# Nerve abscess in leprosy: a retrospective study

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*Summary* Nerve abscesses occur, both in tuberculoid and lepromatous leprosy. We studied 20 patients who had undergone surgery for nerve abscess in mixed peripheral and cutaneous nerves. Details of these cases and the controversial question as to how long the question PB regimen should be continued are discussed.

#### Introduction

Leprosy is a disease of the skin and nerves, and the involvement of both peripheral and cutaneous nerves is often found in leprosy. Schwann cells act as a reservoir of *Mycobacterium leprae*. The pathology is different in tuberculoid and lepromatous leprosy. In tuberculoid leprosy there is a cell-mediated immunological reaction that causes a granuloma formation which in some cases may liquify and develop into an abscess. In lepromatous leprosy abscesses may be due to an antigen–antibody reaction, e.g. an ENL reaction, exacerbation of lepromatous lesion, necrosis of lepromatous granuloma or, perhaps, an iatrogenic reaction as a complication of perineural or intraneural injection.<sup>1</sup> Multiple nerve abscesses are common in cases of lepromatous leprosy.

### Material and methods

Between January 1987 and December 1990, we carried out a decompression of the nerves of 490 patients who were suffering from early paralysis, painful neuritis and nerve abscesses. (Of these, 20 patients underwent surgery for nerve abscess.) These cases were analysed for the type of leprosy, the duration of the disease, the duration of treatment, which nerve was involved, their bacteriological index, and the assessment of sensory and motor paralysis. After the surgical evacuation of pus and the decompression of nerve, the

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pus was stained for AFB, culture, and sensitivity for pathogens was also carried out. Epineurium, along with caseation and some nerve tissue, was sent for histopathological examinations. We carried out a periodic assessment on any recovery of motor and sensory function.

The surgery involved epineurotomy and the evacuation of abscess from all nerves. Medical epicondylectomy was performed in the cases of ulnar nerve abscess and a carpal tunnel decompression for median nerve lesions.

#### **Observation and analysis**

In all, 20 patients, whose average age was 21·3 years (range 9–55 years) underwent an evacuation of nerve abscesses—18 were male and 2 female. The patients had on average suffered for 1·8 years (minimum 2 months, maximum 6 years); 18 had already been on a specific treatment for between 1 month and 2 years—7 were tuberculoid, 11 BT, 1 BL, and 1 LL. The skin smear was positive in only 2 cases, while the abscess material on staining showed AFB in 7 cases (including the 2 cases above). The nerves involved were 17 ulnar, 5 median, 1 lateral popliteal, the others being cutaneous nerves. The duration of abscess varied from 1 to 6 months. Culture and sensitivity of the abscess material did not reveal any pathogenic organisms. All the trunk nerves involved had some functional deficit.

#### **OPERATIVE FINDINGS**

In cases of tuberculoid and BT leprosy the pus was thick, the nerve bundles were swollen, and some were granulomatous. There was multiple nerve involvement in BL and LL cases, and the pus was thin. Tiny abscesses were found in many nerve bundles. The epineurium was thick and adhered to surrounding tissues and perineurium. It was difficult to separate the epineurium from nerve bundles.

#### Discussion

Nerve abscess is often seen in leprosy (Figures 1 and 2). It is more common in the tuberculoid spectrum, especially in borderline tuberculoid cases, probably due to some exaggerated delayed hypersensitivity reactions. In all, 18 patients developed nerve abscess after MDT or DDS monotherapy. Any reactions and relapses that occur during or after treatment can result in nerve damage.<sup>8,9,10</sup> Katoch *et al.*<sup>9</sup> reported a late reaction in 9% and a relapse in 13% of their cases. Pavitran<sup>10</sup> has also reported relapses after PB regimen (12%).

Even though nerve abscess is rarely seen in the lepromatous spectrum of the disease, many have reported nerve abscess in lepromatous leprosy. In the 2 cases reported here, both ulnar and median nerves were involved on both sides. The patients had an acute exacerbation of ENL reactions, after which they developed pain, tenderness and swelling in the nerves. The pus was thin and contained AFB and pus cells. A skin smear of the patients was positive and their BI was  $2\cdot 3$  and  $1\cdot 5$ . Abscess formation was caused by an acute exacerbation of ENL lesion in the nerves.

In 5 of 11 BT cases the pus was bacteriologically positive for AFB (1 +). The skin

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Figure 1. Photograph of an abscess in a lateral popliteal nerve.

smear was negative and skin biopsy from the patch showed a typical borderline tuberculoid type of leprosy with epithelioid cells, some lymphocytes, but no AFB were seen. Therefore, there was a discrepancy in the bacillary content of the nerve and the skin. Palande,<sup>11</sup> Sreenivasan *et al.*<sup>1</sup> and Periera *et al.*<sup>12</sup> have reported a discrepancy of bacterial presence in the skin and nerve lesions.

Periera *et al.*<sup>12</sup> carried out some electron-microscopic studies on treated BT cases and revealed the presence of bacilli and the proliferation of Schwann cells—some were solid bacilli. Pavitran<sup>10</sup> reported a relapse rate of 12% (3/25) after a PB regimen. Kar<sup>13</sup> reported that 35% were clinically active, and 47% histologically active after 6 months of MDT in paucibacillary leprosy. Katoch *et al.*<sup>9</sup> reported that 13% relapsed in paucibacillary cases after MDT. He also reported that the relapse rate fell in cases where the treatment was continued for more than 6 months. This calls attention to the controversial question of insufficient PB regimen in some BT cases. They have to receive treatment for more than 6 months or be treated as MB cases (WHO regimen). This question needs further evaluation and investigation.

Calcification can occur in caseation and necrotic material in tuberculoid and borderline tuberculoid leprosy, as a result of deposition of calcium in the dying, dead and chronically inflamed tissues. Malaviya *et al.*<sup>14</sup> reported 3 cases of calcification in nerves. Ramanujam *et al.*,<sup>15</sup> Jopling<sup>16</sup> and Ellis,<sup>17</sup> reported some calcification in the nerves. In the majority of the reports, the ulnar was the most commonly affected nerve. White chalky



Figure 2. Photograph of an abscess which has been opened. Pus and granulation is seen.

material was found on exploration of the nerves. In our series the ulnar nerve that was thickened and painful was found to contain inspissated pus, chalky material and also a calcified stone, which was removed.

### Conclusion

We found 29 nerve abscesses in 20 leprosy patients. Abscess was found in more than 1 nerve in 2 cases of lepromatous and in 3 cases of borderline tuberculoid leprosy. There was a discrepancy in the bacteriological index of the skin and nerve in 5 borderline tuberculoid cases of 11. This highlights the controversial question as to whether to continue the PB regimen for more than 6 months or whether the patients should receive treatment as MB cases (WHO regimen) to prevent any relapses. Calcification of the nerve was seen in 1 borderline tuberculoid leprosy patient, from whom a calcified stone was removed.

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### Les abcès nerveux dans la lèpre: une étude rétrospective

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*Résumé* Les abcès nerveux ont lieu dans la lèpre tant sous sa forme tuberculoïde que lépromateuse. 20 sujets ont subi une intervention chirurgicale pour abcès nerveux des nerfs périphériques et cutanés mixtes. Nous décrivons ces cas et parlons de la question discutable de la durée du régime thérapeutique PB.

#### Abscesos nerviosos en la lepra: un estudio retrospectivo

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*Resumen* No hay duda de que se producen abscesos nerviosos en la enfermedad de Hansens, tanto en la lepra tuberculoide como en la lepromatosa. Veinte pacientes fueron intervenidos quirúrgicamente debido a abscesos nerviosos en nervios periféricos mixtos y cutáneos. Se discuten los detalles de estos casos y la cuestión debatible de la duración del régimen PB.