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ABSTRACTS OF SELECTED PAPERS

Surgical Reconstruction of the Upper Limb in Traumatic Tetraplegia

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It is estimated that approximately 500 new spinal cord injuries occur in the United Kingdom each year, *i.e.* approximately one per 100,000 of the population. Statistics collected from the main Spinal Injury Units show that about 60 per cent of these injuries affect the cervical spine. Most of these affect young people at the height of their physical powers and are usually complete lesions. Because of the excellent quality of the initial management of the injury and the prevention of complications, the life expectancy for these patients is not uncommonly 25 or 30 years.

All of these patients have varying degree of involvement of the upper limbs, and in our series 70 per cent of the patients reviewed had survival of muscle power of the muscles supplied by the sixth cervical segment and above. In practice this means:— (1) absence of elbow extension; (2) no finger or thumb movement.

In this group it is our belief that significant help can be provided in self care activities by tendon transfers to restore elbow extension and finger grasp.

Over the past 20 years we have operated on 41 patients who came into this category, to restore finger and thumb flexion by tendon transfers. The routine transfer has been that of the extensor carpi radialis longus into the long finger flexors and the brachio-radialis into the flexor pollicis longus. Active wrist dorsiflexion is maintained by the extensor carpi radialis brevis. On dorsiflexing the wrist a side key pinch of thumb to the middle segment of the index finger is provided. Objects are released by dropping the wrist. These patients have recently been reviewed, the average follow-up period after operation being $7\frac{1}{2}$ years.

At follow-up, a series of tests of hand function, activities of daily living and person and social achievement were carried out. These showed a significant improvement in the function of the hand in the severely disabled patients.

Since Moberg described the deltoid to triceps transfer in 1975 (Moberg E., 'Surgical Treatment for Absent Single-Hand Grip and Elbow Extension in Quadriplegia'. *J.B.J.S.* (Am), 1975 **57A** 196; and Moberg E., '*The Upper Limb in Tetraplegia: A New Approach to Surgical Rehabilitation*'. George Thieme, Stuttgart, 1978) I have operated on over 20 patients who have lacked the ability to stabilise the elbow against gravity. In the paper under review 10 patients who had had this operation were assessed. All patients had restoration of active elbow extension of power 4+ or 5 (MRC grading) with the exception of one patient who only had the ability to extend the elbow fully against gravity but without resistance. All patients felt considerable functional benefit from this procedure and requested operation on the second side. It is our belief that this is a significant advance in the management of patients who have lost elbow extension, but for the best

results we feel that it is important to follow the criteria described by Moberg for the operation and the post-operative management.

We appreciate that various orthoses and aids can be utilised in these circumstances to improve upper limb function. It has been our experience however where possible that patients prefer to have the use of their own hands in preference to an orthosis.

In the group under consideration the sensation in the hand is usually quite adequate to make full use of the grasp provided by tendon transfer.

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Harrington Instrumentation as a Method of Fixation in Fractures of the Spine. S. D. Gertzbein, D. MacMichael & M. Tile. *Journal of Bone and Joint Surgery*, (1982), **64(B):** 526–529.

A retrospective study of 36 patients with spinal injuries treated by Harrington rod fixation and spinal fusion (of varying lengths) is presented. The patients were treated at the Sunnybrook Medical Centre, Toronto, and the follow-up was from 1–5 years. Twelve patients had complete cord lesions and none of these improved. Eleven patients had a partial neurological deficit (no differentation between cord and nerve root lesions is given), and, as might be expected, all of these improved to a varying degree. The assessment considered pain, neurological status and deformity. It was found that the fracture pattern influenced the maintenance of reduction in a significant number of patients. A tailored brace was worn for 3–6 months but, surprisingly, the initial post-operative period of bed rest was only 10–14 days. The authors tend to equate pain with local bony deformity but this is not always a valid assumption. Some of the poor results are attributed to faulty technique. It is concluded that Harrington instrumentation alone is not sufficient to maintain alignment (especially in burst fractures), and that anterior stabilisation and grafting should be considered as well.

COMMENT (T.McS.). The sub-title of this paper is 'A Critical Analysis of Deficiencies' and in their balanced account the authors stress those problems which require critical evaluation. While agreeing that the Harrington system provides reasonable fixation for fractures of the spine, they suggest that perhaps the newer generation of fixation devices will solve some of the problems. Clearly, an eclectic approach is essential and generalisations with regard to the internal fixation of thoraco-lumbar injuries must remain under review.

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