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ANTERIOR CERVICAL FUSION FOR CERVICAL RHIZOPATHIES

A Follow-up Study

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Cervical rhizopathies are very painful and often protracted conditions, which as a rule will improve with conservative treatment. However, cases are quite often found where this treatment does not help and operation is thus indicated. Several types of operations have been described, e.g., decompression of one or more of the nerve roots (Frykholm 1951), evacuation of the intervertebral discs (Hult 1958, Hirsch 1961, Hirsch et al. 1964), and anterior fusions (Cloward 1959, 1963, Robinson et al. 1962, Robinson 1963). No matter which of these methods are used, the pre-operative decision is often difficult for the surgeon. This is usually because of overlapping of the neurological segments in the hand and the arm, making it difficult to determine which level of the cervical spine should be operated on, as well as because of the varying results seen with patients for whom the initial symptoms were similar.

Even with a thorough neurological examination, electromyographic studies, discogram, and cervical phlebography—localization of the correct level for operative intervention is not always certain (Robinson et al. 1962, Hirsch et al. 1964, Holt 1964). The best method of localization, as reported by Hirsch (1964), is myelography with positive contrast, a method not presently permitted in Sweden.

In this investigation the level of operation has been determined by a combination of roentgenographical findings and radiating pains in hand and fingers. The operation method described by Cloward (1959) has been used.

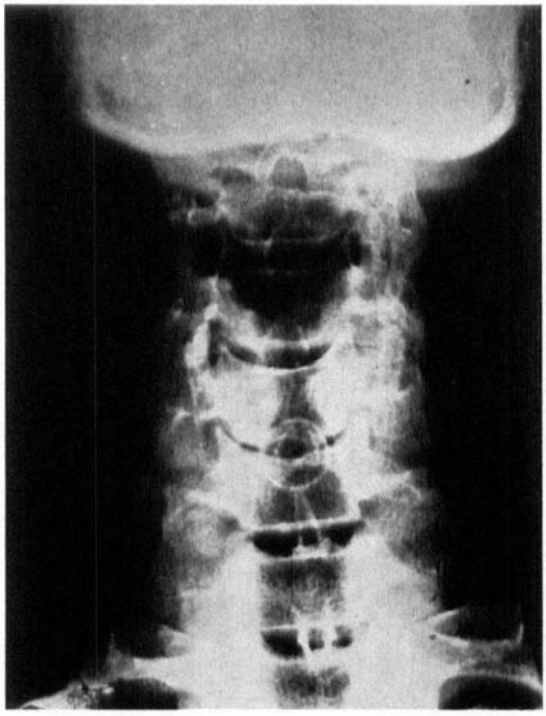

Figure 1. A-P view of cervical spine with hole and bone plug.

MATERIAL

Only those patients fulfilling the following criteria were operated:

1. Failure to achieve prolonged beneficial results after at least three months of conservative treatment (traction, collar, X-ray treatment, et cetera).

2. Signs of degenerative changes on radiographic examination of the cervical spine in no more than one intervertebral disc at the specific level.

3. The presence of distinct pain radiating from the cervical region to the fingers corresponding to the nerve root of the degenerated disc (the disc between C5 and C6 corresponds to the first and second finger, the disc between C6 and C7 corresponds to the second, third, and fourth finger, and the disc between C7 and T1 corresponds to the fourth and fifth finger). Those patients with diffuse pains in the cervical, shoulder, and arm region or with humeroscapular periarthritis were not operated. The operation itself was performed on the degenerated disc.

Twenty-three operations were performed on twenty patients (Table 1). Two patients required repeat operations because of recurrence at a second level and one patient because the first operation gave no improvement. The patients ranged in age from 27 to 61 years with all but two being older than 40 years (27 and 37 years). The duration of the pain prior to operation varied between six months and five years. All patients were followed-up, both clinically and radiographically, and demonstrated a healed fusion at the operated level (Figure 3). The chief point

Figure 2. Lateral view of cervical spine with hole and bone plug. The plug has been countersunk a few millimetres.

stressed in both the pre-operative and follow-up examination was whether the patient experienced pain and if he did, the types and localization of the pain. In addition, patients were evaluated with respect to neurological symptoms as well as diminished or painful mobility of the neck and joints of the upper extremity. Only one patient (No. 13 in Table 1) demonstrated positive findings using the latter criteria.

METHOD OF OPERATION

The anterior surgical approach as described by Southwick & Robinson (1957) was used and the fusion was performed according to a modification of the Cloward technique (1959). An opening was made in the mid-line over the disc and the adjacent two vertebral bodies with a 10 mm drill borer (Figure 1). Most of the disc substance was evacuated by this procedure. The opening was carried down to the

Figure 3. Healed fusion eighteen months after operation.

dorsal cortex of the vertebral bodies, then making it easy to evacuate the disc completely with a concotom. No attempt was made to remove any osteophytes. With a special borer a bone plug was taken from the iliac crest and immediately fitted into the opening in the cervical spine. The plug was inserted approximately 1 to 2 mm deep into the hole so that it could not easily be loosened (Figure 2). Postoperatively, a felt collar was placed around the neck with bed rest for one day. The patient was discharged from the hospital four to five days subsequent to surgery.

RESULTS

Table 1 illustrates the patient material and the results of the follow-up. Of the twenty patients studied, two (Nos. 1 and 2) were entirely pain-free; ten were considerably improved but had slight remaining pains,

Table 1.

Patient	Immediate results*	Results of re-examination	Age	Male = M Female = F	Level of operation	Duration of preoperative pains (mths)	Postop. observation time (mths)	Remarks
1	+	1	52	M	C5–C6	48	24	
2	+	1	44	M	C5–C6	7	4	
3	+	(1)	50	M	C6–C7	12	42	Reop. after 4½ years because of recurrence at another level
–	+	–	55	M	C7–Th1	6	1	
4	+	2	27	F	C6–C7	15	17	
5	+	2	47	F	C6–C7	7	18	
6	+	2	48	M	C6–C7	24	11	
7	+	2	42	F	C5–C6	9	10	
8	+	2	44	F	C6–C7	15	24	
9	+	2	44	M	C5–C6	12	18	
10	+	2	59	F	C5–C6	60	8	
11	+	2	53	M	C6–C7/C7–Th1	8	3	
12	+	2	61	M	C5–C6	5	5	
13	—	3	58	M	C6–C7	24	5	Mobility of the neck diminished to about half normal because of pain
14	—	3	37	F	C7–Th1	2½	18	
15	—	4	44	F	C6–C7	10	24	
16	—	4	44	M	C4–C5/C6–C7	38	78	
17	+	4	52	F	C6–C7	10	24	
–	+	4	54	F	C7–Th1	7	5	Reop. because of recurrence at another level after 1½ years
18	–	4	48	F	C6–C7	48	3	
19	—	4	39	M	C6–C7	42	18	
20	?	4	50	M	C6–C7	10	22	
–	?	2	50	M	C5–C6	6	18	Reop. because of no improvement within 4 mths after the first operation

* + Improved within one week postoperatively. — Not improved within one week postoperatively.

† 1: Complete improvement; 2: Considerable improvement—in full work; 3: Slight improvement—cannot work; 4: No improvement.

Table 2. Anatomical localization of the pain.
(23 operations)

	Pre-operatively	Postoperatively
Skull–fingers	2	2
Neck–fingers	19	10
Neck/shoulder–hand/finger	2	2
Neck	–	7
No pains	–	2
	23	23

two patients had slight improvement, and five had no improvement at all.

One patient (No. 3) was pain-free for four and one-half years subsequent to operation but a few weeks prior to re-examination, he was operated on because of recurrence at another level. The patients with complete improvement and considerable improvement were all at full work and had not sought medical advice for the mild pains they experienced.

No correlation was found between the results of operation, the age of the patient, the preoperative duration of the pains, the time of observation after operation, and the level of the operation.

Several of the patients reported considerable relief of pain during the first few postoperative days (Table 1, Column 2). These were the patients that displayed the best long-term results. In patients where there was no immediate postoperative relief of pain, the long-term results were not so good. This observation seems to demonstrate that positive results are dependent on the operation and not on the tendency towards slow, spontaneous healing often shown by the cervical rhizopathies.

In Table 2 several cases are illustrated with complete relief from pain in the hand and arm. Some pain in the neck still remained but not so severe as before surgery. Similar results are found in operations for herniated lumbar discs where sciatic pains disappear but the patient still has lumbar pain. In addition, two cases are shown where localization of the pain in the neck-shoulder and hand-fingers has been difficult to judge.

The operation has not only changed the anatomical localization of the pain but also the type of the pain itself. Pre-operative pains have

usually been severe and prolonged, sometimes continuous. Postoperatively, the pains have occurred intermittently for shorter durations and without the same degree of intensity as pre-operatively.

As the observation time postoperatively is short, we still can expect isolated recurrences in the group of good results. Because of the differences in the patient material it is difficult to compare the results of this investigation with the results published by Hirsch, Holt, Robinson, and Cloward. In all of these investigations there are several patients with more diffuse, subjective symptoms difficult to evaluate and with multiple disc degenerations in the cervical spine. Even taking these differences into consideration, no conspicuous differences can be found.

When one considers this operation as clearly improving half of the patient group and the fact that the operation is technically simple and well tolerated by the patient, this procedure is clearly justified for those patients in which conservative treatment has failed and no other treatment is available.

SUMMARY

Anterior cervical fusions according to a modification of the Cloward procedure have been performed on twenty patients with isolated degenerative cervical discs. The patients were re-examined three to seventy-eight months postoperatively. Twelve were considerably improved and had returned to full work.

Patients with lasting postoperative relief of pain all reported a clear improvement already within a few days post-operation. Patients without any lasting postoperative relief of pain as a rule did not report any improvement at all after the operation.

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