Multiple cutaneous lesions of *Mycobacterium abscessus* in a child

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Summary

Cutaneous *Mycobacterium abscessus* (*M. abscessus*) infection has been reported in children following surgical procedures, injections and accidental trauma in contaminated aqueous environments. We present a case of an immunocompetent 8-year-old girl who developed multiple cutaneous lesions on her abdomen and chest after being scratched by a rabbit whilst playing in newly delivered soil. A fine needle aspiration of a fluctuant nodule cultured *M. abscessus* and oral monotherapy with clarithromycin resulted in clinical resolution of the lesions by 6 months. This case highlights an interesting acquisition and clinical presentation of *M. abscessus* in an immunocompetent child with diagnosis by fine needle aspiration and resolution with oral clarithromycin monotherapy.

KEY WORDS: mycobacterium abscesses; child; multiple cutaneous lesions.

Introduction

*M. abscessus* is a non-tuberculous mycobacterium ubiquitous to soil, water and dust (1). It was first described in 1953 by Moore and Frerichs when it was grown from a gluteal abscess (2). *M. abscessus* belongs to the Runyon group IV classification of rapid-growing mycobacteria which also includes *M. chelonae* and *M. fortuitum* (3). Originally classified as *M. chelonae spp. abscessus* it was proved to be a separate micro-organism by DNA hybridisation studies in 1992 (4). Localised cutaneous infection is typically found at sites of trauma in immunocompetent hosts, whilst disseminated cutaneous infection is more common in immunocompromised hosts (5-7). We present a case of widespread cutaneous *M. abscessus* infection on the abdomen and chest of an immunocompetent 8-year-old girl following a rabbit-scratch whilst playing in soil.

Case report

An 8-year-old Caucasian girl presented with a 3-month history of multiple non-healing, enlarging, erythematous lesions over her chest and abdomen. The lesions appeared one week after playing with a pet rabbit in newly delivered soil. Whilst no cuts or abrasions were noted at that time, she did recall being scratched on the chest by the rabbit. She had no history to suggest underlying disease or immunocompromise and she had not received the BCG vaccine. Her brother who was exposed to the soil but not the rabbit scratch, did not develop any clinical disease.

Examination revealed fifteen lesions scattered over her chest and abdomen, ranging from 0.5 cm papules to 4 cm fluctuant cystic nodules which were slightly tender on palpation (Figure 1). There was no lymphadenopathy and she was systemically well.

A fine needle aspiration of the most prominent nodule yielded 1 ml of thick purulent fluid. *M. abscessus* was isolated and confirmed with rRNA gene sequencing at the regional Mycobacterial reference laboratory within 7 days thus avoiding a surgical biopsy. We surmise that the sites of inoculation were caused by the rabbit scratch and the source of the infection was the soil however no microbiological investigations of the soil were performed. Further investigations showed normal full blood count, C-reactive protein, liver function, HIV serology, immunoglobulin levels and neutrophil oxidative burst.

*M. abscessus* was sensitive to clarithromycin, amikacin and cefoxitin, displayed intermediate susceptibility to imipenem and was resistant to amoxicillin/clavulanate, erythromycin, co-trimoxazole, sulphamethoxazole, tetracycline, ciprofloxacin, minocycline and roxithromycin. The patient was commenced on oral clarithromycin 375 mg twice daily (25 mg/kg/day) for a total of 8 months. One nodule spontaneously discharged yellow-green pus after commencement of therapy. After 4 months of treatment there was a reduction in size and number of the lesions, resolution of tenderness and no development of further lesions (Figure 2). After 8 months of treatment the lesions had resolved leaving...
Discussion

In children, cutaneous *M. abscessus* infection has been reported following surgical procedures, injections and accidental trauma in contaminated aqueous environments. Presentation of cutaneous infection may include papules, plaques, nodules, abscess formation and non-healing ulcers. Localised cutaneous infection is typically found in immunocompetent hosts at sites of trauma, whilst disseminated cutaneous infection is more common in immunocompromised hosts and can be associated with internal infection (1, 6, 7). Multiple reports of cutaneous infection with *M. abscessus* have been described in the adult population however the literature in the paediatric population is limited (Table 1) (6, 8, 9, 10-14).

A high index of suspicion is required to achieve a microbiological diagnosis as mycobacterial cultures are not routinely performed on skin biopsy specimens, surgical wound debridements or cutaneous abscesses (7). The diagnosis is made by culture of tissue or draining pus. The culture of biopsy material is stated to be the optimum method of diagnosis however this can be both painful and traumatic in children. In our case a fine needle aspirate was sufficient to make the diagnosis and was well tolerated by the patient. The three pathogenic species of rapidly growing mycobacteria have variable interspecies and intraspecies
Mycobacterium abscesses in a child

Table 1 - Reports of cutaneous infection with M. abscessus in paediatric population.

<table>
<thead>
<tr>
<th>Cases</th>
<th>Age</th>
<th>Site of entry</th>
<th>Source</th>
<th>Location</th>
</tr>
</thead>
<tbody>
<tr>
<td>Villanueva et al. (1997)</td>
<td>7yrs-81yrs</td>
<td>Injection site</td>
<td>Likely tap water used to clean reusable injector used for injections</td>
<td>Barranquilla, Columbia</td>
</tr>
<tr>
<td>Wagner et al. (2004)</td>
<td>4mths-11yrs</td>
<td>Surgical site</td>
<td>Tap water &amp; defective autoclave</td>
<td>New Delhi, India</td>
</tr>
<tr>
<td>Zhibang et al. (2002)</td>
<td>1yr-80yrs</td>
<td>Injection site</td>
<td>Soil contaminating lids of bottles of penicillin G</td>
<td>Chongqing, China</td>
</tr>
<tr>
<td>Dytoc et al. (2005)</td>
<td>1yr-15yrs</td>
<td>Minor abrasions/trauma to hands and feet</td>
<td>Rubber mat in public wading pool</td>
<td>Alberta, Canada</td>
</tr>
<tr>
<td>Yuan et al. (2009)</td>
<td>8mths-96yrs</td>
<td>Injection site</td>
<td>Extrinsic contamination from reuse of syringes in multiple dose bottles of normal saline</td>
<td>Rural clinic in Guangdong Province, China</td>
</tr>
<tr>
<td>Brantley et al. (2006)</td>
<td>12yrs</td>
<td>Insect bite</td>
<td>Contaminated pond water</td>
<td>Texas, United States</td>
</tr>
<tr>
<td>Ng et al. (2015)</td>
<td>5yrs-15yrs</td>
<td>Minor trauma, insect bite, injection site, unknown</td>
<td>Contaminated swimming pool, unknown</td>
<td>Singapore</td>
</tr>
<tr>
<td>Sinagra et al. (2014)</td>
<td>4yrs-10yrs</td>
<td>Unknown</td>
<td>Contaminated swimming pool, unknown</td>
<td>Rome, Italy</td>
</tr>
<tr>
<td>Our case</td>
<td>8yrs</td>
<td>Minor trauma from rabbit scratch</td>
<td>Contaminated soil</td>
<td>Brisbane, Australia</td>
</tr>
</tbody>
</table>

Antimicrobial sensitivities, thus susceptibility testing should be performed (1). A number of medical treatment regimens for M. abscessus has been reported depending on the extent of the disease and underlying immune status of the host. Treatment of localized M. abscessus cutaneous infection is generally accepted to be with oral clarithromycin as monotherapy for a duration of at least 4-6 months. Combination therapy including clarithromycin and parenteral agents such as amikacin, cefoxitin or imipenem is recommended for treatment of disseminated infection, pulmonary infection, immunocompromised or extensive cutaneous disease. Surgical incision and drainage or debridement in conjunction with medical treatment have been advocated when abscesses are present (9, 14). Our patient had extensive cutaneous disease involving the abdomen and chest wall but was systemically well and not immunocompromised. This case demonstrates that in carefully selected patients oral monotherapy can be sufficient for clinical cure even for extensive cutaneous disease.

References