Brief Communication
Communication abrégée

Endoscopic perforation of the rectum presenting initially as a change in voice

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Peritonitis secondary to gastrointestinal perforation is the most common form of severe, acute intraabdominal infection.[1,2] Perforation of the colon and rectum often occurs in elderly patients and is associated with a high death rate.[1] Retroperitoneal perforations generally have a better outcome than free intraperitoneal perforations. As with all surgical emergencies, early diagnosis and treatment can profoundly influence the ultimate outcome. Voice change occurring after an endoscopic procedure is a subtle clue, suggesting gastrointestinal perforation with interstitial tracking of gas. This finding should prompt an aggressive search for further evidence of gastrointestinal perforation.

Case report

A 77-year-old man required a subtotal colectomy with end ileostomy and Hartmann's procedure for medically intractable ulcerative colitis. Postoperatively, he enjoyed good health and underwent annual surveillance proctoscopy with biopsy. Sixteen years later, immediately after a routine surveillance flexible endoscopy with rectal stump biopsy, he complained of hoarseness. Physical examination 2 hours later revealed a soft, nontender abdomen, a chest clear to auscultation, and no swelling, tenderness or crepitus about the head or neck. He was released from hospital and returned home. Four hours later he returned to the hospital because of painless distortion of his facial features.

When re-examined there was soft-tissue distension and crepitus of the periorbital, buccal, cervical and thoracic tissues. He felt well, was afebrile and had normal vital signs. His voice was high pitched with a squeaking quality, quite different from his normal voice. The trachea was midline. There was no stridor, and the chest was clear with no wheezing or crepitations. The abdomen remained soft and nontender, with normal bowel sounds and ileostomy function. The hemoglobin level was 144 g/L and the total leukocyte count was 13.0×10^9/L. Serum creatinine, amylase, electrolytes and glucose levels were normal.

Plain radiographs of the neck and thoracoabdominal cavities revealed gross pneumoperitoneum, pneumoretroperitoneum, pneumomediastinum and subcutaneous emphysema in the abdominal wall, upper thighs and cervical tissues (Fig. 1). These findings were confirmed on CT of the abdomen and pelvis with oral and rectal contrast media. There was a suggestion of a mucosal defect in the rectal stump although there was no leakage of rectal contrast medium or evidence of pelvic collection.

The patient was managed conservatively with nasogastric intubation, intravenous antibiotics and close clinical monitoring. He remained well without evidence of intra-abdominal or systemic infection. The soft-tissue swelling gradually subsided, and when he was discharged home on the fifth hospital day his voice was normal.

Discussion

Perforation of the gastrointestinal tract is an uncommon but well-recognized complication of endoscopic procedures, having a reported incidence of between 0.15% and 3.0%.[3–5] Symptoms of endoscopic perforation of the colon or rectum are determined by the size, site, mechanism and degree of contamination of the perforation, as well as the level of sedation, underlying health and delay in the patient's presentation.[4,5] Colonic perforations have been separated into 2 groups, depending on whether the perforation occurs during a diagnostic or therapeutic endoscopy.[3,6] The highest risk of perforation occurs during therapeutic endeavours such as polypectomy or biopsy.[4] These injuries

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are more likely to be small localized ones that are often sealed by adhesion of pericolic fat, omentum or adjacent viscera.[3,5,6] In contrast, injuries occurring during diagnostic endoscopic procedures are often caused by manoeuvering of the instrument through tortuous or tethered bowel, resulting in large longitudinal tears of the antimesenteric wall.[5,6] Operative treatment is therefore recommended for management of a perforation that occurs after a difficult diagnostic procedure.[6]

Although the standard approach to non-iatrogenic colorectal perforations is immediate surgical intervention,[2] injuries occurring during therapeutic procedures can be selectively managed nonoperatively.[6,7] Operative exploration is required though, if signs of peritonitis or sepsis develop, if there is distal obstruction or if the colon has been poorly prepared.[4] Important factors in managing a patient nonoperatively include a delay in diagnosis, the presence of associated colonic disorders and the overall health of the patient.[5] Nonsurgical management should consist of intravenously administered antibiotics targeted against facultative gram-negative and anaerobic organisms, bowel rest, nasogastric decompression and frequent clinical assessment.[5]

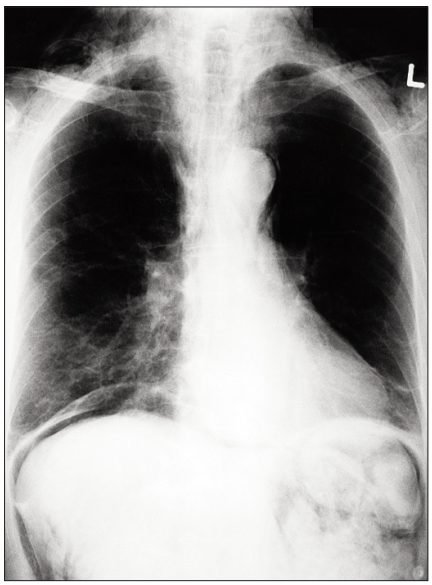

FIG. 1. Posteroanterior chest radiograph showing air between the diaphragm and liver, in the mediastinum, and in the soft tissues of both shoulders and both sides of neck.

Retroperitoneal perforations may be more clinically occult than free intraperitoneal perforations, and any aid to earlier diagnosis is thus important. Pneumoretroperitoneum may originate from the disruption of cutaneous or gastrointestinal mucosal barriers, infection with gas-forming organisms or rupture of the respiratory tract or alveoli,[8] although it usually reflects a breach in the integrity of some portion of the gastrointestinal tract. The volume of extravasated air correlates poorly with the clinical severity of the perforation.[5] Endoscopic perforations with pressurized insufflation will create more extensive gas more frequently than the more sinister but lower pressure causes of pneumoretroperitoneum, such as complicated duodenal ulcer, inflammatory bowel disease or diverticulitis.[8] Gas reaches the cervical planes by dissecting through the retroperitoneal, mediastinal and cervical tissue planes.[4–6,8]

Post-endoscopic voice changes likely occur because of changes in the shape and length of the supralaryngeal vocal tract (nose, mouth, pharynx), secondary to mechanical embarrassment arising from parapharyngeal emphysema.[9,10] Kirk and associates[9] described 2 cases of colonic perforation, 1 occurring after colonoscopy, and the other after a barium enema, both of which resulted in retroperitoneal and intraperitoneal air, pneumomediastinum and extensive subcutaneous emphysema. Both patients exhibited a high-pitched voice that returned to normal with resolution of the subcutaneous emphysema.[9] Another case of change in voice representing the first sign of rectal perforation was reported by Rabin and colleagues.[10]

Conclusions

Nonoperative management of colorectal perforations during endoscopic procedures has become an accepted management option in selected patients. A crucial factor in the success of this approach is early diagnosis and treatment of the perforation. A change in voice after a colorectal procedure is a subtle clinical clue that should prompt investigation to determine whether a perforation has occurred.

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