanatorium and Hospital, Hong Kong for a M2A capsule endoscopy (Given Imaging Ltd, Yogneam, Israel). The results showed an ulcer and a stricture at the distal ileum (Fig 1). The capsule, however, failed to pass beyond the stricture caused by an undiagnosed stenosis. The patient did not report any symptoms related to the either capsule retention or signs of the intestinal obstruction.

Key words:
Capsules;
Endoscopy, gastrointestinal

關鍵詞：
膠囊；
內窺鏡術，胃腸的

Hong Kong Med J 2004;10:419-21

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Fig 1. Capsule endoscopic view of an ulcer in the distal ileum

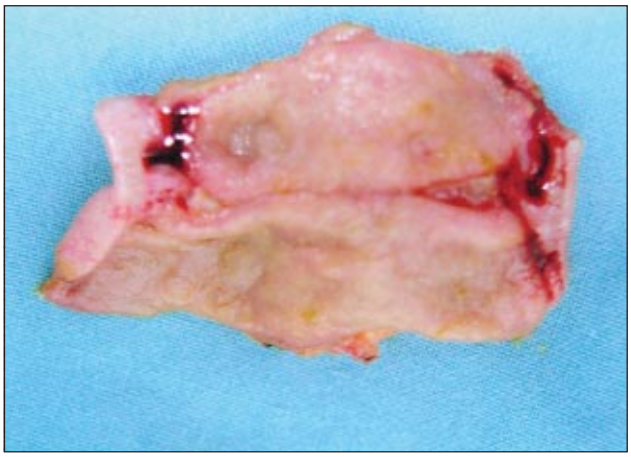

Fig 2. Resected small bowel showing an ulcer and a stricture (cut open)

A laparotomy was performed 2 days after the capsule endoscopy investigation because of the failure to retrieve the capsule and the observed bleeding pathology. Furthermore, the capsule was found to be lodged at a tight stricture at about the 30-cm level, proximal to the ileo-cecal valve. An enterostomy was performed, which showed a bleeding ulcer at this stricture site. An intra-operative retrograde small bowel enteroscopy using a colonoscope was then performed, which confirmed no other sources of bleeding. The capsule was then removed and a segment of the diseased small bowel was resected with primary end-to-end anastomosis (Fig 2). Also, a short segment stricture at about the 20-cm level proximal to ileo-cecal valve and a stricturoplasty were performed. The postoperative treatment course went smoothly, and the patient was discharged home after 1 week. The pathology confirmed small bowel radiation enteritis with an ulcer and a stricture. The patient has not reported any episodes of bleeding since the operation.

Discussion

Investigation of the small bowel pathology plays an important role in the evaluation of patients presented with obscure gastro-intestinal bleeding.[1] Small bowel barium enema was the conventional method for the investigation of luminal pathology. This technique, however, has limited sensitivity, especially when the source of bleeding is from a flat lesion like angiodysplasia. Moreover, patients have to be exposed to certain amount of radiation. Another method is push enteroscopy, which provided direct visualisation of small bowel, but was limited by the patients' tolerability.[6] With most cases of push enteroscopy, endoscopists failed to visualise the entire small bowel. Furthermore, intra-operative enteroscopy requires that laparotomy to be performed, and hence, was reserved as the last resort.

The introduction of wireless capsule endoscopy has allowed the visualisation of the entire small bowel in a minimally invasive fashion. Recently, the use of capsule endoscopy has been extended to the evaluation of other small bowel pathologies, such as Crohn's disease and celiac disease.[7,8] In a recent study of 100 cases of obscure gastro-intestinal bleeding reported by Pennazio et al,[9] capsule endoscopy was found to have a sensitivity and specificity of 88.9% and 95.0%, respectively. It is possible that capsule endoscopy can reduce the time of diagnosis, hence, lead to earlier definitive treatments.

The pre-examination preparation typically includes a bowel cleansing preparation the night before and fasting overnight. Some investigators also advised the use of medicines to promote gastric emptying prior to the procedure.[10] The endoscopic capsule is swallowed and the patient can assume normal daily activity during the 8-hour examination period. The M2A capsule endoscopy (length, 26 mm; diameter, 11 mm; 3.7 g) obtains and transmits images to a recording device attached to the patient's waist. After completion of the examination, the recorder is returned for data analysis. The data are downloaded to a computer with software that can convert the information to the video images used to simulate an endoscopic view. The video is reviewed by a physician or trained personnel—the total time for this evaluation is usually 2 hours. The major potential complication is the retention of the capsule at a stricture site, which may require surgical treatment for its retrieval.

In this case, all the conventional investigations failed to locate the exact source of bleeding. With the aid of capsule endoscopy, the pathology could be visualised and the site of bleeding was accurately localised. One drawback was that the capsule lodged at the stricture and had to be surgically removed. Nevertheless, the primary pathology was

adequately treated and the capsule retrieved during laparotomy. Recently, a new biodegradable M2A Patency Capsule (Given Imaging Ltd; similar in size to capsule endoscopy) was developed to test the functional patency of the bowel lumen prior to the standard capsule endoscopy.[11] Hopefully, with this new design we can avoid the problem of capsule retention in future cases.

In conclusion, this case demonstrated the superior sensitivity of capsule endoscopy compared with conventional methods for the investigation of obscure gastro-intestinal bleeding. Nevertheless, patients should be warned about the possibility of retention of the capsule caused by an unexpected stenosis. In such circumstances, surgical treatment may be required to remove the device.

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