Pleural Effusions Complicating Upper Abdominal Surgical Pathologies in Children*

Çocuklarda Üst Abdominal Cerrahi Patolojilerin Komplikasyonu Olarak Gelişen Plevral Efüzyonlar*

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Abstract

Intractable pleural effusions can occur during the courses of serious intra-abdominal surgical pathologies. Information about the pathogenesis, presentation and management of this pulmonary complication is limited in the literature particularly for the childhood period. In this study we aimed to present our experience on management of three adolescent patients with pleural effusions which developed after upper abdominal surgical pathologies. According to the data collected from our patients, presence of peritoneal fluid, fever higher than 38°C and adolescent age can be risk factors for development of pleural effusions. If intractable fluid collections resist to multiple thoracentesis then tube thoracostomy may be needed for the treatment.

Keywords: Pleural effusion; upper abdominal surgery; pulmonary complications; laparotomy; children; adolescent

Özet

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Introduction

Pleural effusion (PE) is a complication which may develop during the courses of abdominal surgical pathologies (1,2). There are only few studies on this subject enclosing childhood period (3,4). We aimed to define the clinical characteristics of our patients with PE that developed during the treatment period of their primary upper abdominal surgical pathologies.

Case Reports:

Three patients with PE in association with upper abdominal surgical pathologies in the years 2006–2010 were retrospectively evaluated. The following information was collected: age, sex, the type of upper abdominal surgical pathology, association of atelectasis, other complications, localization, and beginning time of PE, pleural fluid characteristics, cultures, radiological investigations and treatment of effusions. The patients’ data are summarized in the table (Table 1).

The first patient was a 16 years old adolescent girl who was operated on for small bowel intussusception due to a Peutz Jeghers type of solitary polyp as the leading point. At the operation, after manual reduction of the invaginated segment, we performed resection of the 15 cm of small bowel segment containing the large solitary polyp and end to end anastomosis. Postoperatively, she needed 80 days of critical care for systemic inflammatory response syndrome and enterocutaneous fistula. She had retractive, hemorrhagical type of PE in association with increased peritoneal fluid. Multiple thoracentesis did not solve the problem and she recovered after 12 days of treatment with tube thoracostomy which was placed on the 16th day of PE (Figure 1a,b).

The second patient was a 16 years old boy who was referred from another hospital with the complaints of abdominal pain and vomiting starting one day before the admission. When the patient was asked, he told a suspicious trauma history in the form of falling from height. Abdominal ultrasonography showed a laceration at the posterior side of the spleen and a subcapsular hematoma located anterolaterally. On the 14th day of his trauma he was thought to have prolonged PE with pleural effusion. The patient had febrile syndrome and enterocutaneous fistula. He was treated with tube thoracostomy after a trial of thoracentesis.
In the third patient (14 years old female), pleural effusion developed after laparoscopic splenectomy for chronic idiopathic thrombocytopenic purpura. After the operation, left subdiaphragmatic abscess complicated the clinical condition and it was drained under the guidance of ultrasonography. The fluid accumulation was treated by thoracentesis and puncture of the pleural fluid (Figure 2).

**Discussion**

Pulmonary complications after laparotomies are rather well known and investigated clinical conditions particularly for the adult patients. PE, which is described as any significant collection of fluid within the pleural space, is a subtype of pulmonary complications and different rates (10-60 %) had been reported for the adult series in the literature (1,2).

These studies mentioned pneumonia and pneumonitis, atelectasis, bronchiectasy, pulmonary embolism and acute respiratory failure following pneumonia as primary pulmonary complications which effect hospitalization duration, morbidity and mortality. Factors predisposing pulmonary complications in adults can be classified as follows (1,2,5):

a) Operational factors: Elective or urgent upper abdominal surgery, the localization of abdominal incision (upper and/or lower quadrants), extended duration of operation (longer than 270 minutes) and multiple surgical procedures.
complications as it was the case in our second patient (8). Detection of following clinical signs led us to diagnose PE in our patients: high body temperature (Over 38°C), presence of decreased respiratory sounds, auscultation and radiological findings on plain chest X rays and computerized tomography. Recovery periods were eventful in all of the patients. In adult series PE was reported after splenic injuries and also as a frequent complication in patients with splenic abscess (9-11). Development of PE following laparoscopic splenectomy was reported in a limited number of pediatric cases. (12,13). Subdiaphragmatic abscess and PE complications following laparoscopic splenectomy can increase morbidity and need adjunct interventions such as drainage of abscess and thoracentheses as in our third patient (14,15). In general, pulmonary complications following upper abdominal surgery in the childhood period has been reported as a rare complication. Surgical pathologies of the pancreas, amoebic abscess of liver, and hepatic lobectomies could be given as the examples causing pulmonary complications (16-18). The pathogenesis and clinical course of pleural fluid accumulation during upper surgical pathologies is not a clearly defined phenomenon. Like in adult patients, we can speculate that the pleural fluid collections may originate from the peritoneal cavity passing directly through pores in the diaphragm or from the irritation of the diaphragm (6).

In conclusion, refractory pleural effusions developing during the course of serious intraabdominal surgical pathologies may increase morbidity. Associated lung atelectasis can also cause problems. Presence of free intraperitoneal fluid and adolescent age may also be risk factors for development of PE. Tube thoracostomy may be needed for the treatment of PE. Children who have had serious operations and/or possibility of longer periods of hospitalisation can benefit from spirometry and lung physiotherapy exercises. Our patients are not uniform, and presenting symptoms of the cases were not specific to PE. For instance, it is not easy to differentiate the source of fever, if it is connected to the primary pathology or by the PE itself. Related criteria should be supported and can be clearly defined with larger series of pediatric patients.

References