Case Report
Gangrenous appendicitis caused huge retroperitoneal abscess and scrotal abscess: a case report and literature review

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Abstract: Gangrenous appendicitis caused huge retroperitoneal abscess and scrotal abscess are rarely reported. We presented a case who developed both huge retroperitoneal abscess and scrotal abscess after the surgical treatment of gangrenous appendicitis. A 15-year-old male was admitted to our hospital for right low abdominal pain and fever for 2 days. Physical examination showed mild inflamed right scrotum tenderness, red and swollen. Acute gangrenous appendicitis was diagnosed by emergency laparotomy and pathological examination and the appendix was removed by surgery. The patients still presented fever and scrotal swelling after the surgery. CT scan showed irregular honeycomb pneumatosis accompanied by an abscess of the right scrotum epididymis area and the posterior peritoneum. A second laparotomy was performed for aspiration of the fester. Antibiotic treatment and nutritional support were used and the patient recovered and discharged on the 18th day after the surgery. Preoperative CT scan might contribute to the diagnosis of gangrenous appendicitis caused huge retroperitoneal abscess and scrotal abscess.

Keywords: Gangrenous appendicitis, huge retroperitoneal abscess, scrotal abscess

Introduction
Gangrenous appendicitis caused retroperitoneal abscess or scrotal abscess is rare with only several reports [1-4]. Simultaneous appearance of the retroperitoneal abscess and scrotal abscess is more rarely reported [5, 6]. Diana et al. presented a perforated appendicitis patient with a triad of complications (retroperitoneal abscess, hepatic portal venous gas, and rectal perforation) [7]. Herein we presented a case who developed both huge retroperitoneal abscess and scrotal abscess after the surgical treatment of gangrenous appendicitis.

Case presentation
One 15-year-old male patient who was usually in good health was admitted to our hospital on 5th Oct 2014 due to fever for two days and right lower abdominal pain. Physical examination showed a temperature of 38.8°C, a blood pressure of 86/56 mmHg, a pulse rate of 98/min and percussion pain in the right kidney area. There were mildly inflamed scrotum tenderness on the right and rectal tenderness by rectal examination. The routine blood test showed that the white blood count (WBC) was 13.5×10⁹/L and the neutrophil count was 0.73. Abdominal radiography demonstrated right lower abdomen intestine pneumatosis with concomitant small fluid level. B-ultrasonic scan showed an irregular liquid dark area in the right lower quadrant and no obvious mass in the appendix area. Small kidney stone, right epididymis enlargement and rich blood, and a liquid-based hybrid echo area around the testicle were observed. Several diseases such as acute peritonitis, acute appendicitis, renal colic, right epididymitis, and right kidney stones, were suspected.

Emergency laparotomy was further performed. Abdominal cavity presented empyema, and
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right lower quadrant abdominal great omentum was wrapped. Appendix was located the right of the cecum and attached in the back peritoneum. There was a gangrene perforation (diameter 1.5 cm) at the appendix and fecal impaction in appendix root. Surgical removal of the appendix was conducted and the abdominal cavity was washed. After catheter insertion at the rectal fossa and drainage, the abdomen was closed. Specimen pathology confirmed the acute gangrenous appendicitis. On the third day after the surgery, the intestinal function was recovery, but with fever (about 38°C) and gradually swelling in right scrotal. Four days after the surgery, it came ulceration out pus, right groin swelling and tenderness. Abdominal CT 6 days after surgery revealed multiple honeycomb gas with abscess of retroperitoneal and pelvic bottom upwards the kidney dimples and downwards the inguinal canal and the right scrotum (irregular enhancement). This concluded the diagnosis of retroperitoneal and scrotal abscess (Figure 1).

A second surgical exploration suggested that there were no intraperitoneal fluid and special on appendix stump. However, there was a lot of pus in outer pelvic space stretching to the upper left abdominal wall. After cleaning up the pus, repeated wash and multitube drainage were performed. Strengthen anti-infection and supportive treatment were employed after the operation. The wound of the scrotum healed better after dressing the wound. The patient was discharged from the hospital on the 18th day after the second surgery. The right kidney stones were not treated.

Discussion

Recently, an increasing number of the scrotal abscess cases originating from appendicitis have been reported [8-14], and notably, some left scrotal abscess has also been reported. However, complications of retroperitoneal abscess [2, 3, 6], especially cases with both retroperitoneal abscess and scrotal abscess [5]

Figure 1. A-C: CT cross sectional enhancement scanning showed an irregular honeycomb pneumatosis (thin arrow) at the bottom of the pelvic before the bladder, and inguinal canal wall thicken companied with moderate strengthening (thick arrow); right scrotum epididymis area showed a honeycomb pneumatosis (white triangle). D, E: CT coronal and sagittal view enhancement MRP reconstruction showed a large number of honeycomb pneumatosis accompanied with an abscess at the posterior peritoneum and colon side ditch area and ascending to the liver and kidney pit (double thin arrow).
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Table 1. Summary of the reports of retroperitoneal abscess or retroperitoneal abscess and scrotal abscess caused by appendicitis

<table>
<thead>
<tr>
<th>Study</th>
<th>Age</th>
<th>Gender</th>
<th>Disease</th>
<th>Complication</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yildiz 2007</td>
<td>27</td>
<td>Male</td>
<td>Acute appendicitis</td>
<td>Right lower abdominal wall and groin abscess</td>
</tr>
<tr>
<td>Lee 2003</td>
<td>19</td>
<td>Male</td>
<td>Appendicitis</td>
<td>Right scrotal abscess and retroperitoneal abscess</td>
</tr>
<tr>
<td>Moussai 2008</td>
<td>--</td>
<td>--</td>
<td>Perforated appendicitis</td>
<td>Retroperitoneal gangrene</td>
</tr>
<tr>
<td>Tomasoas 2008</td>
<td>76</td>
<td>Male</td>
<td>Perforated appendicitis</td>
<td>Retroperitoneal abscess and extensive subcutaneous emphysema</td>
</tr>
<tr>
<td>Diana 2010</td>
<td>43</td>
<td>Male</td>
<td>Perforated appendicitis</td>
<td>Retroperitoneal abscess, hepatic portal venous gas, rectal perforation</td>
</tr>
<tr>
<td>The present case</td>
<td>15</td>
<td>Male</td>
<td>Gangrenous perforated appendicitis</td>
<td>Right scrotal abscess and retroperitoneal abscess</td>
</tr>
</tbody>
</table>

are still rare. We have reviewed previous literature reported the retroperitoneal abscess or retroperitoneal abscess and scrotal abscess caused by appendicitis (Table 1). There are five reports on retroperitoneal abscess and one reported both retroperitoneal abscess and scrotal abscess caused by appendicitis. In our present study, we reported a 15-year-old patient who developed huge retroperitoneal abscess and scrotal abscess following gangrenous appendicitis removal.

The retroperitoneal space located between the peritoneal of the posterior abdominal wall and the fascia, and interlinked upward to posterior mediastinum through psoas & rib triangle and downward to the continuation of pelvic fascia gap which is divided into prevesical space, retrorectal space and pelvic rectal space [15]. The infection in retroperitoneal space is easy to spread even to scrotum and trigonum femorale, since it consisting a lot of connective tissue. In the present report, the patient was thin and the appendix located on the outside of the cecum cling to the peritoneum. The infection that fecal impaction-induced perforated appendicitis was easy to spread to the scrotum through the retroperitoneal space. However, though there was preoperative scrotal swelling pain and effusion, it did not raise enough attention to perform posterior abdominal exploration and it was firstly diagnosed “epididymitis”. Because of that, the patient had a continued high fever until scrotal abscess rupture. Then we had to perform the second operation until CT revealed the huge peritoneal abscesses.

There are several lessons from this case. We should follow the commonly encountered disease principle and unified principle in diagnosis. The common disease and the frequently occurring disease should be firstly considered. When the evidence cannot be explained, the rare disease should be considered. The unified principle requires us to explain all clinical evidence by one disease as possible, in order to hold the crucial point and to reduce the chance of misdiagnosis. In this case, both general surgeons and the urology surgeons hold purely one-sided point of view from their own specialist to consider the issue, leading to the deviation. Several diseases including acute peritonitis, acute appendicitis, renal colic, right epididymitis, and right kidney stones, were diagnosed at the first. Gangrenous appendicitis caused huge retroperitoneal abscess and scrotal abscess was diagnosed until the CT scan was performed because of the continued fever and right scrotal swelling aggravating. Preoperative CT may contribute to diagnosis [2], but because an early shock occurred in the patient, CT scan could not be performed.

Furthermore, the surgeon should be familiar with the local anatomy of surgery perimeter. The retroperitoneal space and pelvic fascia which were less involved should also be clearly kept in mind. Careful exploration, especially the preoperative CT scan, if possible, should be employed to reduce the misdiagnosis and to benefit the rehabilitation of patients.

Disclosure of conflict of interest

None.

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