

Department of Orthopedics, Thomas Jefferson University Hospital,
Philadelphia, Pennsylvania.

THE NATURAL HISTORY OF SEVERE CERVICAL DISC DEGENERATION

A. F. DePALMA, R. H. ROTHMAN, R. L. LEVITT & N. L. HAMMOND, III

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From January, 1962 until September, 1968, 388 patients with the diagnosis of cervical disc degeneration failed to respond to a program of conservative therapy and were advised by the senior author to undergo anterior cervical disc excision and fusion. Of this group 281 consented and 107 refused surgery. The patients who refused operation represent the best available controls for those who underwent surgery and are an excellent population in which to study the natural course of severe cervical disc degeneration. Of these 107 patients, 68 were available for study.

Their ages, sex, occupations, symptomatology and period of follow-up were similar in all respects to those patients who underwent surgery.

Forty-four per cent of the control patients were involved in litigation proceedings; 56 per cent were not. Eighty-seven per cent of the litigation cases stemmed from whiplash injuries; conversely, 84 per cent of whiplash cases were accompanied by litigation. Accordingly, we were unable to separate these two factors in regard to their individual effect on the results.

The categories used to grade results are the same as those of Odom (1958). These criteria were easily evaluated by telephone interview using a standard questionnaire. The authors found no significant difference between the results obtained by telephone interview and those obtained by personal examination.

RESULTS

Non-operative Patients

The over-all results for this group are shown in Table 1. For purpose of more accurate statistical analysis, it was elected to combine excel-

Table 1. Results of non-operative patients.

Excellent	10 % (7)
Good	35 % (24)
Fair	21 % (14)
Poor	34 % (23)

Table 2. Litigation vs. results.

	Satisfactory	Unsatisfactory
Non-litigants	34 % (23)	22 % (15)
Litigants	12 % (8)	32 % (22)

($\chi^2 = 6.44$, $p < 0.02$).

lent and good results into one group designated *satisfactory*. Fair and poor results were combined under the heading *unsatisfactory*. Thus a satisfactory result indicates either complete absence of symptoms or mild discomfort without limitation of activity. An unsatisfactory result indicates significant pain and limitation of activity or no improvement. Forty-six per cent of all non-operative patients obtained satisfactory results whereas 54 per cent were rated unsatisfactory.

Thirty-two per cent of the patients, despite their discomfort, never lost time from work because of their symptoms. Twenty-five per cent returned to work within one month following the onset of symptoms, 19 per cent returned between one month and twelve months, and 24 per cent never returned to their original occupations.

There was no statistically significant correlation between results and any of the following factors: age, sex, presence of radicular symptoms and period of follow-up.

Litigation was found to affect adversely the quality of the results at a 2 per cent confidence level by the chi-square test. Satisfactory results were obtained by 61 per cent of non-litigants; however, only 27 per cent of litigants achieved satisfactory results (Table 2).

Operative and Non-operative Patients

The over-all results of the operative and non-operative groups are compared in Table 3. Satisfactory results were obtained by 63 per cent of operative patients; only 46 per cent of non-operative patients obtained such results. Since litigation adversely affects the results of non-operative treatment, but does not affect the results of operative treatment, we repeated the comparison after discarding all litigants

Table 3. Results of operative vs. non-operative patients.

	Operative	Non-operative
Excellent	35 % (81)	10 % (7)
Good	28 % (64)	35 % (24)
Fair	29 % (66)	21 % (14)
Poor	8 % (18)	34 % (23)

($\chi^2 = 39.00$, $p < 0.01$).

Table 4. Results of operative non-litigants vs. control non-litigants.

	Satisfactory	Unsatisfactory
Operative non-litigants	63 % (90)	37 % (53)
Control non-litigants	61 % (23)	39 % (15)

($\chi^2 = 0.03$, $p < 0.05$).

from both groups (Table 4). Satisfactory results were then obtained by 63 per cent of operative non-litigants and by 61 per cent of control non-litigants. Thus, when litigation was eliminated, there was no significant correlation between mode of treatment and results.

Patients with radicular symptoms did significantly better when treated surgically. Of the operative group with radicular symptoms 65 per cent obtained satisfactory results, whereas only 43 per cent of the non-operative group achieved the same results. There was no significant correlation between mode of therapy and results in those patients without radicular symptoms.

Although only 46 per cent of the non-operative patients obtained satisfactory results, they lost relatively little time from work. Within two months after the onset of symptoms, 68 per cent of these patients had returned to work full time.

One of the most significant findings of this study is that litigation-whiplash exerts a strongly deleterious effect on results. Gotten (1956) has called attention to the importance of litigation in determining the prognosis following whiplash injuries. He concluded that often the injury was being used by the patient as a convenient lever for personal gain. Once the claim had been settled, many patients improve appreciably.

Initially it seemed that patients with cervical disc degeneration did better when treated surgically. However, since we had previously shown that litigation-whiplash unfavorably prejudiced results in the control group, we repeated the comparisons after eliminating all

litigants from both groups. When this was done, results of the operated group and those of the control group were essentially the same.

Why is it that litigation-whiplash adversely affects the results of non-operative patients, but has no similar effect on the results of operative patients? We believe that if a litigant consents to surgery, it is almost certain that he has significant organic disease. Furthermore, he most probably has a strong desire to recover from his illness. Many of the litigation patients who refuse surgery, however, may have less serious organic disease. Their symptoms may be consciously or unconsciously exaggerated as a means of obtaining compensation. As long as the lawsuit is pending, it is to their financial advantage to manifest severe symptoms. Their symptoms and consequent disability will remain despite good conservative treatment. These patients will seek differing medical opinions to strengthen their legal cases but will not submit to surgery. We are unable to obtain a satisfactory separation of litigation and whiplash in our analyses. From an intuitive standpoint we tend to implicate the former as a cause of poor results. However, one might ask whether localized traumatic disease (i.e. whiplash) responds better to surgery than does a gradually developing generalized problem. This question remains unanswered.

Operative patients have a greater total period of disability than do non-operative patients, for they spent a median of 6.2 months between time of surgery and return to work. Sixty-eight per cent of non-operative patients had returned to work within two months after onset of symptoms. The percentage of operative patients who never returned to their original work (23 per cent) corresponds very closely to that of the non-operative patients who never returned (24 per cent). One can thus expect that regardless of the mode of treatment chosen, about one-fourth of patients with severe cervical disc degeneration will never return to their original occupations. Other factors being equal, one would tend to favor non-operative treatment since the period of disability is thereby shortened.

S U M M A R Y

1. Litigation and/or whiplash adversely affected the results of treatment in the non-operative group.
2. Patients with radicular symptoms did better operatively than non-operatively.

3. The period of disability is longer for operative patients than it is for non-operative patients.
4. Surgery should be reserved for those patients with severe cervical disc degeneration who have reached an unsatisfactory plateau after an adequate trial of conservative therapy.

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Correspondence to:

Dr. R. L. Levitt
Department of Orthopaedic Surgery
Jefferson Medical College
Thomas Jefferson University
Philadelphia, PA 19107
U.S.A.