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Extra-pulmonary tuberculosis developing at sites of previous trauma

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Summary We describe five individuals in whom extra-pulmonary tuberculosis appeared to localise at a site of previous blunt injury. We review other similar case reports where preceding trauma was blunt and non-penetrating, and discuss a possible mechanism involving transport of mycobacteria in monocytes to sites of injury during "latent" tuberculosis infection. This challenges the conventional model proposed for mycobacteria dissemination in tuberculosis disease.
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Introduction

In the late 19th Century and early 20th Century — at the peak of the tuberculosis (TB) epidemic in Europe and North America — a causal relationship between trauma and TB was widely accepted.[1] Here we report five case histories where extra-pulmonary TB appeared to localise at a site of previous trauma. We review other similar case reports and discuss a possible mechanism involving transport of mycobacteria in monocytes to sites of injury during 'latent' tuberculosis infection.

Patient 1

A 47 year old Gujarati woman gave a history of trauma to her left anterior chest 4 months prior to presentation (a punch during an attempted street robbery), as well as a history of fever in the mornings and swelling in her left breast, both for 4 weeks. There was no previous history of TB. Mammography confirmed a breast mass involving the chest wall. Computed Tomography (CT) scan showed a low density lesion in the left parasternal region extending through the chest wall at the 4th rib. Extensive mediastinal

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lymphadenopathy was also present (Fig. 1A). Her Mantoux test was strongly positive (30 mm induration). A needle aspirate was performed: the material was acid fast bacilli (AFB) negative but grew fully sensitive *Mycobacterium tuberculosis*. The mass responded to standard anti-tuberculosis therapy with 2 months rifampicin, isoniazid, pyrazinamide and ethambutol, followed by 4 months rifampicin and isoniazid continuation phase.

Patient 2

A 29 year old man, originally from Mumbai, gave a history of a head injury 7 months previously. This initially caused him localised pain which resolved over a few days. However, 6 weeks later a small swelling developed at the site of injury which progressed in size over 5 months. On examination he had a temperature of 37.6 °C, a hemi-spherical fluctuant 7 × 7 cm mass overlying the upper midline of his frontal bone, and no neurological deficit (Fig. 1B). There was no previous history of TB. Erythrocyte Sedimentation Rate (ESR) and C-reactive protein (CRP) were raised at 37 mm/h and 53 mg/L respectively, and Mantoux positive (24 mm induration). Chest radiograph was normal. An ultrasound confirmed a large fluid filled collection under the skin of the scalp. An aspirate showed necrotic material but no AFB and the culture subsequently confirmed fully sensitive *M. tuberculosis*. He was commenced on standard anti-tuberculosis therapy and made a full recovery.

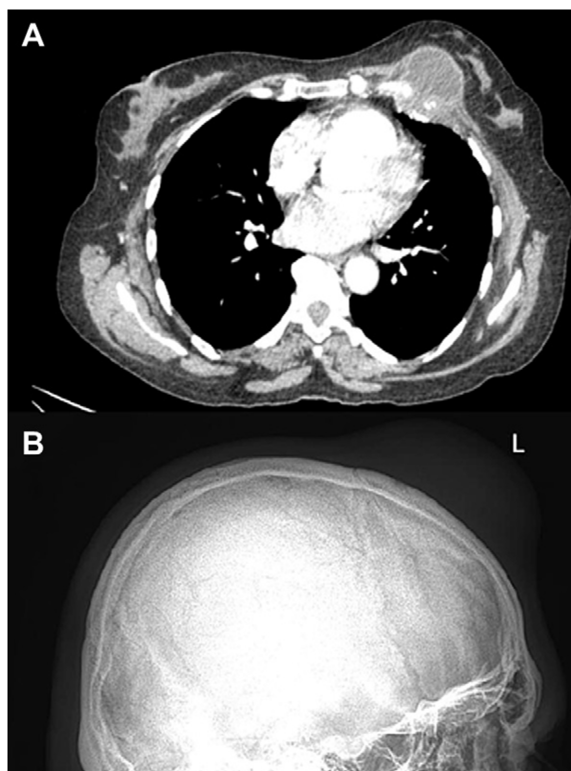

Figure 1 A: Cross sectional Computed Tomography (CT) image from patient 1. A low density lesion in the left parasternal region extending through the chest wall at the 4th rib, and extensive mediastinal lymphadenopathy, is seen. B: Plain lateral skull radiograph from patient 2. A soft tissue density swelling overlying the frontal bone is visible.

Patient 3

A 46 year old man from Northern India living in London for 18 months, sustained an injury from a cricket ball to his lateral right ankle in July 2008. This resulted in moderate pain and swelling that resolved over a period of <2 weeks. In August 2008 there was a recurrence of the swelling and pain. There were no systemic symptoms. He was managed by orthopaedic surgeons with incision and drainage of a presumed infected haematoma on the lateral malleolus, followed by oral clarithromycin. Routine bacterial cultures of the aspirated pus were negative at this time. In November 2008 the patient experienced a recurrence of pain and swelling at the site of the previous injury. By January 2009 he was struggling to walk due to pain and recorded a temperature of 37.7 °C. Upon re-referral to orthopaedics, a tender but not hot 6 × 6 cm lateral malleolus abscess was incised and drained. Microscopy of the drained pus showed white cells and squamous epithelial cells, with no organisms on Gram staining, and AFB negative. A Mantoux test was strongly positive (45 mm induration and blistering). Chest radiograph showed no evidence of pulmonary TB. The pus from the second incision and drainage was sent for mycobacterial culture and fully sensitive *M. tuberculosis* was isolated. He was treated with standard anti-tuberculosis therapy and made a full recovery.

Patient 4

A 39 year old Somali man living in the United Kingdom for ~10 years described falling heavily on his lower back whilst playing football 1 year earlier, following which he required 2 weeks off work with back pain. Subsequently he experienced occasional mild residual pain, which became increasingly severe 10 months after the injury, resulting in inability to work. Examination revealed marked sacroiliac tenderness with a plain radiograph and CT scan of the pelvis demonstrated significant bony lysis of the right ileum with surrounding soft tissue oedema. His CRP was 18 mcg/L and his Mantoux test was positive (24 mm induration). Biopsy of the lesion failed to yield a representative sample and cultures were negative. He was treated for TB osteomyelitis with standard therapy; his pain improved after 1 month of treatment and his symptoms had resolved by 6 months. Repeat imaging showed improvement of the bony destruction.

Patient 5

A 74 year old white British woman was admitted to her local district general hospital on the west coast of Scotland in June 2011 with pain, swelling and pus discharging from her left elbow. She had caught it on a door handle ~6 months prior to this and pain and swelling at the site had been treated with antibiotics as a simple cellulitis, but without effect. She had a past history of a ‘pulled’ left elbow as

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