Microsurgical Cordotomy in 20 Patients with Epi-/Intradural Fibrosis Following Operation for Lumbar Disc Herniation

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Summary

Using an improved microsurgical technique, cordotomy was carried out by the cervicothoracic route in 20 patients with persistent radicular pain due to epi-/intradural fibrosis following operation for lumbar disc herniation. 65% of them had good long-term results with respect to radicular pain (follow-up period 6–132 months; mean 66 months). Permanent severe motor impairment was not observed. In patients with severe pain of benign organic origin microsurgical cordotomy can be considered as a “last resort”.

Keywords: Microsurgical cordotomy C8/Th1; lumbar disc surgery; lumbosacral fibrosis; failed back surgery syndrome.

The main problems with cordotomy are recurrent pain and complications, especially motor impairment. A total of 90 patients were operated on using a special microsurgical technique (usually C8/Th1). 66 patients presented with cancer related pain. A study has been made of a group of 20 patients with severe, intractable, radicular pain due to epi-/intradural fibrosis after operation for lumbar disc herniation. The results are compared with those of other authors with experience of similar or other non malignant pain syndromes. Then, we have set out the indications for the microsurgical and percutaneous methods as developed in the Aarau Neurosurgical Clinic and adopted also by some French neurosurgeons in particular.

1. Patients and Method

During the period 1973–1988 microsurgical cordotomy was performed 96 times in a group of 90 patients, presenting with severe pain of organic origin in the region of the legs and pelvis. 93 times, the operation was performed at a level C8/Th1, 3 times in the upper cervical region (C1/2). 66 patients were suffering from malignant tumours, 24 from benign lesions.

In 20 cases, severe intractable lumbar/radicular pain was due to epi/intradural fibrosis following surgical treatment of lumbar disc herniation (LDH). This group of patients has been the subject of the present retrospective study.

The diagnosis of epi-/intradural fibrosis was based on clinical and neuroradiological findings (CT following contrast administration, functional myelography). All 20 patients had persistent pain causing invalidity, and not responsive to conservative measures, and finally, spinal cord stimulation. Epidural test stimulations were carried out in all these patients. Either the results of these tests were unfavourable, or a definitive stimulator implantation was followed later by recurrence of the pain (8 patients).

Almost all patients had low back pain, but radicular pain was predominant. 15 patients had slowly progressing pain associated with multisegmental sensory impairment (dys- or hypeaesthesia). Duration of pain before cordotomy was 3–10 years (mean 4½ years) (Table 1).

There were 9 women and 11 men with an average age of 52 years (31–82 years) and a mean follow-up period of 66 months (6–132 months) subsequent to the cordotomy (Table 2).

Operative Technique

A total of 22 cordotomies C8/Th1 were performed in the 20 patients. In two cases the operation was bilateral performed at two different stages, with the left and right incision separated by a distance of one segment.

In our view operation technique plays an important role. Our technique used since 1974 is careful and, at the same time, radical. The upper thoracic approach is made via an enlarged hemilaminectomy, in the upper cervical spine we use the method of Schwartz.

A small incision of the spinal cord with a cordotomy positioned exactly ventral to the attachment of the dentate ligament (Fig. 1) is

Table 1. Intractable Pain due to Epi-/Intradural Fibrosis Following LDH-Operations (n = 20)

<table>
<thead>
<tr>
<th>Pain Description</th>
<th>Number of Patients</th>
</tr>
</thead>
<tbody>
<tr>
<td>Radicular pain, leg (predominant)</td>
<td>20 pat.</td>
</tr>
<tr>
<td>unilateral</td>
<td>18 pat.</td>
</tr>
<tr>
<td>bilateral</td>
<td>2 pat.</td>
</tr>
<tr>
<td>Low back pain, midline (less important)</td>
<td>19 pat.</td>
</tr>
<tr>
<td>Polysegmental sensory disturbances</td>
<td>15 pat.</td>
</tr>
<tr>
<td>Duration of pain before cordotomy</td>
<td>3–10 years (mean 4½ years)</td>
</tr>
</tbody>
</table>
followed by opening, with microscissors, of the lateral wall of the cord, including the pia, at a site free of superficially visible vessels. This opening extends to the point of exit of the anterior nerve root (Fig. 2). A radical transection of the anterior quadrant’s tracts is then made, using a specially shaped blunt hook (5 mm long). So, even the ventral sulcus can be palpated without danger to the anterior spinal artery (Fig. 3).

2. Results

Long-term results are summarized in Table 2.

Effect on Pain

Immediately after the operation, all patients experienced adequate analgesia with disappearance of the radicular leg-pain. C8/Th1 cordotomy usually produced analgesia at the level of Th2–6. After a follow-up period of ½ to 11 years, analgesia had extended to Th4–9 in 12 patients (60%). These patients had no further radicular pain. In 5 patients (25%) analgesia had disappeared to a great extent or completely, mostly within the first 12 months. One patient (5%) had a partial, but sufficient and persisting pain effect. 2 patients (10%) experienced painful postcordotomy dysaesthesias, which they described as unpleasant as the preoperative pain. Mild and easily tolerated dysaesthesia was reported by 8 patients (40%).

So, 65% of our patients showed good to satisfactory results concerning radicular pain. Complete disappearance of low back syndrome (midline pain) was observed only in 3 cases (2 of them with bilateral cor-