

LETTER

Pleural effusion after laparoscopic appendectomy in a 9-year-old boy

Dear Editor,

Right pleural effusion, following laparoscopic appendectomy, represents an extremely rare complication¹.

A 9-year-old boy presented to the emergency department complaining of worsening abdominal pain, fever, and nausea. Physical and ultrasound examination revealed appendicitis with a perityphlitic abscess.

The patient underwent a laparoscopic appendectomy (intraabdominal pressure: 12 mmHg, duration of the operation: 110 mins). We secured the base of the appendix with the laparoscopic stapling-system (Endo GIA™ 30, Medtronic, Minneapolis, MN, USA), and performed peritoneal lavage with about one liter, as well as drainage of the perityphlitic abscess. A drainage was also placed, which was removed 24 hours later. A sensitive *E. coli* was isolated from the peritoneal fluid culture. The patient received postoperatively intravenous (iv) antimicrobial treatment with cefuroxime.

On the 7th postoperative day, he presented right lower thoracic pain and dyspnea. The x-ray views revealed right pleural effusion. Initially, he was treated conservatively, but after developing high fever (39.5 °C), a thoracic drainage was performed. The cultures from the drained material did not yield any microorganism. According to the Light's criteria, the fluid was exudate. The patient was monitored in the pediatric intensive care unit for two days. He had a satisfactory recovery and was discharged five days later.

There are reports, in both adults and children, about the appearance of pleural effusion after open abdominal surgery¹⁻³. It is mainly associated with the upper gastrointestinal system, while the possible causes are the manipulation and irritation of pancreas, pulmonary embolism, hypervolemia, subphrenic abscesses, atelectasis, the presence of free abdominal fluid and the irritation of the diaphragm^{1,2}.

Following a laparoscopic appendectomy, only three cases of right pleural effusion in adults have been reported, all regarding perforated appendicitis¹. Similar complications from the respiratory system have been described in other laparoscopic operations in children, especially due to the high intraabdominal pressure and the Trendelenburg position³.

The present case is the first report of such complication after laparoscopic appendectomy in a pediatric patient. Factors like the copious peritoneal lavage and insufficient drainage, as well as the placement in a Trendelenburg position during surgery, could have allowed the abdominal fluids to flow into the right hypochondrium, causing diaphragmatic irritation and secondary pleural effusion.

The absence of microorganisms cannot exclude the contamination of the pleural cavity by abdominal fluids since the patient was receiving iv antimicrobial treatment. Therefore, a congenital diaphragmatic communication could have also been the causative factor.

This report aims to raise the awareness regarding the risk of right pleural effusion. During the postoperative course of a laparoscopic appendectomy, this complication should not be forgotten. The administration of iv antimicrobial treatment could be sufficient for the treatment. Otherwise, percutaneous pleural puncture or thoracic drainage should be performed. In cases of recurrent pleural effusion, early thoracoscopy is recommended to avoid the appearance of encysted pleurisy. The proposal of intraoperative measures, such as the avoidance of an overly-pronounced Trendelenburg position, the limitation of peritoneal lavage volume, the drainage use and low pressure (≤ 12 cmH₂O) could prove beneficial in avoiding the appearance of right pleural effusion.

Keywords: Pleural effusion, laparoscopic appendectomy, perforated appendicitis

Conflict of interest

Authors declare no conflict of interest.

References

1. Peycru T, Jarry J, Brun S, Bodin R, Schwartz A, Gonzalez F. Right postoperative pleural effusion following laparoscopic appendectomies: a case series. *Ann R Coll Surg Engl.* 2010; 92: W33-W35.
2. Lin HF, Lai HS, Lai IR. Laparoscopic treatment of perforated appendicitis. *World J Gastroenterol.* 2014; 20: 14338-14347.
3. Linnaus ME, Ostlie DJ. Complications in common general pediatric surgery procedures. *Semin Pediatr Surg.* 2016; 25: 404-411.

Koutserimpas C¹, Angeli M², Ehlen M²

¹2nd Department of General Surgery, Sismanogleio General Hospital, Athens, Greece

²Department of Pediatrics, St. Elisabeth, Academic Hospital, Neuwied, Germany

Corresponding author: C.Koutserimpas, MD, General Surgery Department, "Sismanogleio" Hospital, Athens, Greece, 1 Sismanogliou str., 15126, tel: +306948712130, e-mail: chrisku91@hotmail.com