THE TREATMENT OF CERVICAL SPONDYLITIC MYELOPATHY
BY MOBILISATION OF THE CERVICAL CORD INTO AN
ENLARGED SPINAL CANAL

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"... wherever the cerebro-spinal fluid has been able to escape into the tissues it has been everywhere walled off by a dense impervious membrane... its inner surface is smooth and glistening..."

Wilfred Trotter

MYELOPATHY complicating cervical spondylosis results from the effect on the cord of the projection into the spinal canal of a degenerative intervertebral disc or discs in the form of a hard bar or bars and is an indication for treatment to prevent irreversible changes taking place in the cord.

Problems are presented by surgical treatment. It would be logical to remove the protuberant disc or discs but while the soft nuclear material which occasionally is extruded from a cervical intervertebral disc, particularly in a young man, is as readily removable as it is in the case of a lumbar disc, the hard transversely lying bar or bars characteristic of cervical spondylosis are not easily removable and attempts to do so are so fraught with danger to the cord that it is better to avoid this procedure and seek an alternative one.

CLINICAL FEATURES

An excellent account of the clinical features is given by Spillane and Lloyd and this aspect will not be discussed here.

PATHOGENESIS

The cord is affected during movements of the neck by minor contusions by the hard bars of the projected intervertebral discs and repeated injury, as O'Connell has stated, appears to be a more important cause than compression. Evidence of this was presented by Bedford et al. who commented on the fixation of the cord which also may be present in these cases. Compression may play some part however, particularly if the original dimensions of the spinal canal are less than average.

For these reasons local decompressive operations at the site of the hard bar or bars are usually too limited and disappointment has followed such operations, though it is of interest to note that Victor Horsley in 1892 had a successful result from a limited laminectomy in a patient in whom he found a hard transverse bar at the level of the 6th cervical vertebra. This is probably one of the earliest operations to have been performed for the condition. (I am indebted to Sir Francis Walshe for drawing my attention to this.)

It appeared to us to be preferable to mobilise the cervical cord as a whole and enlarge the canal in which it lies. In normal conditions there is only slight anteroposterior mobility of the cervical cord and investigations in the cadaver made with the help of Dr. E. E. Payne of the Department of Pathology at Cardiff, to whom I am much indebted, both confirmed this and the observations of the Swedish anatomists, Key and Retzius and, more recently, those of Kahn of Ann Arbor, on the importance of the dentate ligaments in restricting its movements. Dr. Payne and I were astonished to find how mobile the cervical cord became, both laterally and to a lesser extent anteroposteriorly, when the whole length of the

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attachments of these ligaments to the dura mater was divided on either side of it.

In the first patients I operated upon, the mistake was made of not performing a complete cervical laminectomy and of using fibrin film to close the gap left by the open dura mater. At a second operation on one of these patients the film was seen to have adhered to the cord and it was evident that fibrin film would not isolate the cord. Remembering Wilfred Trotter's observation in his Horsley Memorial Lecture from which the introduction to this paper is a quotation, of the way in which cerebrospinal fluid produces neural isolation, I next endeavoured to leave the mobilised cord free in a pool of cerebrospinal fluid by letting the fluid seep through the open dura mater and accumulate around the cord and by using gravity to keep it there.

THE OPERATION

With the patient prone and the head flexed, an incision is made from the under surface of the occiput to the spinous process of the 2nd thoracic vertebra. The spines and laminae of all the cervical vertebrae and the 1st thoracic vertebra are removed, the dura mater is opened longitudinally, its edges are retracted and all the slips of the dentate ligament that lie on either side of the cord are divided. One or more hard bars are found lying in front of the cord, causing it to be pushed backwards. After haemostasis has been secured, the dura mater is left unsutured throughout and the masses of muscle are approximated with interrupted catgut sutures at a little distance from it so as to create a spacious canal in which the mobilised cord can lie. To keep this canal full of cerebrospinal fluid, as soon as the remainder of the suturing of the wound is completed the patient is tilted head downwards and transported back to the ward in this position and nursed in it for the next 3 days. Lumbar puncture is performed daily to keep a free circulation of the fluid and wash away any contamination produced by the oozing of blood into it.

INDICATIONS FOR OPERATION

The indications for the operation are signs of involvement of the cord occurring in cases of cervical spondylosis. It is at this stage that measures should be taken to protect the cord from further injury and prevent the development of irreversible lesions.

RESULTS

I have now performed 38 operations on 34 patients varying in age from 38 to 72 years; 25 were men and 9 were women. There has been no death and although it is only 6 years since the first of the series was operated upon and spondylosis is a degenerative and usually progressive condition, the results have been both encouraging and gratifying, particularly so in the more recent members of the series in which the operation has been more complete and modified as described. In one advanced case early in the series 8 operations were performed; improvement followed the first operation but then further deterioration occurred and this was not improved by the subsequent operations. It was this case that illustrated the failure of fibrin film to isolate the cord. In no case has there been any weakness of the cervical spine or disability from the complete laminectomy of this mobile part of the spine. If care is taken not to damage either the intervertebral articulations or, by too heavy retraction, the post vertebral muscles, there is no disability after the complete laminectomy and it is not long after operation that movements of the neck are fully restored.

CASE REPORTS

Brief histories of some cases taken at random from the series are as follows:

Case 1. T.W.D., a fitter's mate, aged 58, with cervical spondylosis, a narrowing of the intervertebral space between C4 and C5 and sclerosis and anterior and posterior osteophytes, had a history of injury 14 months previously.

He had spastic paraparesis and paraesthesia and an unsteady gait. There was increased tone with diminished power in the legs, the plantar reflexes were extensor and there was numbness with impaired tactile sensation over the tips of the fingers. He was a thickset man with a short
neck and myelography showed almost complete block at the level of C4-C5.

Laminectomy revealed a hard bar at this level. After operation disappearance of symptoms and restoration of function were complete.

**Case 2.** A.P.M., a clerk, aged 65, with gross cervical spondylosis and a narrow cervical canal, had a history of 2 years’ unsteadiness of gait. His right leg was spastic and there was wasting of the right and left triceps. Knee and ankle jerks were exaggerated. Lumbar cerebrospinal fluid was slightly xanthochromic with a protein content of 255 mg. and only 6 cells per c.mm.

At operation the cord was seen to be pushed backwards by two hard bars between C2-C3 and C3-C4.

He made a good recovery and was relieved of his symptoms.

**Case 3.** D.A.D., a married woman, an equestrian aged 47, with cervical spondylosis, a lesion of the intervertebral disc between C5 and C6 and a slight narrowing of the lower part of the cervical canal, had pain and paraesthesia in both upper limbs and walked unsteadily with a tottering gait. She also had pain in the back of her neck and her shoulders and ascribed her condition to a fall 2 years before which was followed a fortnight later by pain in the neck. She had weakness of the left lower limb and both plantar responses were extensor.

Operation revealed a hard bar pushing the cord back at C5-C6. Complete cervical laminectomy and mobilisation of the cord were followed by relief of symptoms and she is now walking normally.

**Case 4.** O.G., a plasterer, aged 42, was severely handicapped by progressive paraesthesia in the arms and hands and weakness of both legs. Knee and ankle jerks were exaggerated and plantar reflexes were extensor. Myelography showed an almost complete block at the C5-C6 level and a reduction from 17 to 15 mm. of the sagittal diameter of the spinal canal at this site.

Improvement was rapid after complete cervical laminectomy and mobilisation of the cord. Symptoms disappeared and the plantar responses became flexor.

**Case 5.** F.N.M., a florist, aged 47, with cervical spondylosis, a narrowed intervertebral space between C6 and C7 with marginal sclerosis and posterior osteophytosis and a history of pain in the neck over the past 2 years, had weakness of the left grip and slight impairment of sensation.

After operation he lost all symptoms and 2 years later was still free from symptoms and had resumed full work.

**CONCLUSION**

Although cervical spondylosis is a degenerative condition with a tendency to be progressive as age advances, only comparatively few of those afflicted with it have development of myelopathy as a complication. The appearance of signs of involvement of the cord, however, is an indication for operative treatment by mobilising the complete cervical cord into an enlarged spinal canal to relieve it from the repeated insults by the “hard bars” of the degenerative intervertebral discs to which it is otherwise subjected when movements of the cervical spine take place.

**SUMMARY**

A description is given of a method, which has proved effective in practice, of mobilising the whole extent of the cervical part of the spinal cord into an enlarged spinal canal in cases of spondylitic myelopathy.

**REFERENCES**


