CASE REPORT

Tuberculosis of the calcaneum masquerading as Haglund's deformity: a rare case and brief literature review

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SUMMARY

An Asian man presented to the Foot and Ankle Clinic with a 5-month history of right ankle pain of gradual onset. He had a non-fluctuant swelling around the Achilles tendon insertion with a tender palpable lump. Radiograph demonstrated Haglund's deformity and also possible calcification at the attachment of the Achilles tendon for which he had an injection of a local anaesthetic and a steroid to treat the insertional Achilles tendinitis. A few months later, he developed acute anorexia, abdominal distension secondary to ascites and groin lymphadenopathy. Histology of the lymph node biopsy revealed granulomatous lymphadenitis consistent with tuberculosis (TB) and started on quadruple agent anti-TB treatment. The sample was not cultured. He developed constant ooze from his groin lymph node biopsy site and also fluctuance around the Achilles tendon and heel. Pus from the heel stained positive for auramine indicating TB calcaneum with subsequent culture for acid fast bacilli (AFB) confirming diagnosis of TB calcaneum.

BACKGROUND

There have been no other cases of tuberculosis (TB) abscess of the calcaneum/Achilles tendon insertion masquerading as Haglund's deformity reported in the literature. Dhillon,^{1 2} a prolific commentator on skeletal TB, observed that TB of the foot and ankle, leads to diagnostic and therapeutic delays, due to the site being an uncommon focus, coupled with a lack of awareness, and the ability of TB to mimic other disorders both clinically and on radiographs.

TB cases globally are decreasing, but in the UK, the rates are once again increasing and the rise of HIV and the development of multidrug resistant strains of *Mycobacterium tuberculosis* are postulated as causative factors.³

Given the rising rates of TB and the multifactorial propensity for the increased incidence in cities, this case highlights an important differential in the diagnosis of a multitude of seemingly common presentations, including Haglund's deformity and the associated insertional Achilles tendonitis. As observed by other authors, 'a high index of suspicion has to be maintained in high-risk groups like Asian immigrants',¹ and the clinician should be mindful that unlike this patient, concomitant extra-skeletal lesions may not always be present.

CASE PRESENTATION

In December 2009, a 66-year-old Asian man presented to the Foot and Ankle Clinic with a 5 month history of right ankle pain of gradual onset. He had no prior events. He was able to bear weight, but experienced pain behind the ankle on mobilisation. He reports that he had a calcium injection in the recent past in India that had given him 3 weeks of relief. At the first presentation to the UK orthopaedic department, he had swelling around Achilles tendon insertion with a palpable lump which was tender on palpation. Radiograph demonstrated Haglund's deformity and also possible calcification at the attachment of the Achilles tendon (figure 1).

The patient was offered, but declined surgery, and an injection of corticosteroid given at his request.

He was reviewed in a clinic 1 month later, and was discharged as he had symptomatically improved.

In March 2010, he reattended the orthopaedic outpatients with recurring ankle pain. The patient was again offered surgery, but declined. He was counselled for risks and unsuitability of continuing with steroid injections as the mainstay of treatment, but was persistent in his request and a further corticosteroid injection (Kenalog) was reluctantly given. Follow-up was arranged for 3 months. By follow-up in June, he had not improved, but had in fact deteriorated. He was once again advised to have surgical excision of the Haglund's deformity and this time he opted to proceed. His name was added to the waiting list.

Two weeks later, he was admitted under the physicians with acute anorexia and abdominal distension secondary to ascites. He was also noted to have groin lymphadenopathy. He had lymph node biopsy and an ascitic tap was carried out. At that time, he was given a differential diagnosis of lymphoma. The histology results of the lymph node biopsy revealed granulomatous lymphadenitis consistent with TB, but no culture had been obtained.

He was therefore started on quadruple agent anti-TB treatment by the physicians. He was followed-up regularly with the aim of converting to dual agent anti-TB treatment at the 8 weeks mark and completed the course by 6 months. Unfortunately, he developed hepatotoxicity after 1 month and was therefore readmitted to hospital under the physicians to reintroduce anti-TB

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Figure 1 Radiograph at presentation to the orthopaedic department.

treatment due to hepatotoxicity. At this time, his groin lymph node biopsy site was noted to be constantly oozing. The physicians also noted swelling and fluctuation around the Achilles tendon and heel and investigated with plain radiographs and MRI (figure 2).

A subsequent image-guided needle biopsy showed thick pus. The aspirate was sent to the laboratory where it stained positive for auramine indicating TB calcaneum with subsequent culture for acid fast bacilli (AFB) confirming the diagnosis of TB calcaneum.

Considering the complexity of the situation and the presence of a cold abscess at the heel (of unknown duration), we advised immobilisation in an Aircast boot and continuation of anti-TB medication (which had just recommenced). He was advised against surgery at this time. He continued to improve while on anti-TB medication. The 6-month course of treatment was completed in March 2011.

In May 2011, he had a follow-up MRI which demonstrated calcaneal involvement with abscess tracking from the calcaneum pointing superficial to the Achilles tendon and little improvement.

At orthopaedic review in May, the abscess had self-drained and formed an ulcer. This was confirmed by ultrasound. In the intervening 1 week between MRI and orthopaedic review, he had been seen again by the physicians who had recommenced anti-TB treatment for a predicted duration of 12 months.

By November 2011, he had an occasional pain approximately at tendo-Achilles region, but no ankle pain. He could walk without much discomfort. There was no tenderness over the calcaneum or tendo-Achilles and he had a good range of movements at the ankle. Clinically, the ulcer was improving, but was still not healed. There was no distal neurovascular deficit. Radiographs demonstrated some resolution of calcaneal lesion in comparison to earlier films.

In February of 2012, the patient had been on anti-TB treatment for 8 months. The wound over Achilles tendon had almost completely healed and an ultrasound done revealed the tendon to be 'absolutely normal'. New bone formation was noted over

calcaneum. The latest MRI (July 2012) (figure 3) revealed complete resolution and healing with no residual abscess.

This patient has completed a total course of 18 months of antituberculous chemotherapy (6 months then a further 12 months).

It is our belief that his heel pain was secondary to early developing TB, and that the Haglund's Deformity is an incidental finding. We therefore have no plans to surgically resect the prominence and should heel pain recur, we plan to repeat MRI to ensure no re-emergence of the mycobacterium.

INVESTIGATIONS

Radiograph of foot and ankle demonstrated Haglund's deformity and also the possible calcification at the attachment of the Achilles Tendon (figure 1).

Lymph node biopsy—histology results of the lymph node biopsy revealed granulomatous lymphadenitis consistent with TB.

Asцитis tap—not sent for culture at that time as the differential diagnosis was thought to be lymphoma.

MRI (figure 2)—to investigate swelling and fluctuation around the Achilles tendon and heel.

Image-guided needle biopsy showed thick pus. The aspirate was sent to the laboratory where it stained positive for auramine indicating TB calcaneum with subsequent culture for AFB confirming the diagnosis of TB calcaneum.

Follow-up MRI which demonstrated calcaneal involvement with abscess tracking from the calcaneum pointing superficial to the Achilles tendon and little improvement.

The abscess had self-drained and formed an ulcer—confirmed by ultrasound.

The wound over Achilles tendon had almost completely healed. Ultrasound revealed the tendon to be 'absolutely normal'.

Plain radiograph—new bone formation was noted over calcaneum.

A repeat MRI (July 2012) (figure 3) revealed complete resolution and healing with no residual abscess.

Figure 2 (A) Radiograph of right foot showing calcaneal destruction, (B) T1 sequence MRI demonstrating calcaneal involvement and (C) T2 sequence MRI demonstrating calcaneal involvement.

DIFFERENTIAL DIAGNOSIS

- Haglund's deformity and insertional Achilles tendinopathy
- Lymphoma

TREATMENT

Quadruple agent anti-TB treatment.

OUTCOME AND FOLLOW-UP

This patient has completed a total course of 18 months of anti-tuberculous chemotherapy (6 months then a further 12 months).

In February 2012, the patient had been on anti-TB treatment for 8 months. The wound over Achilles tendon had almost completely healed and an ultrasound carried out revealed the tendon to be 'absolutely normal'. New bone formation was noted over calcaneum. The latest MRI (July 2012) (figure 3) revealed complete resolution and healing with no residual abscess. Clinically, his skin had healed and showed no evidence of residual sinus (figure 4).

DISCUSSION

The eponymous Haglund's deformity, first described in 1928 by Patrick Haglund,⁴ a Swedish Orthopaedic Surgeon, is a chronic enlargement of the posterior-superior prominence of the calcaneum.⁵ It is a normal anatomical variant often referred to as the 'pump bump' as the prominence can become irritated especially by footwear with rigid backs such as pumps leading to insertional Achilles tendinitis. Achilles tendinitis described by Clain

and Baxter⁶ as an overuse phenomenon⁷ occurs when the bursa between the calcaneum and the Achilles tendon (formed by the union of the tendon of the soleus and gastrocnemius muscles) becomes inflamed causing heel pain, degeneration of the Achilles tendon insertion and tenderness on palpation. Achilles tendinitis is common with a reported incidence in the USA somewhere in the region of 6.5–18% in runners, though the actual incidence is unknown.⁸ The presence of a Haglund's deformity is not pathognomonic of insertional Achilles tendinitis as illustrated by a retrospective study by Kang *et al*,⁷ who found Haglund's deformity was equally present in asymptomatic patients.

TB is caused by bacteria (*M tuberculosis*) and despite being both curable and preventable is second only to HIV/AIDS as the single greatest infectious agent leading to death.^{9 10} Though it most commonly affects the lungs, it can also be found extrapulmonarily. The WHO declared TB a global emergency in 1993. The UK has an estimated 13/100 000 cases per population with most cases occurring in major cities, particularly in London equating to around 9000 cases and approximately 40% of them reportedly diagnosed in London. These figures appear quite low when compared to the African, Western Pacific and South East Asian Populations, but have resulted in Britain being the only nation in Western Europe with rising levels.

There have been no other cases of TB abscess of the calcaneum/Achilles tendon insertion masquerading as Haglund's deformity reported in the literature.

Figure 3 (A and B) T1-weighted MRI demonstrating resolution and healing of abscess over calcaneum.

Routine surgical resection of the deformity is an acceptable treatment favoured by many surgeons including the senior author.^{7 11 12} Treatment of Achilles tendinitis with local injection of steroid is an acceptable modality though there is a lack of high-level evidence to support it.^{13 14}

Extrapulmonary TB is reported to account for 1–3% of all TB.^{15–18}

TB of the foot and ankle is rare,^{1 2 19} and in the absence of HIV, its frequency decreases further.

In a retrospective series by Chen *et al*,²⁰ ankle TB accounted for 0.24% of all cases of TB during a 20-year study period.

Figure 4 (A and B) Photographs of the affected heel at final follow-up shows no evidence of residual sinus.

Calcaneal TB is rare and cases in the literature are scarce with reports seldom originating from the UK.

Dhillon,^{1 2} a prolific commentator on skeletal TB, observed that TB of the foot and ankle leads to diagnostic and therapeutic delays, due to the site being an uncommon focus, coupled with a lack of awareness, and the ability of TB to mimic other disorders both clinically and on radiographs. He also recommends medical treatment of such infections, advising surgical treatment to be reserved for those cases of 'intractable disease or as a salvage procedure for patients with deformed hindfoot joints'.

The patient was offered surgery to resect the Haglund's deformity, but on two occasions requested and received steroid injection before considering operative treatment. This is the first case to our knowledge of TB abscess of the Achilles tendon insertion heralding the disease. It is not known whether the patient had dormant TB that was activated by the corticosteroid injection, though the locus of infection developed 6 months after the injection of (KENOLOG). We believe that his symptoms of heel pain and tenderness on initial presentation to the department were in fact the first manifestation of his extrapulmonary TB.

Medical management of a tuberculous cold is an acceptable strategy in the first instance, with formal incision and drainage being reserved for complicated, non-responsive or specific sites

of abscess. On this occasion, the lesion healed without surgical intervention. The calcaneum is notoriously difficult to heal and frequently succumbs to delayed healing or secondary infections.

TB cases globally are decreasing, but in the UK, the rates are once again increasing and the rise of HIV and the development of multidrug resistant strains of *M tuberculosis* are postulated as causative factors.³ Figures from the WHO Global Tuberculosis report 2012²¹ show identify relapse notification rates for UK and Northern Ireland are once again rising (figure 5).

Globally, in 2011, there were an estimated 8.7 million new cases (of which 13% represent coinfections with HIV) and 1.4 million deaths from TB with approximately 1 million deaths among HIV-negative individuals.

Cooper *et al*³ also identify the rise of increasingly atypical presentations. Mittal *et al*¹⁶ suggest that TB should be suspected in all cases of long-standing foot pain, while Dhillon *et al*¹ warn that it should be suspected in high-risk groups, such as Asian immigrants.

It has been suggested that patients with bone or joint TB should be treated for minimum 9 months of antituberculous drugs, reserving surgery only for those lesions that fail to heal after adequate chemotherapy¹⁶ and some authors advocating 12–18 months of treatment.²² This patient received a total of 18 months treatment. His symptoms recurred after the first course of 6 months, but have shown both clinical and radiographical evidence of resolution after a further 12 month course.

Extrapulmonary TB is more common in HIV-positive patients, but this patient was not HIV positive and had not been diagnosed with TB in the past. We believe that his symptoms of heel pain and tenderness on initial presentation to the department were in fact the first manifestation of his extrapulmonary TB. Calcaneal TB is rare and cases in the literature are scarce with reports seldom originating from the UK. Furthermore, this case serves as an aide-memoire to clinicians of all specialties, that the initial clues to the diagnosis of TB infection may be extrapulmonary manifestations.

Given the rising rates of TB and the multifactorial propensity for the increased incidence in cities, this case highlights an important differential in the diagnosis of a multitude of seemingly common presentations, including Haglund's deformity and associated insertional Achilles tendonitis. As observed by other authors, 'a high index of suspicion has to be maintained in high-risk groups like Asian immigrants'¹ and the clinician should be mindful that unlike this patient, concomitant extra-skeletal lesions may not always be present.

Multidrug antituberculous chemotherapy (for 12/18 months) is the mainstay of the treatment.²² As illustrated by this case, the calcaneal lesion fully resolved without surgical intervention after an appropriate duration of medical treatment. In all cases, medical treatment should be the first line of treatment and should continue for a prolonged period.

Figure 5 New and relapse notification rates for UK and Northern Ireland taken from WHO Global Tuberculosis Report 2012.²¹

Learning points

- ▶ Extrapulmonary TB is more common in HIV-positive patients, but this patient was not HIV positive and had not been diagnosed with tuberculosis (TB) in the past.
- ▶ Calcaneal TB is rare and cases in the literature are scarce with reports seldom originating from the UK. Furthermore, this case serves as an aide-memoire to clinicians of all specialties, that the initial clues to the diagnosis of TB infection may be extrapulmonary manifestations.
- ▶ Unlike this patient, concomitant extraskeletal lesions may not always be present.
- ▶ In all cases, medical treatment (multidrug antituberculous chemotherapy) should be the first line of treatment, and should continue for a prolonged period (12 to 18 months).

Contributors EG has written the case report. PR supervised and edited the case report.

Competing interests None.

Patient consent Obtained.

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