

中文題目：大腸鏡黏膜切除術後併張力性氣胸之內科成功治療案例分享

英文題目：Tension pneumothorax, subcutaneous emphysema and pneumoperitoneum after endoscopic mucosal resection successfully treated conservatively

作者：林弘恩¹ 林毅軒^{1,2} 羅景全^{1,2} 陳炳憲^{1,3} 黃怡翔^{1,2} 侯明志^{1,2}

服務單位：台北榮民總醫院 內科部¹胃腸肝膽科²內視鏡中心³

Introduction

Endoscopic mucosal resection (EMR) has gained wider acceptance as a therapeutic option for superficial cancers involving the mucosa of gastrointestinal tract. Although iatrogenic perforations resulting in the presence of free air in soft tissue planes (subcutaneous emphysema, pneumomediastinum, pneumoretroperitoneum, pneumoperitoneum, pneumopericardium and pneumoscrotum) is recognized, rare cases of tension pneumothorax after EMR have been published. We reported a case of laterally spreading tumor at the site of descending colon after EMR with developing the spectrum of extraluminal air: tension pneumothorax, subcutaneous emphysema and pneumoperitoneum in a critical condition. The purpose of this report is to raise the awareness on the likelihood of these complications after EMR. We also make some strategies to avoid such conditions and further surgical interventions.

Case Presentation

A 58-year-old male underwent colonoscopy at local medical hospital which revealed a 3 cm lateral spreading tumor at descending colon while health examination. He came to Taipei Veterans General Hospital for an EMR. The colonoscopy was performed in the left lateral position with the patient sedated. The colonoscopy which was insufflated with air revealed a lateral spreading tumor – non granular type, 3 cm in diameter, located 40 cm from anal verge. (Fig, 1A).



Fig, 1A

After submucosal injection of 30ml of a mixture of 0.9 % saline, indigo carmine, and adrenaline (1:10 000), the tumor was resected for two pieces (Fig, 1B).



Fig, 1B

Deep wound at center of the tumor was noted after procedure and the wound was closed by 8 hemoclips. (Fig, 1C-D)



Fig, 1C



Fig, 1D

No complications were identified during the colonoscopy. He denied any other discomfort after the procedure. Few hours later, he suffered from sudden onset dyspnea, associated with cold sweating and upper abdominal pain which could be mildly relieved while leaning forward. Vital sign showed tachycardia and oxygen saturation on room air with 85%. Physical examination revealed respiratory distress with accessory muscle usage, engorgement of right jugular vein, decreased breath sound in left lung field, tenderness over upper abdominal area without muscle guarding and rebounding pain. Hypoxemia got mildly improved under supplemental 100% oxygen.

An emergency chest X-ray examination was performed which showed trachea deviated to right side and pneumothorax of the left lung (Fig. 2A).

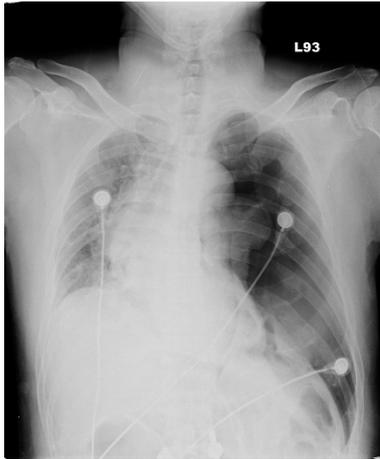
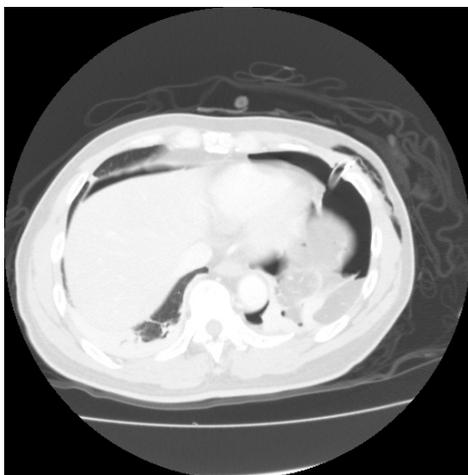
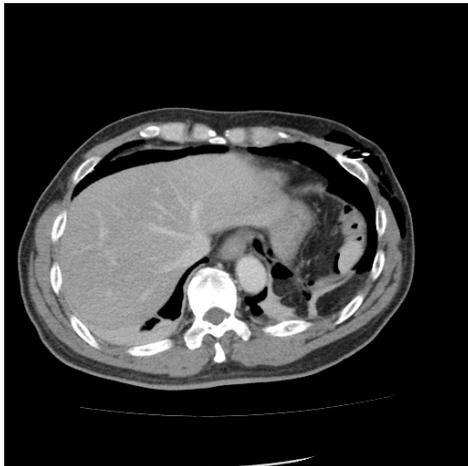
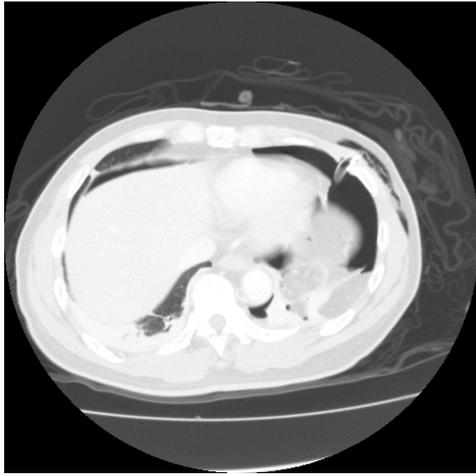


Fig. 2A

Laboratory data revealed that high white blood cell count 13,500 (normal range, 4,500-11,000 /CUMM), and that the C-reactive protein level was normal (normal range , 0-0.5 mg/dl). Intercostal chest tube for drainage of the left tension pneumothorax was performed immediately. A computerized axial tomography (CT) scan of the chest, abdomen, and pelvis with concurrent intravenous administration of contrast medium was performed. This showed left pneumothorax and subcutaneous emphysema at left chest wall status post chest tube insertion and pneumoperitoneum. (Fig. 2B-D)





Due to no peritoneal sign noted, the patient was managed conservatively with bowel rest, intravenous fluids, intravenous antibiotics and pain control. The patient made an uneventful recovery with resolution of pneumothorax, subcutaneous emphysema and pneumoperitoneum. The excised specimen was histologically diagnosed as tubular adenoma. He was discharged home on day 7 with arranged outpatient follow up.

Discussion

Bleeding and perforation are the major complications associated with EMR. The incidence of colonic perforation following endoscopic mucosal resection is about 0.3-0.5%. In addition to relatively high risk of colorectal perforation following therapeutic colonoscopy such as EMR, endoscopic submucosal dissection (ESD), and balloon dilation procedures, other risk factors included older age, co-morbidity, inflammatory colonic disease, use of hot biopsy forceps, endoscopist inexperience and the size and type of polyp, with large laterally spreading tumors. There are different mechanisms whereby extraluminal air may reach the different body compartments which include undue instrument manipulation, air insufflation or improper use of diathermy resulting in overt colonic perforation. Air may then pass into the abdomen or thorax by a number of routes. In our case, retroperitoneal air may result from direct retroperitoneal descending colonic perforation and the air may travel along the fascial planes to enter the mediastinum. Subsequent rupture of the mediastinal pleura allows air to decompress into the pleural cavity and cause tension pneumothorax. The best strategy to avoid such condition was to minimize the risk of perforation. First, the endoscopist should review the planned procedure with the team (nurse and technician) and all necessary equipment is available in the room before EMR. Second, because of faster absorption of carbon dioxide compared with air, routine use of carbon dioxide for the procedure would minimize the need for abdominal decompression if a perforation were to happen. Third, patient optimization should emphasize adequate bowel preparation prior to the procedure to minimize the egression of fecal material into the peritoneal cavity.

Once perforation really happened, first, immediate recognition of an endoscopic perforation is crucial to avoid further condition such as tension pneumothorax. Indigo carmine stains the submucosa blue and helps the endoscopist assess the depth of resection and recognized perforation easily. Second, patients with colorectal perforation mostly suffered from diffusely abdominal pain with peritoneal signs. Instead, our patient suffered from sudden onset respiratory distress without peritoneal signs in a critical condition which was presented few hours after EMR. So all endoscopists must be aware of the possible association between acute respiratory failure in the peri and post colonoscopy setting and tension pneumothorax which should be immediately decompressed and drained by the insertion of a large-bore angiocath or chest tube into the pleural cavity due to the possibility of a cardiopulmonary arrest with pulseless electrical activity if delayed management. Third, the choice of treatment for colonoscopy related perforation is controversial. In our case, the choice of non-surgical treatment with intravenous antibiotics use and fluid was based on the following : first, the patient's vital signs got more stabilized after immediately intercostal drainage by chest tube; second, the abdominal pain was localized without peritoneal signs; and third, the movement of air from the peritoneal space is usually considered as non-infectious.