LEPROSY SECTION

NEUROLOGICAL PATTERNS OF LEPROSY

Leprosy is a disease of the peripheral nerves. Definite diagnosis of 'lepra' can be made only by demonstration of the specific pathology of the nerves, which however varies in different types of the disease. In the tuberculoid type for example, the number of bacilli inside the nerve sheath is small. but due to the violent reaction from the organism an antigen-antibody reaction sets in. Oedema and infiltration with epitheloid cells take place inside the thickened epineurium, with caseous necrosis as the end result. In the lepromatous type however, there is an enormous number of bacilli inside the nerve sheath. The sluggish reaction of the organism sets up a slow and insiduous process producing a perineural granuloma which may lead to strangulation of the nerve fibres. In the borderline (dimorphous) type a mixed picture is found. Both purely tuberculoid and purely lepromatous pathology can also be found simultaneously.

Degeneration and regeneration of nerve is a continuous process In both normal subjects and in leprosy patients. A considerable number of nerve fibres must be destroyed before denervation can be clinically manifest. Sensory loss is very important from the point of view of deformities. An anaesthetic hand can render certain trades virtually impossible. Even more important is the absence of the 'warning mechanism' of the extremity, which may lead to deformities.

Neuritis during the 'lepra reaction' causes pain, swelling and tenderness of the nerve, and frequently deterioration of motor and sensory functions. A tuberculoid nerve abscess may also appear. Neuritis is an important factor in the development of deformities. Treatment of the reaction is an imporiant part in the prevention of deformities. Both motor and sensory impairment can recover spontaneously under treatment. Surgical interference may sometimes help. Medical treatment includes administration of corticosteroids, chloroquin. etc. Application of heat and immobilisation in relaxed position of the affected limbs are recommended.

The neurological patterns in leprosy are fairly well defined. There may be sensory impairment or motor paralysis.

A. PATTERNS OF ANAESTHESIA

Three types are met with, viz. (a) disseminated anaesthesia; (b) regional anaesthesia, and (c) acral anaesthesia.

1. *Disseminated anaesthesia.* In this impairment there is inability to recognise fine touch as well as the site of stimulus. The circumscribed complete anaesthesia belongs to the tuberculoid group. The borderline and indeterminate groups usually have some impairment, and lepromatous lesions often have preserved sensation.

2. *Regional anaesthesia.* Some of the major nerves are liable to be involved, such as,

(a) Ulnar nerve at the wrist or the elbow, producing anaesthesia of the ulnar part of the hand and forearm.

(b) Median nerve at the wrist or rarely at the elbow, involving the palmar aspect of the thumb and radial side of the hand. This is most crippling of the anaesthesia.

(c) Radial nerve in the arm or the forearm, producing the claw hand. This is a rare type.

(d) Posterior tibial nerve just behind the tibial malleoli, produce the plantar trauma syndrome.

(e) Lateral popliteal nerve in the popliteal fossa.

These complications play a major role in the development of deformities. In the tuberculoid type there may be involvement of one or a few of the nerves, while in the lepromatous type there may be more widespread involvement. This is also true of the borderline cases.

3. *Acral, anaesthesia.* Typical manifestations include glove and stocking anaesthesia and corneal anaesthesia. This is due to a widespread destruction of the terminal fibres without reference to a particular major nerve. It plays an important role in the development of secondary deformities of the hands, feet, and eyes.

In advanced cases of anaesthesia concomitant anhydrosis is present.

B. PATTERNS OF MOTOR PARLYSIS

This is selective in nature. It tends to involve motor branches to particular muscles, leaving other branches unaffected–though following certain patterns:

(a) Low ulnar paralysis, attacking ulnar nerve at the wrist with paralysis of the intrinsic muscles of the hand with exception usually of abductor pollicis brevis, radial hand of flexor pollicis brevis, opponens pollicis, and the two radial iumbrical muscles.

(b) High ulnar paralysis affecting the uluar nerve at the elbow.

(c) Low median paralysis, with paralysis of the abducior pollicis brevis, radial head of flexor pollicis brevis, opponens pollicis and the two radical lumbrical muscles.

(d) High median paralysis–the long flexors are paralysed to a varying extent. Fronator teres and flexor carpi radialis are rarely affected.

(e) Radial paralysis is rare. The extensors of the wrist and the digits are affected in a variable pattern-it is an exceedingly crippling condition.

(f) Posterior tibial paralysis–This is quite common and involves intrinisic paralysis with development of clawing of the toes.

(g) Complete lateral popliteal paralysis, with involvement of the peroneal group. This produces the clinical picture of equino-varus foot with drop toes. When there is also posterior tibial paralysis, drop toes are supplanted by claw toes.

(h) Incomplete lateral popliteal paralysis involves the dorsiflexors of the ankle and digits.

(i) Facial nerve paralysis, with simultaneous involvement of the frontalis muscles, produce the distessing condition of lagophthalmos. It may be combined with corneal anaesthesia and damage the eyes.

Here also the tuberculoid type tends to produce isolated patterns, while the lepromatous or borderline type tends to produce widespread paralysis.

Preoperative requirements. In most cases it is possible to restore useful, even normal, function to the paralysed parts. During surgical treatment, the patient should continue regular medication for not less than three months, and must not present signs of lepra reaction or progressive disease for three months. The bacterial index should also be low, otherwise there will be a tendency towards lepra reaction and progressive disease. The patient must have been without evidence of secondary infection for not less than 14 days, preferably one month, before surgery. No attempts at reconstructive motor surgery should be undertaken until the paralysis is established well beyond the chances of recovery. A stable period of six months is accepted as the limit.

Preventive and corrective physiotherapy. At the slightest hint of onsetting paralysis, a full programme of physiotherapy should be instituted. This will make subsequent surgical procedure much easier. Similar considerations are applicable to education and training of the patient with sensory impairment.

For restoration of function in early cases of neural damage, cases should be sent to competent centres as far as possible. The following categories should be given high priority in the reconstructive programme:

(a) Children and young persons.

(b) Persons with a strong wish and possibility of returning to work, and

(c) Persons with lagophthalmos, particularly those with concomitant impairment of corneal sensation.

For endangered vision the restrictions on operation imposed by a high bacterial index can be relaxed considerably, although an active stage of the disease may set off highly undesirable complications in the eye, triggered off by surgical interference. The six month time limit also is not applicable to cases of lagophthalmos. For endocular operations the patient must be strictly negative for a long period. Even then the risk is considerably higher than in other operations.—From an article by J. G. Andersen, *J. Christ. M. A., 36*: 175, 1961.—J. Indian M. A., Vol. 36, No. 12, June 16, 1961, 586-587.