Case Report
Urachal actinomycosis mimicking carcinomatosis: a case report and review of literature

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Abstract: Actinomyces Israeli is found to be generally involved with cervicofacial (60%), followed by abdominopelvic (25%) and thoracic (15%) region. However, urachal actinomycosis is an extremely rare occurrence, represented by limited cases. This report described a 41-year-old man infected with Actinomyces Israeli who underwent partial cystectomy. Histological examination showed the typical colony which led to the diagnosis of A.Israeli infection. Finally, he was discharged home after a 4-month course of intravenous penicillin without significant complications. Review of the English literature revealed seven cases of urachal actinomycosis in the recent two decades. The median age was 37 years (range, 22-70) with a male/female ratio of 1.3:1. The treatment of A.Israeli was antibiotics combined with surgery. The duration of antibiotic therapy ranged from three to six months. Urachal actinomycosis is a relatively infrequent disease with nonspecific clinical and radiological features and is easily confused with urachal carcinoma.

Keywords: Urachal actinomycosis, actinomyces israeli, actinomyces, actinomycosis

Introduction

Human actinomycosis is a chronic granulomatous inflammation caused by Actinomyces Israeli, a gram-positive anaerobic bacterium [1-3]. A.Israeli usually infects men more frequently than women, predominantly individuals aged 20-50 years. A.Israeli is histologically characterized by Gram-positive, branching and filamentous anaerobes surrounded by fibrosis and inflammation [4]. Surgical approach remains the mainstay treatment for patient infected with A.Israeli. Long-term antibiotic therapy after surgical resection can achieve complete remission of more than 95%.

Precise diagnosis is obtained preoperatively in fewer than 10% of cases, and it is often made in the operation period, which confirmed later by pathologic examination. And early diagnosis is important to minimize the A.Israeli invasion and to prevent unnecessary therapeutic approach and inappropriate tissue removal, because actinomycosis usually has a variety of clinical manifestations, which could mimic a tumor or other inflammatory disease.

Herein, we presented an assessment of a 41-year-old man with urachal actinomycosis which was diagnosed by histopathological examination of a specimen obtained by excisional biopsy.

Case report

A 41-year-old man was admitted to our institute who mainly complained of lower abdominal mass with hypogastric pain and frequency-urgency-dysuria syndrome for half a month’s duration. There was no history of hematuria or fever. The symptom gradually improved after anti-inflammatory treatment. A palpable mass about 4×5 cm was found at suprapubic bladder region during physical examination. Laboratory studies showed normal hematological and biochemical profiles except for RBC (+ + +), WBC (+ + +) during routine urine examination. Meanwhile, Urine culture revealed no abnormality and no tumor cells were found by urine cytology for three times. Ultrasonographic record demonstrated a hypoechoic mass on the anterior wall of the bladder, measuring about 4×6 cm. Abdominal Computed tormography...
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Phy (CT) showing a predominantly mass about 4.5×3.5 cm involving the anterior abdominal wall and dome of the bladder (Figure 1).

It was suspicious of urachal carcinoma on the basis of imaging features and surrounding tissues involvement. Partial cystectomy was performed subsequently. On operation, it revealed a mass situated on the anterior bladder, and accompanied with the surface of the mass mucosa were hyperemia and edema. Histological examination showed the typical colony which led to the diagnosis of A. Israelii infection. As depicted in Figure 2, dark, dense and filamentous aggregates extended from a central core, along with inflammatory cell infiltration, which generally revealed marked abscess and fibrosis containing A. Israelii organisms. And the final diagnosis was pathologically consistent with A. Israelii with sulfur granules.

Following identification of the diagnosis of A. Israelii, the patient was treated with a 4-month course of intravenous penicillin without significant complications. Finally, he was discharged home 1 week later without any recurrence.

Discussion

Actinomycosis is a chronic infection caused by Actinomyces family, with A. Israelii being the primary etiologic agent. Other species that have been reported in human include A. naeslundii, A. viscosus, A. odontolyticus, A. gerencseriae, and A. meyeri, A. neuii [5, 6]. A. Israelii, a common flora, is found to be generally involved with cervicofacial (55%), followed by abdominopelvic (20%) and thoracic (15%) region [7-12]. However, urachal actinomycosis is an extremely rare occurrence, represented by limited cases.

According to the PubMed database, about seven cases of urachal actinomycosis were recorded in English language in the recent two decades [13-19] (Table 1). The median age was 37 years (range, 22-70) with a male/female ratio of 1.3:1. The treatment of A. Israelii was antibiotics combined with surgery in the seven cases above. The duration of antibiotic therapy ranged from three to six months. Most patients recovered after a long period of treatment.

Urachal actinomycosis is extremely to diagnose because of unsuccessful cultures with 76% negative rate, and it theoretically requires 5-7 days but may take 2-4 weeks actually. Furthermore, A. Israelii could also be morphologically confused with other gram-positive, non-spore forming bacilli and even non-related bacteria including clostridia, corynebacteria, listeria, and leptotrichia. Besides, the organism might also be classified as a fungus for mistake because of its filamentous appearance and indolent growth that mimicked mycotic infection. However, the absence of a nuclear membrane or chitin in the cell membrane as well as reproduction by fission is among the main characteristics which led to its reclassification as a bacterium and not a fungus.

In addition to failures in culture, nonspecific clinical features and imaging characteristics may also lead to indefinite diagnosis of A. Israelii. Thus, final identification must be confirmed with histological findings of sulfur granules and
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Table 1. Summary of five cases of human urachal actinomycosis due to A. Israelii

<table>
<thead>
<tr>
<th>Publication year</th>
<th>Patient details*</th>
<th>Clinical presentation</th>
<th>Duration of symptom# (days)</th>
<th>Treatment</th>
<th>Antibiotic duration (months)</th>
<th>Outcome</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>28, male, India</td>
<td>Abdominal mass</td>
<td>20</td>
<td>Penicillin; resection</td>
<td>Unknown</td>
<td>Recovered</td>
</tr>
<tr>
<td>2011</td>
<td>57, male, China</td>
<td>Abdominal mass</td>
<td>60</td>
<td>Amoxicillin, clavulanate; resection</td>
<td>5</td>
<td>Recovered</td>
</tr>
<tr>
<td>2010</td>
<td>26, male, Korea</td>
<td>Abdominal mass</td>
<td>Unknown</td>
<td>Fluoroquinolone; cystectomy</td>
<td>3</td>
<td>Recovered</td>
</tr>
<tr>
<td>2001</td>
<td>70, female, China</td>
<td>Infrabumilcal mass</td>
<td>60</td>
<td>Doxycycline; laparotomy</td>
<td>6</td>
<td>Recovered</td>
</tr>
<tr>
<td>1999</td>
<td>22, male, Italy</td>
<td>Umbilical public mass</td>
<td>150</td>
<td>Amoxicillin; laparotomy</td>
<td>6</td>
<td>Recovered</td>
</tr>
<tr>
<td>1995</td>
<td>31, female, Britain</td>
<td>Suprafural mass</td>
<td>Unknown</td>
<td>Penicillin, chloramphenicol; laparotomy</td>
<td>Unknown</td>
<td>Unknown</td>
</tr>
<tr>
<td>1991</td>
<td>25, female, Africa</td>
<td>Umbilical public mass</td>
<td>Unknown</td>
<td>Penicillin; surgery</td>
<td>Unknown</td>
<td>Recovered</td>
</tr>
</tbody>
</table>

Notes: * (age, gender, country of origin); # before diagnosis.

filamentous gram-positive rods, on the basis of tissue resection, percutaneous needle biopsy or fluid aspiration. Up to now, several risk factors have been found to be associated with urachal actinomycosis, the most common being urachal remnants. Other relevant factors may be involved with renocolic or renoduodenal fistulas. According to sporadic reports, immunocompromised disorder, such as diabetes mellitus, steroid therapy and neoplasm, is additional significant predisposing factors for human actinomycosis.

Diagnosis is seldom possible because of the difficulty in differentiating the inflammation or pseudotumor from urachal malignancy, especially the aggressive nature of it, including abscess formation and pus accumulation followed by partial necrosis and reactive fibrosis. CT, ultrasound and MRI enable confirmation of the presence of an abscess or pseudotumor, but could not distinguish with urachal carcinoma because of its infiltrative and granulomatous inflammation. The Gram stain of specimen is usually more sensitive than cell culture, especially prior antibiotics were administrated. The treatment is a combination of surgical resection and long-course antibiotic therapy. Awareness of this diagnostic entity may enable the urologist to implement therapeutic approach and minimize the unnecessary demand for excessive organ resection.

In summary, urachal actinomycosis is a relatively infrequent disease with nonspecific clinical and radiological features and is easily confused with urachal carcinoma because of its infiltrative and granulomatous inflammation. The Gram stain of specimen is usually more sensitive than cell culture, especially prior antibiotics were administrated. The treatment is a combination of surgical resection and long-course antibiotic therapy. Awareness of this diagnostic entity may enable the urologist to implement therapeutic approach and minimize the unnecessary demand for excessive organ resection.

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Disclosure of conflict of interest

None.

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References

[1] Zaman R, Abbas M, Burd E. Late prosthetic hip joint infection with actinomyces israeli in an intravenous drug user: case report and litera-
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