Atypical cervico-facial mycobacterial infections in childhood

S. Makhani, K. R. Postlethwaite, N. M. C. Renny, C. J. Kerawala, A. T. M. Carton

Department of Maxillofacial Surgery, Newcastle General Hospital, Newcastle Upon Tyne; Department of Oral and Facial Surgery, Sunderland District General Hospital, Sunderland, UK

SUMMARY. We describe three patients who presented with atypical mycobacterial infection. Although antituberculous drugs are ineffective, combination treatment with clarithromycin or amikacin and ciprofloxacin (with or without cotrimoxazole) leads to eventual resolution of the lesions. The treatment of choice, however, remains complete excision of the affected area which obviates the need for prolonged chemotherapy and minimizes the scarring which may otherwise develop after conservative treatment.

INTRODUCTION

Unilateral persistent cervico-facial lymphadenopathy in children and adolescents may be difficult to diagnose. Atypical mycobacterial infections are causing increasing numbers of cases of lymphadenopathy, possibly as a consequence of increased diagnostic awareness and improved methods of detection or culture, but the condition remains uncommon enough for it to be low in the list of differential diagnosis. This may lead to a delay in the appropriate investigations, prolongation of treatment, and a poor eventual outcome.

These three case reports reinforce the potential differences in outcome between conservative treatment and curative excision.

CASE REPORTS

Case 1

A 2-year-old white girl was referred by her general practitioner with a swelling at the lower border of the mandible which had developed suddenly and persisted without associated symptoms over a 2-week period. On examination the patient had no fever and was generally well. There was a 3 cm diameter non-fluctuant swelling in the right submandibular triangle with erythema of the overlying skin. There were no other abnormalities visible in any system.

A provisional diagnosis of cervico-facial lymphadenitis of unknown cause was made and the patient admitted for empirical treatment with intravenous cephalaxin and metronidazole. Full blood count and radiographs were within normal limits and a Mantoux test was negative. The swelling failed to resolve after 3 days of treatment and the patient therefore underwent fine needle aspiration biopsy from which Mycobacterium avium-intracellularre was cultured. She was then given intravenous treatment with azithromycin, ciprofloxacin, and co-trimoxazole. The swelling remained unchanged after 5 days of treatment and on the advice of the microbiologist amikacin was added. She was discharged 3 weeks later taking the antibiotics orally.

At review over the next 4 months the swelling gradually decreased in size. During this period Mycobacterium avium-intracellularre was cultured from the aspiration biopsy specimen and oral antibiotic treatment continued for a further month until a gastrointestinal upset required cessation of treatment. The swelling continued to settle over the next 6 months leaving a hypertrophic scar (Fig. 1) which is currently responding to silastic gel dressings. Revision of the scar is envisaged at a later date.

Case 2

A 15-year-old girl was referred by her general practitioner with a 5-day history of a tender swelling in the left submandibular triangle which had remained unchanged despite a course of amoxycillin given orally. The patient...
described no associated symptoms and was generally well. On examination there was a firm 2 x 2 cm swelling with no evidence of intra-oral disease or other lymphadenopathy. Routine haematological indices, orthopantomograph, and chest radiograph were within normal limits. Further treatment with metronidazole orally reduced the swelling over a period of a week. Tests for toxoplasmosis were negative as was a Mantoux test. At review a week later the lesion had increased in size and intradermal testing for atypical mycobacteria was performed in the paediatric department. Testing for Mycobacterium scrofulaceum was negative but positive responses were obtained for Mycobacterium avium-intracellulare and Mycobacterium malmoense.

The patient was admitted for excision of the involved lymph node under general anaesthesia. Histological examination showed that the left submandibular lymph nodes had been extensively replaced by multiple confluent epithelioid cell granulomatus associated with Langhans-type giant cells and areas of necrosis consistent with atypical mycobacterial infection. The patient made an uneventful recovery with minimal scarring (Fig. 2).

Case 3

A 2-year-old girl was referred by the paediatric department with a 1-month history of a persistent swelling on the right cheek. On examination she was fit and generally well with a firm 2 x 1.5 cm non-tender, non-fluctuant swelling in the substance of the right cheek. No associated disease was evident and a provisional diagnosis of either facial lymphadenitis or atypical mycobacterial infection was made.

A fine needle aspiration biopsy was carried out under a general anaesthetic which showed the infection to be granulomatous.

The patient was given clarithromycin and ciprofloxacin orally while she underwent intradermal testing for mycobacteria. These were positive for Mycobacterium avium-intracellulare and Mycobacterium scrofulaceum but negative for Mycobacterium malmoense. A Mantoux test was mildly positive.

At review 3 weeks later there was some evidence of clinical deterioration with tethering and erythema of the overlying skin. She was given amikacin and co-trimoxazole intravenously in addition clarithromycin orally and remains under review (Fig. 3).

DISCUSSION

Atypical mycobacteria or non-tuberculous mycobacteria are slow growing, acid-fast, Gram positive obligate aerobes which are found naturally in soil, dust, water, and foods such as eggs, vegetables, and milk. Although there are 19 species known worldwide, most infections in Europe are caused by just six species. Mycobacterium avium-intracellulare is the most common infecting organism, followed in decreasing order by Mycobacterium malmoense, Mycobacterium chelonei, Mycobacterium scrofulaceum, Mycobacterium kansasii and Mycobacterium marianum. Though the infecting strains vary with the geographical location these infections are relatively common in warm, dry climates and so are rare in the United Kingdom. It is thought that the disease is transferred through animal vectors although human to human transmission has been reported.

In children the most common atypical mycobacterial infection is cervical lymphadenitis although involvement of skin, joints, and bones have been described. Infection is most prevalent in girls below 5 years of age although it remains relatively more common than Mycobacterium tuberculosis cervical-facial infection in children up to the age of 12. Most lesions affect a single site. Systemic infection...
Atypical cervico-facial mycobacterial infections in childhood 121

may occur in imuno-compromised patients, notably those with AIDS. Diagnosis may be difficult and cervico-facial mycobacterial infection has been confused with lymph node hyperplasia, cat-scratch disease, infectious mononucleosis, mumps, development cysts, and cancer. Wary clinicians may, however, make the diagnosis on clinical grounds alone if the characteristic features are present.

The patient is usually a healthy white child 2-5 years old with unilateral lymphadenopathy of the superior cervical nodes. The patient is usually well with no systemic signs or symptoms. The affected nodes are firm, rubbery, and non-tender with occasional erythema of the overlying skin. Rarely there are confluent matted nodes or a draining sinus. Without adequate treatment the involved nodes usually soften, rupture spontaneously and drain, often forming a persistent sinus. Spontaneous regression of nodes with calcification and fibrosis has been reported but is rare.

After the history has been taken and a complete physical examination made, any child suspected of having an atypical mycobacterial infection should be referred to a paediatric department for further evaluation. A chest radiograph may be performed to exclude tuberculosis but will be within normal limits in atypical mycobacterial infection. Mantoux or Tine testing may also be carried out but are variable and the responses unreliable. Confirmation of the diagnosis is best obtained by skin testing with purified protein derivative (PPD) of the suspected range of atypical mycobacterial species. In case of confirmed atypical mycobacterial infection the involved lymph node(s) should be excised completely, if necessary with overlying subcutaneous tissue and skin, and sent for histological examination and culture. Histopathological examination shows that the involved lymph nodes have been replaced by epithelioid cell granulomata and Langhans-type giant cells, and suggest tuberculosis. Acid-fast bacilli may be shown initially with the fluorescent dye auramine 'O' under ultraviolet light, and subsequently confirmed by Ziehl-Neelsen staining. Culture of atypical mycobacteria may take several weeks but is important in case excision of the involved nodes was incomplete. Most atypical mycobacteria are resistant to standard and adjuvant antituberculous drugs and each strain may have different antibiotic susceptibilities. The current regime of clarithromycin or amikacin and ciprofloxacin, with or without co-trimoxazole, is not required if excision of the involved nodes is complete. In cases in which excision was incomplete prolonged chemotherapy is necessary although it may encourage only slow resolution of the affected area and indurated scars will form.

Needle aspiration biopsy in conjunction with chemotherapy has been advocated to treat patients with multiple affected nodes or in instances in which cervical nodes lie immediately adjacent to important anatomical structures, for example, the facial nerve. Incision and drainage or open biopsy of the affected lymph nodes is common when the diagnosis is uncertain; it is associated with sinus formation, and slow, scarring resolution of the involved area. Such scars often need to be excised to produce resolution and may require revision at a later date to produce

---

**Nodal Status**

<table>
<thead>
<tr>
<th>Skin Test</th>
<th>FNAB</th>
<th>Surgical Excision</th>
</tr>
</thead>
<tbody>
<tr>
<td>Positive</td>
<td>Positive</td>
<td>Review Diagnosis</td>
</tr>
<tr>
<td>Negative</td>
<td>Negative</td>
<td>Chemotherapy</td>
</tr>
</tbody>
</table>

---

Fig. 4
cosmetic improvement. The use of silastic gel dressings may reduce the long term need for surgery.

Early diagnosis of atypical mycobacterial infections and complete excision of the affected area remains the mainstay of treatment and removes the need for prolonged antimicrobial treatment and further surgical revision. Clinical circumstances may, however, dictate a more conservative approach despite it being less than ideal. With this in mind we have constructed an algorithm (Fig. 4) for the treatment of patients suspected of having atypical cervico-facial mycobacterial infections.

References

The Authors
S. Makhani BDS
Senior House Officer
C.J. Kerawala MBBS, FDSRCS
Higher Surgical Trainee
K.R. Postlethwaite FRCS, FDSRCS
Consultant Oral and Maxillofacial Surgeon,
Department of Maxillofacial Surgery,
Newcastle General Hospital,
Westgate Road,
Newcastle Upon Tyne NE4 6BE
N.M.C. Rennv FRCS, FDSRCS
Higher Surgical Trainee
A.T.M. Carton MA FDS FFD FRCS
Higher Surgical Trainee,
Department of Oral and Facial Surgery,
Sunderland District General Hospital,
Kyll Road,
Sunderland SR4 TTP
Correspondence and requests for offprints to S. Makhani.
Paper received 30 May 1995
Accepted 7 August 1995