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# CLINICAL OBSERVATIONS AND EVALUATION OF CONSERVATIVE TREATMENT OF ACUTE LOW BACK PAIN DUE TO DISC LESION

*By*

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Mixter and Barr (1934) demonstrated surgically the relationship between lesions of the intervertebral disc and sciatic radiculitis and the relief following excision of the protruding disc.

In the following years an enthusiasm for surgical treatment of this condition promoted the accumulation of tremendous experience and better knowledge of the diverse and multiple clinical aspects of the disc lesions, but there were many disappointments. While it is accepted that in good hands and with carefully selected patients surgery may bring up to ninety per cent improvement, only fifty per cent of them were completely relieved, while forty per cent were partially so. Reviewing most of the operative results, Armstrong (1951) states: "Anything between five and forty per cent of unsatisfactory surgical results have been reported". These poor results led to a reconsideration of the treatment of acute low back pain due to disc lesion. Inman and Saunders (1947) stated the general disappointment following the treatment of many such cases by laminectomy and nerve root decompression. Burns and Young (1951), despite their favorable statistical result in 951 operated cases, recommended a conservative approach because of the "spontaneous natural improvement in the evolution of this condition". Armstrong (1951) stressed a similar view: "It is clear and has been accepted that almost all patients recover partly or completely after conservative treatment alone".

## PERSONAL OBSERVATIONS

Considering the high percentage of LBP cases under our care—over fifty per cent of all attended cases—an analysis of part of our material

was undertaken in order to define further the position, means and limits of conservative treatment in acute LBP ± Sciatica.

Of more than 500 patients with a LBP condition which were under my care during the last three years, ninety patients presenting the acute clinical pattern of disc lesion were selected. The selection was made on the basis of the following findings: a) History of strain, b) Acute clinical picture of LBP ± Sciatica, c) Neurologic signs of root compression, d) X-Ray signs.

The majority of these selected patients had three and some of them had all these findings. Only a small group of these patients were under our care from the beginning of the illness, the majority were referred to us by the local physician after a few weeks of unsuccessful rest and analgetic treatment. Nearly all the patients were invited and reexamined recently, and stated their present condition, persistence of recurrence of pain, actual work and strain, persistence of previous neurological signs.

The analysis of this material considering sex, age, strain, kind of work, clinical findings, kind of treatment and end-results showed the following aspects:

A) Total number of patients = ninety

B) Sex: male = 67
female = 23

C) Age groups:

| | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 20 to 30 | = 13 | cases, | ( 9 | male | and | 4 | female) |
| 31 „ 40 | = 26 | „ | (21 | „ | „ | 5 | „ ) |
| 41 „ 50 | = 38 | „ | (27 | „ | „ | 11 | „ ) |
| 51 „ 60 | = 11 | „ | ( 9 | „ | „ | 2 | „ ) |
| over 60 „ | = 2 | „ | ( 1 | „ | „ | 1 | „ ) |

D) Physical strain of the patients at the beginning of the illness:

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|---|---|---|---|---|---|---|---|---|
| Light | strain | work | was | performed | by | 18 | patients, | |
| Middle | „ | „ | „ | „ | „ | 43 | „ | (includes 22 women) |
| Heavy | „ | „ | „ | „ | „ | 24 | „ | |
| Not known in | | | | | | 5 | „ | |

The strain was rated heavy or moderate according to heavy or moderate weight lifting. House work was considered a moderate strain work.

The relatively small number of cases in the third group seems to indicate that heavy strain is not the most important cause of disc lesions. Friberg & Hirsch (1949) in a far bigger report of 3672 cases observed that there was no direct relationship between heavy physical work and

disc damage occurrence. Does it really mean that heavy strain is not the most important cause of disc lesion? Not at all. Heavy strain is and remains the most important cause of disc lesion. All studied cases, independently of their usual work, had a history of a heavy strain preceding the occurrence of the acute LBP. It is natural that someone doing usually a light or middle strain job, may occasionally have to perform heavy work. Lets take for example the policeman, one of the cases studied. Usually he does light work, but on the first day of a two week vacation, he helps his wife with the housework and lifts a heavy bed. An acute disc condition is the immediate consequence. Such examples of occasional considerable strain occur with everyone who is apparently performing everyday light work.

The question which arises is: Why the relatively small percentage of acute disc conditions furnished by the heavy workmen themselves? Two words may stand as explanation: Selection and adaptation.

People with a physical debility would rarely if ever engage in heavy work. Further selection of the workmen is made by the institution procuring the work. Obviously, young and healthy people engaged in heavy work will get adapted to it by the continous increase in muscular power, thickening of the ligaments and perhaps of annulus fibrosus, altogether a natural reaction to strain. Steindler (1947) gave a similar explanation for the thickening of the ligamenta flava, a common and sometimes singular finding in many surgical explorations of the spine for disc condition.

Consequent on these changes it is assumed that heavy workmen become more resistant to strain. On the other hand, people doing light work are less or not adapted at all to considerable strain and when exposed to it they will break down easily.

E) As to the kind of work done by the patients the following representative groups may be enumerated:

| | | |
|---|---|---|
| 1) | Gardeners | 2.2 % of all cases. |
| | Textileworkers | 2.2 % |
| 2) | Agriculture | 4.4 % |
| | Locksmiths | 4.4 % |
| | Policemen | 4.4 % |
| 3) | Clerks | 5.5 % |
| 4) | Automechanics | 6.6 % |
| | Electricians | 6.6 % |
| | Drivers | 6.6 % |
| 5) | Porters | 7.9 % |
| 6) | Constructionworkers | 10.0 % |

Twentytwo women doing house work were not mentioned as a representative group because of the large variation in the strain range of this work and as only the female sex is represented.

It is interesting to note that clerks and drivers considered light workers, appear with a relatively high disc morbitidy, approaching the incidence of heavy jobs like that of porters. Building workers seem to be especially prone to disc condition.

This may be a characteristic of our country with a high percentage of new-comers unaccustomed to construction work. Nevertheless construction represents in our country the most important trade for absorbing new immigrants who previously were engaged in more or less light jobs in their country of origin. They constitute the bulk of the unadapted and sometimes the unadaptable, especially aged people.

An apparent high disc morbidity seem to be associated with housework and is represented in these statistics by the entire female group of patients. When asking one of these women what is she doing, the usual answer is simply: nothing, just housework. The consideration of a large variation in the strain range of this work, depending on economical and social conditions, does not diminish the importance of the high physiological and physical strain that every woman has to bear during pregnancy and labour: considerable increase in weight, increase in lumbar lordosis, pelvic ligamental relaxation, sometimes strain of the sacro-iliac or lumbo-sacral joints and later weak distended abdominal muscles. Obviously following such changes the spine becomes more vulnerable and disc conditions are more frequent.

F) The clinical picture manifested by all the reported cases bore the following aspects:

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| Low back pain + Sciatica | 54 cases |
| Low back pain alone | 34 „ |
| Sciatica alone | 2 „ |

Neurological findings were present in forty cases: there were reflex anomalies in 34 cases and sensory changes in 6 cases. Of these forty cases fifteen had associated reflex and sensory findings while five had reflex, sensory and motor anomalies. On recent reexamination persistent neurological signs were found in seventeen cases.

X-Ray pictures showed narrowing of the intervertebral space in sixty cases with the following distribution:

| | | |
|---|---|---|
| L 4–5 | 9 | cases |
| L 5–S 1 | 46 | „ |
| L 4–5 L 5–S 1 | 5 | „ |

The rest of the X-Ray pictures showed:

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| Spondylosis | 7 | cases |
| Scoliosis | 5 | „ |
| Hemisacralisation | 3 | „ |
| Normal spine | 15 | „ |

Of these ninety patients, twentyone had their first attack while sixty-nine had recurrent attacks of acute LBP.

The total of work days lost was roughly estimated to be 2560 corresponding to seventy patients, that means, 37 work days lost by every case on the average. Twenty women in non-salaried jobs were not included in this estimation.

G) The treatment was evaluated by estimating its effect on pain and function and ability to return to work.

We used A.C.T.H. and cortisone in a small number of acute cases and especially in those proved resistant to other kinds of treatment, in a way, as a last resort. We felt that the efficiency of a drug of high price, should be tested only on those patients not improved by the usual and simple methods.

So far our experience has met with disappointment. Only those patients benefited from this treatment in whom the acute disc lesion was associated with multiple degenerative changes in other discs and apophyseal joints. Actually we do not know enough about the effect of A.C.T.H. on the disc tissue. Does A.C.T.H. enhance healing of the disc lesion? Does the early use of A.C.T.H. determine a better healing of the disc lesion and consequently recurrence is prevented or diminished? Further research in this field will bring perhaps the answer to these questions.

Actually, the plaster jacket, manipulation, traction-extension, epidural block and in electrical physiotherapy iontophoresis with aconitine have proved of significant value in a considerable number of patients. The use of the epidural block contested by many, produced immediate relief of pain and sometimes over a long period. A few patients after many weeks of unsuccessful rest and analgetics treatment, had epidural block repeated at a few days interval with prolonged, nearly complete relief of pain, they could resume ambulation, do active exercises and

returned early to work. After epidural block, even if the complete relief is temporary, it was observed that the pain does not usually return to its previous intensity. This fact may be explained by a rise of the pain threshold, usually lowered for the compressed root, also by block of many reflex pain pathways from the trigger area. Two complications were observed following the epidural block: 1) Intradural injection with resultant spinal block in a patient with a very low dural sac. 2) Convulsive, hysteric fits in a woman, occurring after extraction of the needle and subsiding after a few minutes.

If the procedure is performed very carefully and with a short needle the first complication may be avoided.

The plaster jacket was used for one, sometimes two or three months in stuborn cases. The period of immobilisation was determined by the relief of pain. For ambulatory treatment the plaster jacket proved to be one of the simplest means of achieving immobilisation, support and rest. Patients early relieved of pain had the plaster removed after one month and some of them returned after a short period with a recurrence of pain. The conclusion that could be drawn is that relief of pain does not necessarily mean healing of the disc lesion.

Following the removal of the plaster jacket we used to provide the patients with a spine brace. We did not use a high one but the Hohmann belt or the modified frame of the Williams type. The subjective well-being of patients using these braces appears to be due more to support than immobilisation.

Manipulation was highly valued and used by leading orthopaedic surgeons such as Robert Jones & Bankart. Its use with or without anesthesia is still a matter of controversy. Many condemn it like Roberts (1955): "It is criminal to manipulate under general anesthesia except in the case of the young woman with little or nothing wrong with her". This statement, however, does not represent the opinion of P. Wiles, Pridie or Mc. Farland.

Merril Mensor (1956) reported good results in 45 per cent of industrial and 64 per cent of private cases in a series of 285 cases manipulated under pentothal anesthesia. I used in a small number of cases of acute disc condition of this series, the flexion, torsion and traction procedures. I was astonished by the immediate good results.

In lean patients it was done easily and usually does not require anesthesia. For athletes, very primitive or sensitive people, also excited or exaggerating patients, the general anesthesia proved to have a double good effect: First it assists manipulative procedures by relief of the

muscular spasm, secondly, it has a direct releasing effect on the excited brain.

We usually avoided, however, hyperextension of the spine, because of the danger of squeezing out an injured intervertebral disc.

In good hands with and carefully selected patients manipulation gave good results and minimal complications.

Pelvic traction proved valuable also in ambulatory treatment, while more efficient and persistent improvement was achieved in hospitalized patients. It must be mentioned that some patients reporting that they felt quite relieved while lying under traction-extension, complained that the pain was coming back while changing to sitting or standing position especially when they were treated ambulatorily. Only a few nervous or excited patients could not bear the traction-extension and discontinued treatment.

While it is supposed that pelvic traction determines muscle, ligamental and articular relaxation. Crisp (1953) claims he could measure a distraction of the spine in patients that were subjected to a traction power for 120 lb. for fifteen minutes.

Iontophoresis with aconitine as adjuvant therapy, produced remarkable and relatively rapid relief in 50 per cent of treated cases. It benefited mostly patients with serious sciatic pain. Aconitine, an alkaloid of Aconitum Napellus, exhibits a specific action on the terminal organs of the sensory nerves, characterized first by stimulation, prickling and warm sensation, later inducing depression with numbness at the place of application. This specific action may explain the disappearance of the reflected sciatic pain and hyperesthesia, after the treatment.

It may be mentioned that vitamin B 12 (1000 mu) and roentgen therapy proved to be of no significant help in acute disc conditions.

Two ore more of the enumerated conservative means had to be used in most of the patients. Any of these means used alone had an efficiency range not greater than 40 to 60 %.

The following are the end-results in this series of ninety patients:

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|---|---|---|
| Completely relieved and with full function ..... | 82 cases | = 91.0 % |
| Considerably improved, still a dull, persistent sciatic pain, but function only moderately impaired ..... | 6 „ | = 6.6 % |
| Not improved, needed operation ..... | 2 „ | = 2.2 % |

Operation was performed in one because of severe intractable pain, adhesions being found between injured disc L4–5 and L5–S1 and corresponding nerve roots, while in the second patient because of long

recurrent attacks of acute LBP, first of six months, second of three months duration, and incapacity to return to work. Both cases were relieved completely by operation.

Of these ninety patients,

| | | |
|---|---|---|
| Have returned to previous work | 84 cases | = 93.3 % |
| Have changed work | 6 „ | = 6.6 % |

Of these six patients, four were previously engaged in heavy and two in middlestrain work.

## SUMMARY

1. Ninety cases presenting the acute clinical pattern of disc lesion were studied; their clinical characteristics, the efficiency of conservative treatment and follow-up are reported in detail.
2. Strain is considered a direct cause of the acute disc condition.
3. Light workers are more susceptible to considerable strain and to acute disc condition.
4. A process of adaptation to strain was emphasized to explain the relative low percentage of acute disc condition furnished by the heavy strain workers.
5. Conservative treatment afforded complete relief in 91 per cent, partial relief in 6.6 per cent of cases. Surgery was necessary in only 2.2 per cent.
6. As a result of this treatment 93.3 per cent of the patients have returned to their previous work. Only 6.6 per cent changed work.

## RESUME

1. 90 cas présentant le type clinique aigu de la lésion discale ont été étudiés, leurs caractéristiques cliniques, l'efficacité du traitement conservateur et les examens ultérieurs étant rapportés en détail.
2. Un effort est considéré comme la cause directe de l'état discal aigu.
3. Les ouvriers ayant un travail facile sont plus exposés à un gros effort et à un état discal aigu.
4. Un processus d'adaptation à l'effort est relevé pour expliquer le pourcentage relativement faible de lésion discale aigu chez les ouvriers ayant à fournir un travail dur.

5. Un traitement conservateur a apporté un soulagement complet dans 91 % des cas, un soulagement partiel dans 6,6 % des cas. L'intervention chirurgicale n'a été nécessaire que dans 2,2 % des cas.
6. A la suite de ce traitement, 93,3 % des malades ont pu reprendre leurs occupations antérieures, 6,6 % seulement ont été obligés de changer de travail.

## ZUSAMMENFASSUNG

1. Neunzig Fälle mit klinischen Zeichen von akuter Zwischenwirbelscheibenschädigung wurden untersucht und ihre klinischen Besonderheiten, die Wirksamkeit der konservativen Behandlung und das Ergebnis der Nachuntersuchung bis ins Einzelne dargelegt.
2. Überbeanspruchung wird als direkte Ursache des akuten Zustandes angesehen.
3. Leichtarbeiter sind empfänglicher gegenüber bedeutender Beanspruchung und neigen mehr zu akuten Scheibensymptomen.
4. Es wird hervorgehoben, dass ein Anpassungsprozess gegenüber Beanspruchung zur Erklärung des relativ niedrigen Perzentsatzes von Scheibensymptomen bei Schwerarbeitern herangezogen werden muss.
5. Die konservative Behandlung ergab vollständige Beschwerdefreiheit in 91 %, teilweise Erleichterung in 6,6 % der Fälle. In nur 2,2 %, war ein chirurgischer Eingriff notwendig.
6. Der Erfolg dieser Behandlung war, dass 93,3 % ihre frühere Arbeit wiederaufnehmen konnten und nur 6,6 % den Beruf verändern mussten.

## REFERENCES

*Armstrong, J. R.:* The Causes of Unsatisfactory Results from the Operative Treatment of Lumbar Disc Lesions. J. Bone and Joint Surg. *33B*: 31–35, 1951.

*Burns, B. H. and Young, R. H.:* Results of Surgery in Sciatica and Low Back Pain. Lancet p. 245, 1951.

*Colonna, P. C.* and *Friedenberg, Z. B.:* The Disc Syndrome: Conservative Care of Patients with Positive Myelograms. J. Bone and Joint Surg. *31A*: 614–618, 1949.

*Friberg, S.* and *Hirsch, C.:* Anatomical and Clinical Studies on Lumbar Disc Degeneration. A. Orth. Scand. Vol. XIX 222–242, 1949.

*Inman, V. T. and Saunders, J. B. de C. M.:* Anatomico-physiological Injuries to the Intervertebral Disc. J. Bone and Joint Surg. *29*: 461–467, 1947.

*Jones Robert:* Manipulation as a Therapeutic Measure. Proc. Roy. Soc. Med. *25*: 1405, 1932.

*Mensor, M.:* Non-Operative Treatment Including Manipulation for Lumbar Intervertebral Disc Syndrome. J. Bone and Joint Surg. *37A*: 925–936, 1955.

*Mixter, W. J. and Barr, J. S.:* Rupture of the Intervertebral Disc with Involvement of the Spinal Canal. New England J. Med. *211*: 210–215, 1934.

*Roberts, N. W., Wiles, P., Pridie, K. H., MC. Farland and Others:* Symposium on the Lumbosacral Fusion and Low Back Pain. J. Bone and Joint. Surg. *37B*: 164–168, 1955.

*Steindler, A.:* An Analysis and Differentiation of Low Back Pain in Relation to the Disc Factor. (Symposium) J. Bone and Joint Surg. *29*: 455–460, 1947.