Malignant Peritoneal Mesothelioma in a Pediatric Patient Presenting as Traumatic Hemoperitoneum

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Primary diffuse malignant peritoneal mesothelioma (MPM) is a rare malignancy, especially in pediatric patients. We describe a 15-year-old girl with diffuse MPM presenting with bloody ascites, anemia, and abdominal pain, who had a history of blunt abdominal injury about 3 days before admission. Emergent computed tomographic (CT) scans revealed massive ascites with multiple high-density mass-like lesions occupying the mesentery and omentum. The initial clinical presentation was misdiagnosed as traumatic hemoperitoneum. The patient underwent exploratory laparotomy and histologic diagnosis was established by immunohistochemistry.

Key words: Malignant mesothelioma; Peritoneum; Hemoperitoneum

Malignant peritoneal mesothelioma (MPM) is a rare intra-abdominal neoplasm. To our knowledge, this entity has been rarely described in pediatric patients and is easily overlooked. We herein present a girl who had an obvious history of blunt abdominal injury. CT of the abdomen showed massive ascites with numerous soft-tissue mass-like lesions over the mesentery and omentum. Based on the clinical history and presentation, the initial impression would be easily mistaken as traumatic hemoperitoneum. Eventually, the final diagnosis was confirmed by exploratory laparotomy and immunohistochemistry.

CASE REPORT

A 15-year-old girl presented with abdominal pain due to abdominal blunt injury 3 days before admission. Physical examination revealed possible hepato-splenomegaly and a distended abdomen, which was soft and non-tender with shifting dullness on percussion. Normal blood pressure (124/76 mmHg) and pulse rate (68 beats/min) were noted. She was anemic (hemoglobin 9.8 mg/dL, Hct 30%) but other blood chemistry results, including plasma creatinine, serum alpha-fetoprotein, liver function tests, and coagulation studies were normal. A pregnancy test was also negative. The medical history revealed that she had increased abdominal girth and weight loss over the preceding 2 weeks accompanied by occasional episodes of mild abdominal pain, nausea, and diarrhea.

Abdominal sonogram revealed an immense amount of fluid with diffuse heterogenous lesions in the abdomen. CT scan of the abdomen further demonstrated the extent of these lesions (Fig. 1a), showing diffuse heterogenous high-density masses (65-85 H.U.) occupying the entire abdomen. The largest mass measured approximately 14 × 10 × 8 cm in the left lower quadrant of abdomen. These high-
density masses enhanced after intravenous contrast injection (Fig. 1b). The pelvic organs were displaced and engulfed by these masses. Considerable peritoneal fluid was also detected. According to the findings of CT scan, the possible differential diagnoses might include peritoneal carcinomatosis, intra-abdominal tumor with hemorrhage, and traumatic hemioperitoneum with hematoma formation. However, based on the history of blunt abdominal injury, traumatic hemioperitoneum with hematoma is suspected at emergency room.

Abdominal tapping was performed and confirmed that the ascites contained fresh blood. Combining with recent history of abdominal blunt injury, the initial clinical suspicion was traumatic hemioperitoneum.

Few hours after tapping, the patient developed diffuse abdominal tenderness, guarding, rebound pain, and unstable hemodynamically status (BP 84/50 mmHg, PR 124 beats/min). The hemoglobin and hematocrit levels were significantly decreased (hemoglobin 4.5 mg/dL, Hct 21%). Emergent surgical consultation was requested for hemoperitoneum of unknown origin that was followed by immediate surgical exploration. At laparotomy, about 3 L of fresh blood were evacuated and extensive soft tissue masses covering the peritoneum, mesentry, and omentum were removed. Afterwards, the abdominal cavity was irrigated and carefully inspected. No other source of bleeding was identified. Intraoperatively, the patient received 1500 cc of Ringer’s lactate and 2 units of whole blood.

Histological evaluation revealed typical appearance of MPM that was positive for calretinin (Fig. 2), cytokeratin, vimentin, and negative for actin, estrogen receptor, and progesterone receptor. Adjuvant chemotherapy (taxol 200 mg and cisplatin 110 mg) was scheduled for the following months. Carcinogenic embryonic antigen level decreased from 64.59 mg/dL to 15.96 mg/dL. Unfortunately, the patient died of aeruginosa infection with sepsis approximately 3 years later.

DISCUSSION

Malignant mesothelioma is a rare mesenchymal tumor originating from the mesothelial surface cell lining serous membrane, usually associated with asbestos exposure. It arises more commonly from the thoracic pleura, but may rarely developed in the pericardium, peritoneum and tunica vaginalis [1]. Primary diffuse MPM is usually a rapidly fatal peritoneal surface malignancy with median survival less than 1 year. Approximately 80% of reported cases are associated with sterile transudate ascites, and often has an indolent course [2-4]. However, only two pediatric patients with massive bloody ascites and numerous infiltrative intra-abdominal soft-tissue masses have been reported [5, 6].

Most MPM are clinically asymptomatic, while adult patients may present with abdominal pain, incarcerated umbilical hernia, or other symptoms.

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Figure 1. a. Non-contrast enhanced CT scan showed diffuse irregular high-density masses (arrows) occupying in the whole abdomen. The largest one measured about 14 × 10 × 8 cm in the left lower quadrant of abdomen (*). There was also massive ascites (arrowheads), consistent with hemoperitoneum. b. Contrast-enhanced CT scan showed enhancement of these high-density masses (arrows). (arrowheads: ascites; asterisk (*): the largest mass in left lower quadrant of abdomen)
Malignant mesothelioma presenting as hemoperitoneum

suggesting acute inflammatory process such as acute appendicitis or cholecystitis [7, 8]. In contrast, our patient with a history of recent trauma demonstrated massive hemoperitoneum complicated abdominal pain and anemia that would be easily misdiagnosed as traumatic hemoperitoneum. Although the mechanism of hemoperitoneum is uncertain, we postulate that the large peritoneal masses may bleed or result in encasement or straightening of the small mesenteric vessels, leading to subsequent spontaneous hemoperitoneum.

In patients with suspected abdominal lesions, CT scan of abdomen provides vital information regarding the anatomic location, size, and shape of the lesions as well as involvement of adjacent structures. The characteristic CT appearances of MPM are gross ascites with irregular masses involving the omentum and mesentery [2, 3]. However, imaging studies usually cannot lead to a final diagnosis. Lesions that mimic MPM in our patient include traumatic hemoperitoneum with hematomas formation over omentum, peritoneal carcinomatosis, and less likely non-Hodgkin’s lymphoma of peritoneum [9, 10]. In the present case, enhancement of these intra-abdominal masses was noted on contrast-enhanced CT images. Hence, even though there was history of blunt injury, the possibility of intra-abdominal tumors should be taken into considerations rather than traumatic hematomas.

When the diagnosis is confirmed histologically, treatment usually involves both surgery and adjuvant chemotherapy. Despite aggressive management, MPM is often a rapidly fatal condition with a median survival less than 1 year [5, 6]. Our patient underwent surgical exploration with omentectomy and chemotherapy. She survived almost 3 years after surgery.

In conclusion, primary MPM is extremely rare in a pediatric population. With the notable history of trauma in our young patient, primary MPM would not be a differential diagnosis because it masquerades as traumatic hemoperitoneum. However, it should always be considered in pediatric patients with omental or mesenteric masses detected by CT scan.

REFERENCES


Figure 2. The tumor cells (arrows) were immunohistochemically positive for calretinin. (calretinin stain, 400X)
發生於一小兒科患者的惡性腹膜間質細胞瘤：
以疑似創傷後腹膜出血的症狀表現

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原發性惡性腹膜間質細胞瘤是一種罕見的癌症，特別是發生於小兒科的病人更是少見。我們因此報告一罕見發生於15歲小女孩身上的原發性惡性腹膜間質細胞瘤，她入院前出現腹膜出血、貧血，及腹部疼痛的症狀，且於入院三天前有明顯的腹部挫傷病史。急診的電腦斷層發現大量的腹水及在腹膜上有許多的高密度腫塊樣病兆，臨床上一開始誤認為是因為創傷後造成的腹膜出血及血塊，這名小女孩最後接受手術開刀治療，病理診斷確定是原發性惡性腹膜間質細胞瘤。

關鍵詞：惡性腹膜間質細胞瘤：腹膜：腹膜出血