COMMON PERONEAL NERVE PALSY DUE TO POSTERO-LATERAL DISPLACEMENT OF FRACTURED LATERAL TIBIAL PLATEAU

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SUMMARY

Numerous aetiopathologic factors have been enumerated as the possible causes of injuries to the common peroneal nerve at knee. This report presents a case of postero-lateral displacement of the upper end of fibula consequent to the displacement of fractured lateral tibial plateau leading to common peroneal nerve palsy which has not been reported before.

INTRODUCTION

The peculiar anatomical features of the common peroneal nerve and its nutrient vessels render it particularly susceptible to injuries near the lateral aspect of the knee joint (Sunderland, 1968). Numerous aetiopathologic factors have been enumerated as the possible causes of injuries to this nerve at this site such as; posterior-dislocation of the proximal tibio-fibular joint (Lyle, 1925); fracture of the neck of fibula (Perrin and Libry, 1926); forcible extention of a knee that has been ankylosed in flexion (Woltman, 1930); pressure caused by (i) an improperly applied plaster cast, (ii); the leg braces of the obstetric table, and (iii) a tight bandage or a strap of the knee pad (Selig, 1938; Burkhart and Daly, 1966); compression of immobile limbs in hemi or paraplegic patients on the hard surface of the bed which produces peripheral lesions superimposed on the central lesion (Lewin, 1943); compression from an osteoma of the neck of the fibula (Weddell, Feinstein and Pattle, 1943); the effects of pressure produced by ganglion cysts (Parkes, 1960; Barrett and Cramer, 1963); compression-ischaemia from crossing of the leg or adopting an unusual posture such as squatting or kneeling (Marwah, 1964); superficial laceration about the upper end of the fibula (Sunderland, 1968); an injury from an enlarged fabella (Mangieri, 1973); a compression due to the presence of a fibular fibrous band located between the lateral border of the fibula, 1 to 2 cm inferior to its head on the one hand and the soleus and the peroneus longus on the other (Gloobe and Chain, 1973); and a superior dislocation of the head of the fibula seen commonly in parachute jumpers (Crothers and Johnson, 1973; and Ogden, 1974). This paper reports an unusual case of common peroneal nerve injury as a result of postero-lateral displacement of the fractured lateral tibial plateau.

PATIENT AND METHODS

The patient B.H., a 31 year-old Malay male was admitted to the Department of Orthopaedic Surgery, National University of Malaysia, Kuala Lumpur for injuries to his right knee sustained after falling off from his motorcycle. Clinical examination revealed the right knee was swollen and had multiple superficial abrasions across the front of the joint with loss of active movements.

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It was tender on palpation and passive movement was restricted by pain. The knee was held flexed at 10 to 15 degrees both on standing as well as in recumbency. There was an associated foot drop together with loss of pain and touch sensation over lower third of the lateral surface of the leg and the dorsum of the foot on the affected side. The general condition was good and no other abnormality was seen. A postero-lateral displacement of the right fractured lateral tibial plateau was noticed in the 'X'ray (Fig. 1).

The initial treatment comprised aspiration of blood (112 ml.) from the knee joint. At operation, one week later, the common peroneal nerve was found intact but stretched around the neck of the fibula which was pushed postero-laterally by the displaced lateral tibial plateau. Screw fixation of the tibial plateau using Groll's screw with bone graft was performed. The electrical reaction of the tibialis anterior muscle was tested and the intensity duration (I/D) curve was traced at nine weeks after the injury. The curve showed the evidence of partial injury to its nerve (Fig. 2). Post-operative management consisted of regular Faradic stimulation of the muscles in anterior and lateral compartments of the leg and remedial exercise. Forty-three weeks after the injury, satisfactory recovery in sensory and motor functions was observed with almost normal "intensity duration (I/D) curve" of the tibialis anterior muscle (See Fig. 2).

DISCUSSION

The history of injury, the clinical presentation and the radiologic evidence strongly suggested a concomitant damage to the common peroneal nerve accompanying the displaced lateral condyle of the tibia. The operative findings of a stretched nerve at the upper end of the fibula provided the corroborative evidence. The pattern of the I/D curve studied at nine weeks after the injury also confirmed the nerve damage. The gross displacement of the lateral condyle of the tibia pushed the upper end of the fibula together with the intact proximal tibio-fibular articulation resulting in the over stretching of the common peroneal nerve to an extent whereby some intraneural damage must have inevitably taken place.

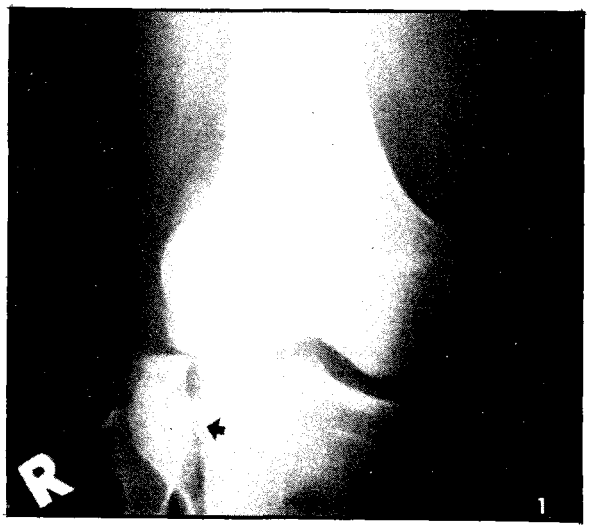

Fig. 1. Postero-lateral displacement of the fractured lateral plateau of the right tibia. Bone fragment [arrow] snugly wedged within the fracture preventing reduction.

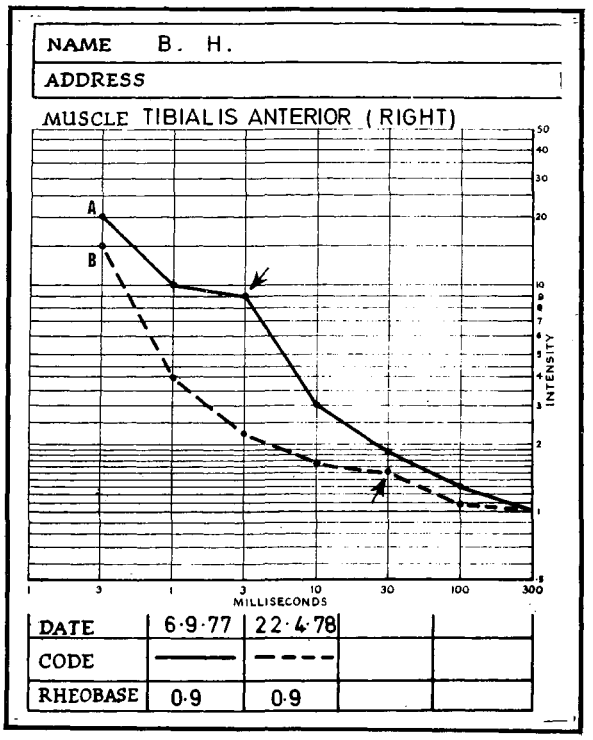

Fig. 2. [A] The intensity duration curve of right tibialis anterior muscle taken at nine weeks after the injury shows prominent bend [arrow], which indicates that the muscle is partially denervated.

[B] The intensity duration curve of the same muscle taken forty-three weeks after the injury shows a slight bend [arrow] on the right lower part, indicating almost complete reinnervation of the muscle.

REFERENCES

Barrett, R., and Cramer Fritz.(1963) Tumors of the peripheral nerves and so-called "Ganglia" of the peroneal nerve. *Clin. Orthop.* **27**, 135-146.

Burkhart, F.L. and Daly, J.W. (1966) Sciatic and peroneal nerve injury. A complication of vaginal operations. *Obstet. Gyne. N.Y.*. **28**, 99-102.

Crothers, O.D. and Johnson, J.T.H. (1973) Isolated acute dislocation of the proximal tibiofibular joint, case report. *J. Bone Jt. Surg.*(Am) **55-A**, 181-183.

Gloobe, H. and Chain, D. (1973) Fibular fibrous arch, anatomical considerations in fibular tunnel syndrome. *Acta Anat.* **85**, 84-87.

Lewin, W. (1943) Pressure palsy in the paralysed limb. *Lancet.* **2**, 756.

Lyle, H.H.M. (1925) Traumatic Luxation of the head of fibula. *Ann. Surg.*, **82**, 635-639.

Mangier, J.V. (1973) Peroneal nerve injury from an anlarged fabella. *J. Bone. Jt. Surg.* **55-A**, 395-397.

Marwah, V. (1964) Compression of the lateral popliteal nerve. *Lancet,* **2**, 1367.

Ogden, J.A. (1974) Subluxation and dislocation of the proximal tibio fibular joint. *J. Bone Jt. Surg.* [*Am*] **56-A**, 145-154.

Parkes, A.R. (1960) Intraneural ganglion of lateral popliteal nerve. *J. Bone Jt.* **42-B**, 652.

Selig, S. (1938) Peroneal paralysis due to compression by adhensive plaster. *J. Bone Jt. Surg.*, **20**, 222.

Sunderland, S. (1968) Nerves and nerve injuries. pp, 1069-1095. E. and S. Livingstone Ltd., Edinburgh and London.

Weddell, G., Feinstein, B. and Pattle, R.E. (1943) The clinical application of electromyography. *Lancet,* **1**, 236

Woltman, H.W. (1930) Pressure as a factor in the development of neuritis of the ulnar and common peroneal nerves in bedridden patients. *Am. J. Med. Sci.* **179**. 528