Leprotic Involvement of Multiple Peripheral Nerves in the Absence of Skin Lesions

(A case report)

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In 1957 a four-year-old full-blood male aboriginal of the Gunuinggu Tribe from the Liverpool River in Central Arnhem Land, Northern Australia, was diagnosed as having leprosy. His only clinical signs were a considerably enlarged left ulnar nerve, associated with slight wasting of the small muscles of the left hand. Neither then nor later were any skin lesions apparent.

Treatment with diaminodiphenylsulphone was commenced on an outpatient basis. His parents, who belong to a primitive group of tribesmen, fearing the child might be isolated at the leprosarium took him away from the treatment centre and interrupted his treatment. In the vast, undeveloped tracts of Arnhem Land it is comparatively easy to escape surveillance and this child was not seen again for two years.

In 1959, when next seen, it was found that, in addition to the original signs, his left lateral popliteal nerve was enlarged and firm. A further attempt at outpatient treatment met with the same fate as the first. He was next seen in September, 1960. Although his signs were unchanged, he was admitted to the leprosarium to ensure continuity of treatment and observation.

As an inpatient at the leprosarium, despite regular treatment with diaminodiphenylsulphone, he remained a thin, under-developed child, weight gain was slow (7 pounds in 2½ years) and there was progressive involvement of the peripheral nerves.

By July 1961 both ulnar nerves and the left lateral popliteal nerve were grossly enlarged. In March 1962 the right lateral popliteal nerve was also moderately enlarged and both median nerves were readily palpable above the wrist.

In March 1963, another detailed examination was made for neural involvement. The results of this were thought to be unusual and interesting and are set out opposite.

NECK AND TRUNK

Both Great Auricular Nerves were palpable but normal.
The lateral branch of the right supraclavicular nerve was enlarged for a distance of 2 cm. over the lateral third of the clavicle.

UPPER LIMBS

Right

Ulnar Nerve
Grossly enlarged for 12 cm. above the elbow.

Median Nerve
Grossly enlarged for 7 cm. above the carpal tunnel and also 5 cm. above the elbow in the mid-arm.

Radial Nerve
Grossly enlarged for 5 cm. above the elbow.

Dorsal Branch of Ulnar Nerve
Enlarged and hard.

Terminal Branch of Radial Nerve
Grossly enlarged for 14 cm. above the wrist.

Lateral Antebrachial Cutaneous Nerve
Enlarged for 12 cm. below the elbow.

Medial Antebrachial Cutaneous Nerve
Enlarged for 5 cm. below the elbow.

Posterior Antebrachial Cutaneous Nerve
Enlarged, hard and nodular for 9 cm. below the elbow.

Left

Ulnar Nerve
Grossly enlarged for 12 cm. above the elbow but palpable up to the axilla.

Median Nerve
Grossly enlarged for 4 cm. above the carpal tunnel.

Radial Nerve
Grossly enlarged for 6 cm. above the elbow.

Dorsal Branch of Ulnar Nerve
Not palpable.

Terminal Branch of Radial Nerve
Enlarged for 6 cm. above the wrist.

Lateral Antebrachial Cutaneous Nerve
Enlarged for 12 cm. below the elbow.

Medial Antebrachial Cutaneous Nerve
Enlarged for 5 cm. below the elbow.

Posterior Antebrachial Cutaneous Nerve
Palpable before reaching the forearm from mid-arm to elbow.

LOWER LIMBS

Right

Lateral Popliteal Nerve
Grossly enlarged for 5 cm. about the neck of the fibula.

Posterial Tibial Nerve
Grossly enlarged behind the medial malleolus and greater in size than on the left.

Musculocutaneous Nerve
Grossly enlarged in the lower third of the leg to the level of the ankle joint.

Sural Nerve
Enlarged in the lower three-quarters of the calf.

Infrapatellar Nerve
Palpable for a distance of 5 cm.

Lateral Cutaneous Nerve of the Thigh
Palpably enlarged in the middle third of the thigh.

Medial Femoral Cutaneous Nerve
Not palpable.

Lateral Cutaneous Nerve of Calf
Palpable just medial to the lateral popliteal nerve behind the knee.

Left

Lateral Popliteal Nerve
Grossly enlarged for 4 cm. about the head and neck of the fibula.

Posterior Tibial Nerve
Enlarged behind the medial malleolus.

Musculocutaneous Nerve
Enlarged for same distance as the right but smaller in size.

Sural Nerve
Grossly enlarged in the lower half of the calf.

Infrapatellar Nerve
Not palpable.

Lateral Cutaneous Nerve of the Thigh
Not palpable.

Medial Femoral Cutaneous Nerve
Palpably enlarged for a distance of 3 cm. at about 10 cm. above the knee.

Lateral Cutaneous Nerve of Calf
Not palpable.

X-ray of right hand showing early resorption of tips of thumb, index and middle fingers.

OTHER PHYSICAL FINDINGS

A very thin, ten-year-old aboriginal boy

The Histological report on a section of the terminal branch of the radial nerve was: 'There are collections of inflammatory cells within the nerve. These tend to be focally arranged and consist chiefly of lymphocyte-like cells with some macrophages. This appearance could occur in Leprosy.'

RIGHT UPPER LIMB

There were old scars on the tips of the thumb, index and middle fingers, with early resorption of the terminal phalanges. Wasting in the thenar eminence was obvious but was only slight in the hypothenar eminence.

The following muscles were found to be weakened in action: Flexor pollicis brevis, Abductor pollicis brevis and all the interossei. The Flexor digitorum profundus to the ring and little fingers was weak and the Flexor carpi ulnaris action was almost absent. There was no demonstrable weakness in the action of the lumbricals.

Sensation to pinprick was normal, but sensation to light touch, though present, was dimished and localisation was poor. The language barrier and the age of the patient made the testing of thermal sensation difficult. The thumb, index and middle fingers were dry but the ring and little fingers were moist to the touch.

LEFT UPPER LIMB

The left forearm was very thin and there were some small burn scars over the left olecranon. The thenar and hypothenar eminences were wasted and the 4th and 5th fingers were clawed.

The unassisted angles (Brand 1959) of the proximal interphalangeal joints were:
Index = 44°; Middle = 56°; Ring = 98°; Little = 98°.

The assisted angles were:
Index = 0°; Middle = 0°; Ring = 41°; Little = 56°.

Contractures in these joints were:
Ring = 24°; Little = 34°.

The following muscles were completely paralysed: All the Lumbricals, Flexor carpi ulnaris and Flexor digitorum profundus to the ring and little fingers, and the Adductor pollicis.

The abductor pollicies brevis and the Flexor pollicis brevis were weak.

The Opponens pollicis appeared to be normal in action after passively initiating and aiding abduction. The whole hand was dry and completely anaesthetic except over the lateral side of the volar aspect. Localisation was poor and the precise boundaries of anaesthesia almost impossible to define accurately.

LOWER LIMBS

There was no sensory defect or muscular paralysis in either leg. Sweating appeared to be normal.

Following this detailed examination (March 1963), a course of Prednisone at a dosage level of 5 mgm. t.d.s. was commenced in the hope of reducing the amount of fibrosis in the enlarged nerves. After six months the dose was reduced to 5 mgm. b.d. and has continued at that level.

In October 1963 another detailed examination of the enlarged peripheral nerves showed that all were smaller in size, except the left median nerve, the left lateral popliteal nerve and both posterior tibial nerves. These appeared to be unchanged.

Other physical findings at this latter date remained the same. Weight gain over the same period was five pounds.

DISCUSSION

Palpable enlargement of certain peripheral nerves in leprosy is extremely common (DHARMENDRA 1960 et al). What, in the author's opinion, is unusual is to encounter such a large number of palpably enlarged peripheral nerves simultaneously.

BRAND (1959) has pointed out that freedom of peripheral nerves from involvement depends on their depth from the surface and is, therefore, related to temperature. This patient, being a very thin child with a minimum of superficial fat, may on that account have been more prone to peripheral neural involvement.

The relationship of prednisone therapy to the diminishing size of the nerves is, at best, of dubious significance in an isolated case. It is mentioned only in view of possible subsequent value. It is a matter of common experience that one finds very small, hard nerves with a considerable degree of deformity in the late stages of leprosy. It is, then, quite possible that the diminishing size of these nerves indicates that they are undergoing this process and will, in time, produce this deformity. This will be interesting matter for future observation.

ACKNOWLEDGEMENTS

Our thanks are due to the Director-General of Health, Commonwealth Department of Health, for permission to publish this article. Our thanks are also due to DR. R. WELLS, National Health and Medical Research Council.

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