CASE REPORT

Unusually massive ulnar nerve abscess in a leprosy patient; a diagnostic and therapeutic challenge

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Summary  An 18 year old male on multibacillary multidrug therapy (MBMDT) for 7 months with the diagnosis of borderline tuberculoid (BT) leprosy, presented with gradually progressive and massive right ulnar nerve abscess and radial cutaneous nerve abscess. He also had mobile complete claw hand of the right side. High resolution ultrasonography (HR USG) of the right ulnar nerve showed markedly thickened ulnar nerve with loss of normal fascicular pattern. It also showed heteroechoic collection, with central anechoic lesion suggestive of ulnar abscess, measuring about 145cc in volume. In addition to MBMDT, the patient was started on tapering oral prednisolone starting 40 mg daily. The ulnar nerve abscess was decompressed by percutaneous aspiration on three occasions every 3–4 weeks. Serial HR USG of nerves was carried out throughout the treatment period. No surgical intervention was required. After 24 months of MBMDT, complete resolution of nerve abscess with improvement in right ulnar nerve motor function was noted. The patient underwent corrective surgery for right claw hand.

Introduction

Leprosy is a chronic infectious disease that chiefly affects the skin and peripheral nerves. Based on the immunity of the patients, disease can be classified to be on tuberculoid or lepromatous pole. All through the clinical spectrum, patient may display reactional states, which may be associated with neuritis. Nerve abscess is an infrequent complication, usually associated with Type 1 reaction mostly in tuberculoid and borderline tuberculoid disease that can lead to irreversible nerve damage and deformities. It is therefore important to treat nerve
abscesses promptly and appropriately by the medical or surgical modalities. We hereby report a young man with unusually massive ulnar nerve abscess that was treated successfully with percutaneous drainage and oral steroid with complete avoidance of surgical intervention.

**Case Report**

An 18 year old Indian male was clinically diagnosed to have leprosy at a primary health centre, on the basis of an anaesthetic hypopigmented skin patch on the dorsum of his right hand and was prescribed anti-leprosy treatment (ALT) with multibacillary multidrug therapy (MBMDT). About 2 months later, he developed a gradually progressive painful swelling around the right elbow. Thereafter, he noticed second swelling on the outer aspect of the right wrist. These swellings kept growing in size over the next 5 months and the patient sought advice in our leprosy clinic. He complained of shooting pains along the ulnar aspect of his right hand. He manifested difficulty in making a fist and decreased hand grip on the right side. Examination revealed a single anesthetic, hypopigmented lesion on the dorsum of his right hand. In addition, he had two tender fluctuant swellings; the larger one measuring 12 cm × 10 cm overlying the posteromedial aspect of the lower one third of the right arm (Figure 1a) and another of 3 cm × 2 cm size on the lateral aspect of right wrist (Figure 1b).

He also had mobile complete claw hand of the right side (Figure 1c) which showed a power of 1/5. A sensory loss > 80% was documented in the ulnar and radial nerve distribution of the right hand. A provisional diagnosis of borderline tuberculoid (BT) leprosy with right sided ulnar and radial cutaneous nerve abscesses with right sided mobile ulnar and median claw hand was made. The clinical diagnosis was confirmed on skin biopsy that showed features of BT Hansen. Slit skin smear examination did not yield any acid-fast bacilli. High resolution ultrasonography (HR USG) showed thickened right sided ulnar nerve and radial

**Figure 1a–c.** (a) Ulnar nerve abscess on the posteromedial aspect of right elbow, (b) Right radial cutaneous nerve abscess (3 × 2 cm), (c) Right complete claw hand.
Figure 2. Radial nerve measuring 42.72 sq mm in cross section, with loss of fascicular pattern.

Figure 3a–b. (a) Increased perineural echogenicity and large heteroechoic collection in ulnar nerve suggestive of abscess. (b) Abscess size calculated to approximately 142 ml.
nerve measuring 71.4 sq mm and 42.72 sq mm (Figure 2) respectively with loss of the fascicular pattern.

Ulnar nerve swelling showed increased perineural echogenicity and large heteroechoic collection suggestive of abscess, with 145 ml volume approximately (Figure 3a–b).

Figure 4. USG doppler showing increased perineural and intraneural vascularity.

Figure 5a–b. (a) Per cutaneous, anti-gravity aspiration of straw coloured fluid using a wide-bored needle. (b) Three sessions of aspirations (72 ml + 45 ml + 25 ml).
The USG Doppler showed increased perineural and intraneural vascularity suggesting inflammatory process (Figure 4).

The patient was continued on MBMDT and oral prednisolone in the dose of 1 mg/kg body weight was added. The ulnar nerve abscess was decompressed by antigravity percutaneous aspiration, using a wide-bored 21 Gauge needle that yielded 72 ml of straw coloured free flowing fluid in the first session (Figure 5a).

This fluid was negative for *Mycobacterium leprae* and *Mycobacterium tuberculosis* on PCR. Post aspiration HR USG showed shrinkage in the size of abscess with minimal residual hyperechoic shadow, suggestive of debris (Figure 6).

![Figure 6](image)

**Figure 6.** Post aspiration, thickened right ulnar nerve with loss of the fascicular pattern, measuring 71.4 sq mm, with shrinkage of abscess cavity.

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![Figure 7a-d](image)

**Figure 7a–d.** (a & b) Longitudinal section of ulnar nerve showing decrease in abscess fluid, minimal residual debris and loss of fascicular pattern. (c) Near compete subsidence in abscess fluid. (d) Post treatment USG- Thickened ulnar nerve with complete clearance of abscess.
This aspiration was carried out on three occasions at an interval of about 10–14 days. A total of 142 ml of fluid was aspirated (Figure 5b). Following 3rd aspiration, triamcinolone acetonide (20 mg/ml) was injected perineurally. USG of nerves was carried out serially during the follow up which showed decrease in size of abscesses (Figure 7a–d).

Prednisolone was tapered by 5–10 mg at 4 weekly intervals and physiotherapy was advised. No surgical intervention was required. The patient received 24 kits of MBMDT with complete resolution of nerve abscess as supplemented by HR USG (Figure 7d) and power of 3/5 in muscles supplied by the right ulnar nerve (Figure 8a–c).

The patient has undergone reconstruction surgery for his right claw hand.

Discussion

Despite elimination of leprosy from India in December 2005, it continues to be a significant health menace until the present date. India is responsible for highest disease burden for leprosy worldwide.1 Nerve abscess is a known but infrequent complication of leprosy, mainly seen in tuberculoid or borderline tuberculoid leprosy due to the active immune status against M. leprae that restricts the disease to a few skin lesions or peripheral nerves. There is a T-cell orchestrated destruction of perineurium of a peripheral nerve along with damage to Schwann cells and axons.2 At times, severe inflammatory changes results in liquefaction of the granuloma and caseous necrosis. Multiple caseating lesions within the nerve may coalesce to form a nerve abscess.3

The most common nerve involved is the ulnar, followed by other cutaneous nerves of the upper and lower limbs, peroneal nerves and median nerve. A rare case of leprous nerve abscess in the greater auricular nerve has also been reported.4 To avoid nerve compression and palsies, immediate decompression is essential. A case series conducted on 19 patients with nerve abscess secondary to leprosy used evacuation and drainage with medial
longitudinal epineurotomy for ulnar nerve decompression.\textsuperscript{5} In another report, an 11 year old boy presented with ulnar nerve abscess as a manifestation of mono-neuritic Hansen, diagnosed on USG. After failing to respond to steroid therapy, he was treated surgically by the exploration of the ulnar nerve abscess and drainage.\textsuperscript{6} Multiple nerve abscesses have been reported in pure neuritic leprosy and borderline leprosy treated surgically along with oral steroids and PBMDT.\textsuperscript{3,7} In our patient we have successfully achieved decompression by HR USG guided percutaneous aspirations, hence completely avoiding the hazards of surgical intervention.

Ultrasonography has been found to be a useful tool in the assessment of ulnar nerve enlargement and/or morphologic alterations associated with leprosy, though the literature is limited to individual case reports and few case series.\textsuperscript{5–9} In a cross sectional case controlled study, we evaluated 96 ulnar nerves on sonography in 48 Indian patients of leprosy. We found statistically significant increase in the diameter of ulnar nerve (asymmetrical nerve thickening), fascicular abnormalities and focal or diffuse nerve hypo- or hyperechogenicity. Evidence of reaction was observed as neural vascularity on colour Doppler imaging.\textsuperscript{8} HR USG of our patient revealed heteroechoic collection, with central anechoic lesion suggestive of abscess fluid and peripheral hyperechoic shadow suggestive of the debris or organising pus. Serial USG following every percutaneous aspiration was extremely helpful in assessing the therapeutic response and helped in tapering steroids too. Thus ultrasound can be a useful tool for follow-up of nerve pathology in leprosy patients. It can help in differentiating neuritis and early stages of nerve abscess. Sen et al. also concluded that high resolution USG is better diagnostic modality than MRI for evaluating abscess in leprosy and has better cost-effectiveness than MRI.\textsuperscript{10} This case is being reported for the unusually large size of the ulnar nerve abscess and its successful treatment without surgical intervention.

References