THE RELATIONSHIP BETWEEN THE MANIFESTATIONS OF PROLAPSED LUMBAR INTERVERTEBRAL DISCS AND THE RESULTS OF CONSERVATIVE TREATMENT

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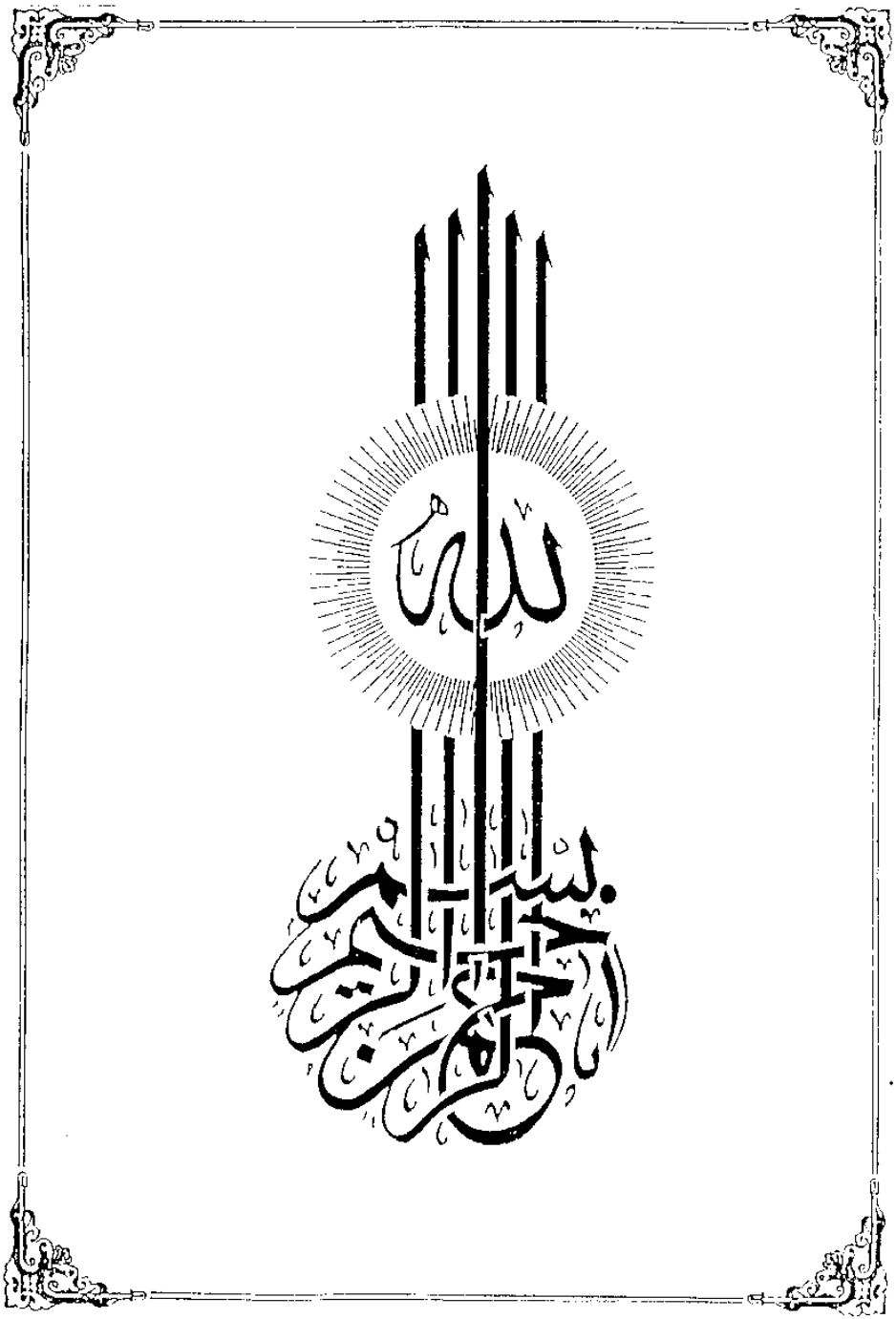

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This work was undertaken in a trial to correlate the relationship between the results of conservative treatment and the manifestations of the prolapsed lumbar intervertebral disc as regard the clinical presentation and the electromyographic changes.

By so doing we can find out bad prognostic criteria and select patients in need of surgical intervention early in the course of the disease.

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HISTORICAL REVIEW

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Recently, there have been an increasing number of ideas and researches dealing with the lumbar intervertebral discs prolapse into the spinal canal.

The essential features of the syndromes produced by many of these disc lesions, specially the syndrome of sciatica, were mentioned in the work of Hippocrates (Before Christianity).

The discs themselves were first described by Vesalius in 1555. More than two centuries later, in 1764, an Italian, Dominico Cotunio described sciatica as a clinical entity related to disease of sciatic nerve and was known as Cotunio's disease for many years.

The close association between sciatica and low back pain does not seem to have been clearly recognised until 1864, when Lasegue described the carriage and posture characteristically associated with sciatic pain. A little later Charcot in 1888 also described the typical spinal deformity and Brissaud in 1890, coined the term "sciatic scoliosis".

Some years earlier, in 1857, Virchow had been responsible for a much fuller account of the intervertebral discs a report of the tumour associated with his name. More complete describption of the discs was published by Von Luschka in 1858. In 1895 Ribbert reproduced Virchow's tumour by puncturing the intervertebral discs in rabbits.

In 1896 Kocher described the finding at post-mortem of a gross posterior displacement of the disc between the first and second lumbar vartebrae in a man who had fallen 100 feet to land in a standing position. This appears to be the earliest report of an actual posterior displacement of intervertebral disc material.

In 1911 Goldthwait published a paper which is noteworthy in that it contained a diagram showing an absolutely typical nuclear retropulsion of the disc between the fifth lumbar and first sacral vertebrae. Also in 1911 Middleton and Teacher in Glasgow described paraplegia of sudden onset occuring in a man of 38 who felt something "snap" in his back while he was lifting a heavy weight and in whom retropulsion of the disc between the twelfth thoracic and first lumbar vertebrae was found at autopsy 16 days later.

In 1916 Elsberg described certain extradural tumours of the spinal canal, which he called chondromata.

In the same year Sicard published a paper in which he postulated that sciatica was commonly due to an irritative lesion of the roots of the sciatic nerve in the interspinal course. He suggested that the term "neurodochitis" might be used to describe this condition.

In 1927 Putti summarised the views of those who belonged to this school of thought. Putti suggested that irritations or inflammations of the sciatic nerve might be classified according to the site of the causal lesion. He suggested that terms radiculitis, ganglionitis, funicultitis, plexitis and neuritis, and in his view most sciatica was due to irritation of the nerve roots in the spinal foramina. He further believed that this irritation was secondary to an arthritis of the posterior intervertebral articulations. Thus, in Putti's view, sciatic pain could be satisfactorily be correlated with the associated low back disorder.

In 1929 Dandy reported that in two cases he had found cartilagenous fragments lying loose in the spinal

canal. There can be little doubt that these fragments were, in fact, extruded pieces of sequestrated nuclear tissue. In 1931 Antoni reported the first case of operated disc prolapse in Sweden.

On 30th. September, 1934, Mixter and Barr presented their historic finding that many cases of compression of the cauda equina or nerve roots by so called chondromata were, in fact, caused by a herniation of the nucleus of an intervertebral disc. They further suggested that the treatment of this condition was surgical. This view found wide spread acceptance probably partly because it was so obviously in accord with all known facts but, even more important, because the existance of these nuclear tumours was quickly confirmed by surgeons all over the world.

Mixter in 1937, maintained "that an unknown but possible small percentage of cases of intractable sciatic pain are caused by rupture into the spinal canal of a lumbar intervertebral disc".

During the next few years a spate of papers was published dealing with every aspect of the problem. The

most noteworthy were the description of the "concealed disc by Dandy in 1941 and the recognition of disc lesions as the commonest cause of low back pain unassociated with sciatica by Key in 1945 and Burns and Young in 1945 and 1947.

During the early years of disc surgery, there was a strong tendency to emphasize the significance of trauma in the development of disc herniation (Love and Walsh, 1940). However, Friberg (1941) regarded the prolapse as an expression of disc degeneration and the trauma as merely a possible, contributory factor of relatively subordinate importance. Disc degeneration was already well-known in the 1920's through the work of schmorl. Friberg and Hirsch (1950) described its pathological - anatomical development and noted a high frequency between the ages of 30 and 50 years. i.e. in age groups in which disc herniation is most common. They maintained that disc prolapse is only tail in a slow pathomorphological course. The basic aetiology of lumbar disc lesions is still unknown but we have broken away from the older and almost certainly

erroneous conception of single trauma as the dominant cause. Such factors as abnormal compression and mental stress have been suggested by Lindblom (1952) and by Scott, (1955).

More recent works has mainly been related to the mechanical, physical and biochemical properties of the discs, with special attention to the cycle of changes which occur when discs become abnormal. Charnley (1952) first drew attention to the problems associated with the fluid exchange in normal and abnormal discs, and since then further studies, notably those of Hendry (1958), have greatly clarified this phenomenon.

The chemical back ground of disc disorders has been investigated by Mitchell, et al., (1961).

The mechanical stresses to which the lower lumbar discs may be subjected have been experimentally studied by Brown et al., (1957), and Jonck (1961).

The importance of good pre-operative diagnosis is therefore obvious. In 1944 Norlen described the compression syndrome for the 4th and 5th lumbar and

1st sacral nerve roots,thereby improving the clinical diagnosis of level. There are, however, a great many cases in which several nerve roots are involved, so that myelography appears more dependable for determining the exact level. Despite this, many prefer to operate on the basis of clinical findings and to explore perhaps two or more levels rather than resort to myelography (Semmes, 1964). Other authors maintain the importance of myelography as a preoperative diagnostic procedure (Hirsch and Nachemson, 1963; Hirsch et al., 1969).

The discography introduced by Lindblom (1948) ini-- tially gave rise to a certain optimism. However, the method does not appear to be superior to myelography in the diagnosis of disc prolapse (Nordlander et al., 1958).

The potential of electromyography in the diagnosis of lumbar nerve root compression has been treated exhaustively by Knutsson, (1961), who summarized his experience as follows:"It is clear from the present investigation that electromyography is not superior to the other two methods" (i.e. the clinical - neurological and myelographic)" but that it is a good supplementary method".

The surgical treatment of sciatica has dominated ever since Mixter and Barr in 1934 establised the clinical significance of disc herniation.

Non surgical treatment, which used to previal almost exclusively has attracted much less interest science 1934. The various methods of treatment have been numerous and the results difficult to evaluate (Hakelius, 1970). Authors who have reported on conservative ma nagement include Kuhns (1941) and Boysen (1947) whose series included patients with and without neurological symptoms and Dunning (1946), Durbin (1948), Henderson (1952) and Menson (1955) whose series included only patients with neurological symptoms. Soderberg (1956) also reviewed 3,551 conservatively managed patients from different studies and found that 39 % were free of symptoms at the time of follow-up examination. The frequency of symptom-free patients varied considerably between the studies (12.5% to 79 %).