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clinical practice

Right pneumothorax secondary to colonoscopic perforation: a case

D. CROCETTI[1], E. FIORI[1], U. COSTI[1], A. DE GORI[1], M. MICCINI[1], S. VALABREGA[2], G. CAVALLARO[1], G. DE TOMA[1]

SUMMARY: **Right pneumothorax secondary to colonoscopic perforation: a case.**

D. CROCETTI, E. FIORI, U. COSTI, A. DE GORI, M. MICCINI, S. VALABREGA, G. CAVALLARO, G. DE TOMA

Aim. *The purpose of this study is to determine the anatomical aspects, mechanisms, risk factors and appropriate management of development of pneumothorax during a routine colonoscopy.*

Clinical case. *We report a case of an accidental bowel wall injury during diagnostic colonoscopic with consequent pneumoperitoneum; this was followed by expansion of gas through diaphragmatic fenestration perhaps congenital, in right pleural cavity causing pneumothorax.*

Discussion. *Rarely, colonic perforation during colonoscopy can occur into the extraperitoneal space, thus leading to the passage and diffusion of air along the fascial planes and large vessels, possibly causing pneumoretroperitoneum, pneumomediastinum, pneumopericardium, pneumothorax, and subcutaneous emphysema. The combination of intraperitoneal and extraperitoneal perforation has also been reported. Pneumothorax following a colonoscopy sigmoid perforation is an extremely rare but severe and often lifethreatening complication.*

Conclusion. *If the patient develops dyspnea and pneumoderma during or after this procedure, a chest radiogram or thoracoabdominal CT should be taken for diagnostic purposes. Urgent treatment, starting with chest tube insertion(s) and laparotomy or laparoscopy could be lifesaving.*

KEY WORDS: Colonoscopy - Pneumothorax - Colonic perforation.

Introduction

Colonoscopy is worldwide used for diagnosis and treatment of most colorectal diseases. As the number of colonoscopies has increased over the years, the frequency of complications has increased too (1, 2). Bowel perforation is the most common complication, often requiring urgent surgery. The incidence of perforation after diagnostic colonoscopy has been reported to be 0.03% to 0.65%, while it raises up to 0.07% - 2.1% after interventional manoeuvers (3, 4). Perforations of the colon usually causes pneumoperitoneum and subsequent peritonitis. Rarely, colonic perforation can occur into the extraperitoneal space, thus leading to the passage and diffusion of air along the fascial planes and large vessels, possibly causing pneumoretroperitoneum, pneumomediastinum, pneumopericardium, pneumothorax, and subcutaneous emphysema (3, 5). The combination of intraperitoneal and extraperitoneal perforation has also been reported.

Clinical case

A 52-year old woman underwent diagnostic colonoscopy for chronic anemia. During the procedure, an accidental sigmoid wall injury was created. So, urgent thoracic and abdominal computed tomography (CT) scan was performed due to acute abdominal pain and dyspnea, revealing pneumoperitoneum of the right abdomen, associated with right pneumothorax (Figure 1). Urgent laparotomy was then performed, and during exploration of the abdomen a 0.5-cm sigmoid perforation was identified and treated by direct suture. At the level of the right hemi-diaphragm we found a 3 cm diaphragmatic fenestration (Figure 2), so a direct suture was performed to close it and a right chest tube was inserted

[1] Department of Surgery "Pietro Valdoni", "Sapienza" University of Rome, Rome, Italy
[2] Department of "Scienze Medico-Chirurgiche e di Medicina Traslazionale", "Sapienza" University of Rome, Rome, Italy

Corresponding author: Daniele Crocetti, e-mail: danielecrocetti@hotmail.it

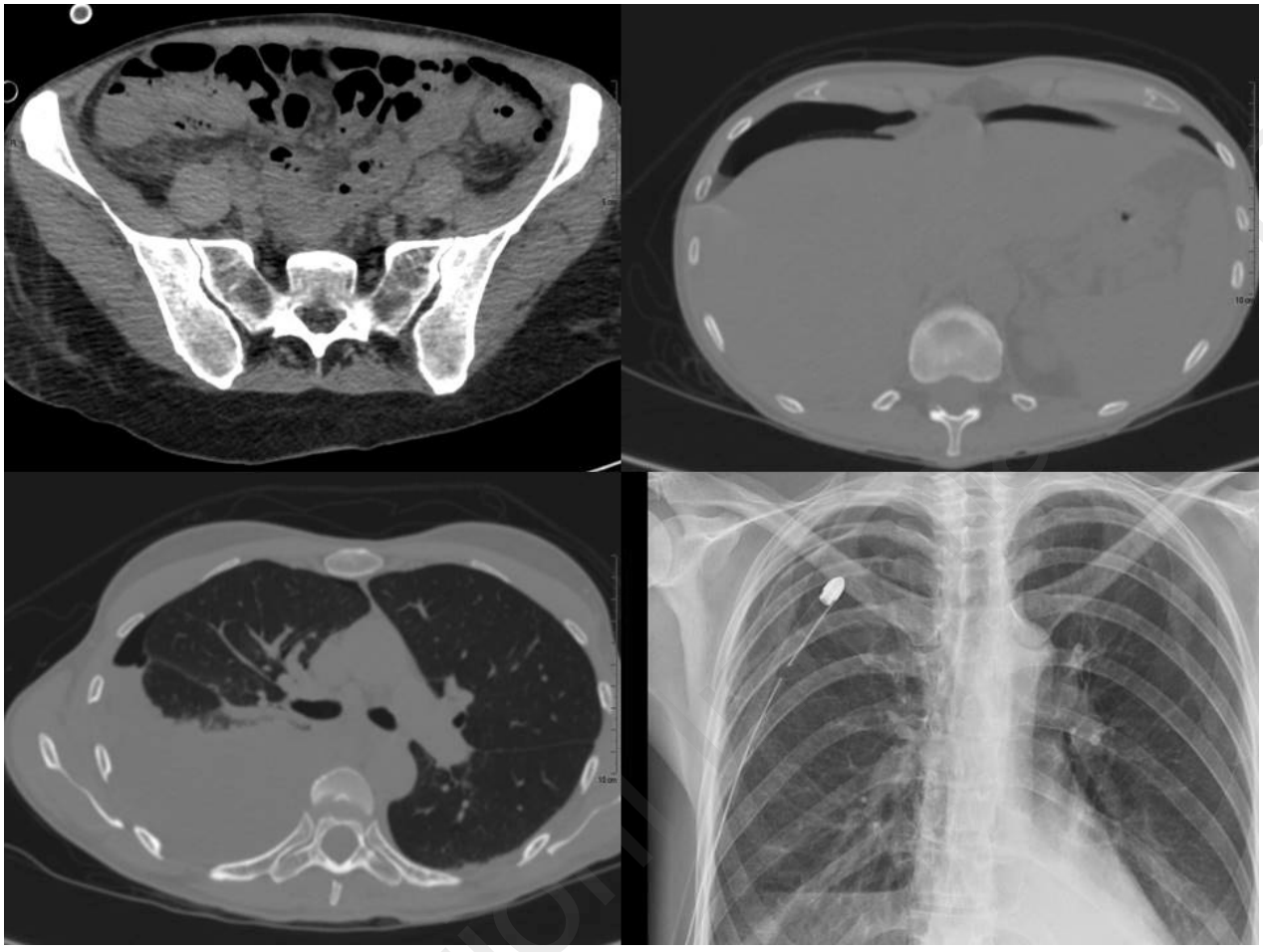

Figure 1 - Computed tomography showing pneumoperitoneum and right pneumothorax.

to solve the pneumothorax. The postoperative course was uneventful, and the patient was discharged on postoperative day 9. Patient gave informed consent the study.

Discussion

The most frequent complications of colonoscopy are bleeding and visceral perforation (6). Mechanisms resulting in colonic perforations may include direct mechanical trauma, thermal injury from electrocautery and pneumatic barotrauma from excessive air insufflation (7). In the majority of cases, the perforation occurs intraperitoneally, and only few cases reporting extraperitoneal colonic perforation with pneumothorax or extraperitoneal accumulation of air (7). This complication can, however, be explained considering the anatomic connection between the mediastinum and the retroperitoneum. The anatomical basis of this phenomenon can be explained by the continuity between the visceral space of neck, thorax and abdomen via a fascial compartment. Maunder et al. (8) described the route of extraperitoneal gas. The soft-tissue compartment of neck, thorax, and abdomen contains 4 regions: the subcutaneous tissue, prevertebral tissue, visceral space, and previsceral space. The visceral space goes from the neck through the mediastinum to the retroperitoneum, with communication between these areas. Pneumothorax can develop when rupture of the mediastinal parietal pleura occurs (9). In our patient the pathophysiology of pneumothorax was different: during colonoscopy an accidental bowel wall injury was created with consequent pneumoperitoneum; this was followed by expansion of gas through diaphragmatic fenestration in right pleural cavity perhaps congenital (Figure 2).

If the perforation occurs on the extraperitoneal

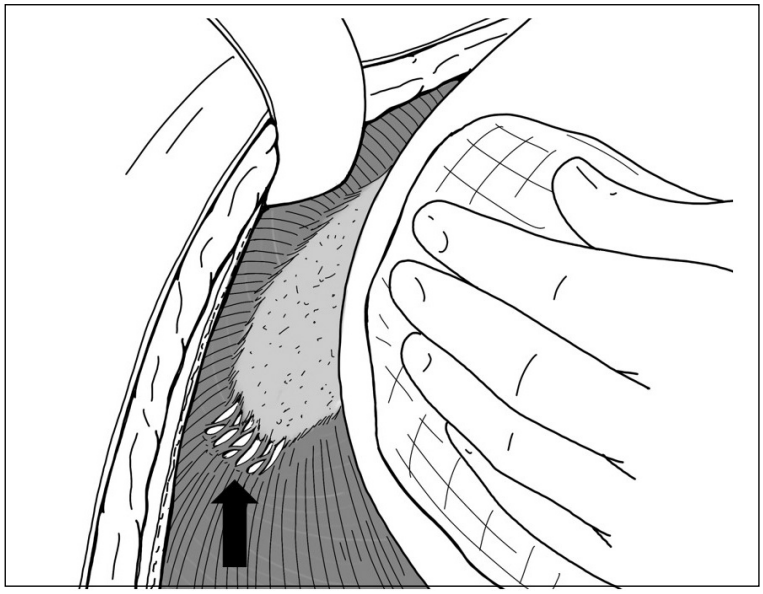

Figure 2 - Diaphragmatic fenestration (scheme).

aspect of the colon, symptoms may be unusual and confounding. When the retroperitoneal perforation is associated with pneumothorax, dyspnea is a common symptom (1).

The management of this complication is controversial. The controversy begins on the decision between operative and non-operative treatment. The decision on whether operative or non-operative treatment should be used will depend on the type of injury, the quality of bowel preparation, the underlying colonic pathology, the time of diagnosis relative to the time of perforation, and most important the clinical status of the patient (2). Conservative management, chest tube alone, surgical intervention or endoscopy procedure have been reported (1-3, 5-7, 10).

Conclusion

Pneumothorax and tension pneumothorax following a colonoscopy are extremely rare, about 30 cases published till now, but they are severe and often lifethreatening complication. If the patient develops dyspnea during or after this procedure, a chest radiogram or thoracoabdominal CT should be taken for diagnostic purposes. Urgent treatment, starting with chest tube insertion(s) and laparotomy or laparoscopy could be lifesaving.

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