

Ultrasonography of Ulnar nerve abscess in leprosy: A report of two cases.

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ABSTRACT Nerve abscess is an important complication of type-1 reaction in leprosy, requiring immediate management. We report two cases of ulnar nerve abscess in patients diagnosed with Type-1 leprosy reversal reaction. Ultrasound provides objective evaluation of neural changes during reactions. Increased cross sectional area and morphological alterations occur in afflicted nerves. Additional features noted during abscess formation include breach in perineurium with anechoic collection either in the course or adjacent to involved nerve.

Key words: Ulnar Nerve, abscess, ultrasonography, leprosy Introduction

Introduction

Leprosy is a chronic infectious disease caused by *Mycobacterium leprae* [1]. Though it is a disease of low infectivity, approximately 10 million people are affected worldwide, mostly in the developing countries of Asia, Africa and Latin America [2]. Leprosy has a wide clinicopathological spectrum depending on the immune status of the patient and it primarily affects the skin and the peripheral nervous system. Due to the affinity of *Mycobacterium leprae* for peripheral nerves, neuropathy is a cardinal feature of leprosy. Nerves that are predominantly involved include ulnar nerve, median nerve, lateral popliteal nerve, posterior tibial and greater auricular nerve. Nerve abscess is a relatively uncommon complication and it can be easily confused with the more common type-1 reaction. We herein report the usefulness of ultrasonography in differential diagnosis.

Case Report

We report two male patients, 25 and 37 years old respectively, who presented with focal swelling above the medial epicondyle. One of them also had motor and

sensory symptoms of ulnar nerve such as ulnar claw hand and forearm paresthesia; he had been on anti-leprosy treatment for the past 1 month. The second patient had paresthesia with skin patch on the dorsum of hand and he was on treatment for 15 days. Both of them were clinically diagnosed to have type-1 reaction. High resolution real-time sonographic examination of both ulnar nerves was done using HDI 5000 scanner (Philips) equipped with a phased array broadband 5-12 MHz linear transducer to evaluate changes related to leprosy neuropathy. Detailed grey scale and Doppler evaluation of the focal swelling was also done.

The involved ulnar nerve showed non visualization of fascicular pattern with focal hyperechoic areas in case one (Fig. 1). Transverse view showed breach in the perineurium of nerve with anechoic collection suggestive of abscess formation above elbow (Fig. 2 and 3). Similar collection was visualized in the second patient with presence of moving echoes within. Color Doppler evaluation showed increased endoneural and perineural vascularity in the second patient. (Fig 4)

Discussion

Nerve deficit may be precipitated during episodic exacerbations (reactions) in 15-50% of patients during the course of leprosy or after the completion of multidrug therapy. These exacerbations are of 2 types: Type-1 reversal reaction where only the skin patch shows inflammation with tenderness in the associated nerve; and Type 2 reactions which manifesting with systemic

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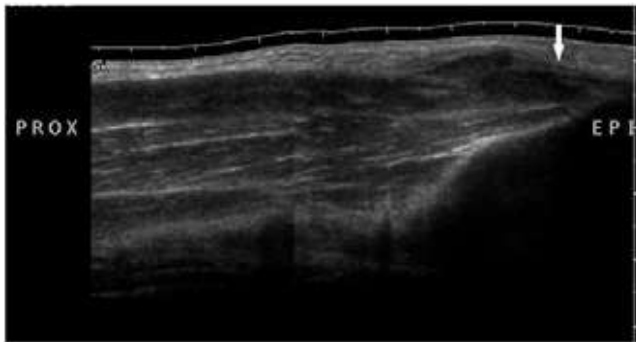


Fig 1: Panoramic view showing diffuse thickening of ulnar nerve with disrupted fascicular pattern, focal hyperechoic areas and abscess formation along its distal end (arrow).

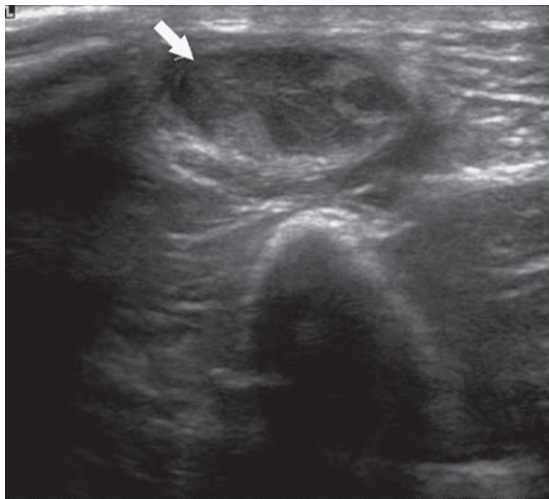


Fig 2: Transverse view showing breach in the perineurium of thickened nerve with hypoechoic areas suggestive of abscess formation (arrow).

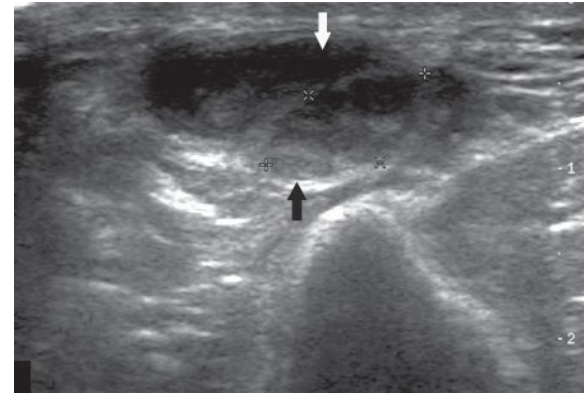


Fig 3: Transverse view shows well defined anechoic lesion (white arrow) with dependant hypoechoic debris suggestive of abscess formation adjacent to a thickened pathological nerve (black arrow)

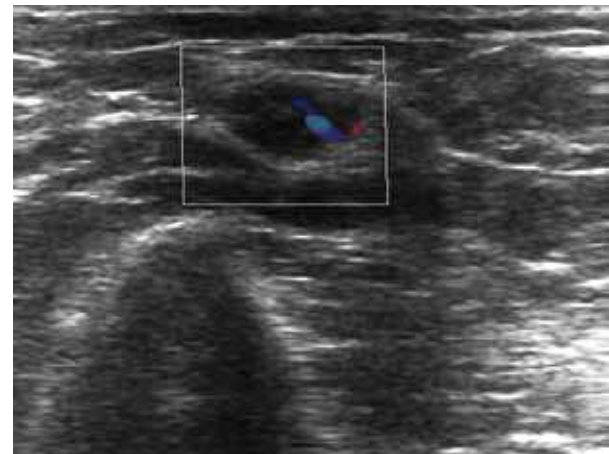


Figure 4: Color Doppler image showing increased endoneural and perineural vascularity (patient-2).

symptoms of fever, erythematous nodules and joint pains [3]. In type-1 reaction the inflamed skin lesion lies close to the affected nerve or situated over the area innervated by the corresponding nerve. Rapid swelling of one or more affected peripheral nerves with severe pain and tenderness at the site of swelling or along the course of the nerves is the common clinical finding. In severe form of type-1 reaction nerve abscess may be formed.

Ulnar nerve is the commonest nerve to develop abscesses. A nerve abscess develops in approximately 1.3 per cent of leprosy patients in India and some of these may even get calcified. The incidence of nerve abscesses in leprosy has been rising and this is attributable to absence of necessary infrastructure to detect and treat early neuritis. Young children and adolescents account for the majority of cases. [4] Nerve damage may occur in type-2 reaction, but not as quickly as it occurs in type-1 reaction. Inflammatory edema of the reaction and cellular exudates in the perineurium increase the intra-neural pressure; Figure 4: Color Doppler image showing increased

endoneural and perineural vascularity (patient-2). resultant compression of the vasa nervosum and nerve fibres, results in precipitation of acute symptoms. Presence and the degree of nerve involvement in patients with leprosy are usually evaluated by clinical assessment and at times by immunohistochemical techniques, nerve conduction studies and rarely nerve biopsy. Nerve conduction studies are useful in quantifying the sensory and motor deficit but are not done commonly because of limited availability, increased cost, patient discomfort and inability to pin-point specific etiology. Nerve biopsy is usually restricted to Pure Neuritic Hansen. However, due to the risk of worsening the neurological deficit biopsy cannot be performed on nerves having a motor component, as it is the case of the ulnar nerve [5]. The superficial location of the nerves involved in leprosy facilitates their evaluation by high resolution ultrasound, especially the ulnar nerve.

Careful evaluation of affected nerves is essential to detect recent deterioration in their function (sensory, motor and

autonomic functions) during and after each episode of reaction. However, skin involvement may not always be associated with the manifested nerve lesions. The nerve involvement by leprosy reactions is reversible, if recognized and promptly treated with steroids and nerve decompression. Ultrasonography can be used to study structural changes in thickened nerves also and abscess formation, which cannot be biopsied for histopathology. Ultrasonography also facilitates studying of the suspected nerve for a longer length in both static and dynamic state.

Conclusion

High prevalence of leprosy requires an accessible and affordable modality like ultrasound for differential diagnosis of nerve related complications such as type-1 reaction and abscess formation. Grey scale and color Doppler ultrasonography appears to be a useful tool. It helps in identifying patients who may benefit by surgical drainage of abscess and decompression of affected nerve thereby resulting in higher probability of cure.

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