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Spontaneous Regression of the Herniated Disc about 4 Cases and Review of the Literature

Joulali Youssef- Benzagmout Mohamed- Chakour Khalid-Chaoui Mohamed El Faiz
Departement of neurosurgery, University Hospital Hassan II
Fez , Morocco
Corresponding author : Joulali Youssef

Abstract:- The herniated disc is a frequent pathology felt as disabling by the patient, with a significant socio-professional impact. The management of this pathology - apart from emergency situations - remains variable from one practitioner to another. 90% of these radicular pains respond favorably to medical treatment, without having to resort to surgery. Spontaneous regression of the herniated disc is a phenomenon described in the literature, more frequent in the lumbar region than in the cervical and dorsal regions. Inflammatory mediators are at the origin of this regression. The larger the hernia and the more it comes into contact with the epidural space, the greater the chance of spontaneous regression. In this work, we report the observation of 5 patients followed at the Hassan II Hospital of Fez, known to have a herniated disc confirmed on imaging. All our patients were put under medical treatment, and their evolution was marked by a regression of the hernia. We will analyze the results of our series in comparison with the data of the literature.

Keywords:- *Disc Herniation ; Regression ; Nucleus Pulposus ; Annulus Fibrosus ; Radiculalgia.*

I. INTRODUCTION

The herniated disc (HD) corresponds to the passage of a part of the nucleus pulposus (the pulpy nucleus of the intervertebral disc) through the annulus fibrosus (the annulus fibrosus) towards the spinal canal behind. This disc herniation is often the consequence of a degenerative involution of the intervertebral disc.

HD leads to deformation or rupture of the posterior common vertebral ligament. This leads to a reduction in the caliber of the vertebral canal or the conjugation canal, responsible for the compression of one or more nerve roots, hence the appearance of the clinical symptomatology (translation of the disco-radicular conflict) at the origin of the clinical symptomatology.

Currently and thanks to the progress of neuroimaging, we witness some cases of spontaneous regression of the herniated disc generally concomitant with an improvement of the pain

II. MATERIALS AND METHODS

Type of study

Our work is based on a systematic review of the literature. Based on a bibliographic search, we will try to describe the mechanisms involved in the spontaneous regression of herniated discs.

Patient 1 [1]:

48-year-old patient, operated in 1988 for a thyroid nodule, admitted for management of left C6 cervico-brachial neuralgia (CBN). The neurological examination showed no motor deficit with osteotendinous reflexes present and symmetrical

The standard X-ray of the cervical spine showed no abnormality, which justified the performance of a magnetic resonance imaging (MRI) which objectified a voluminous left paramedian C5-C6 HD in contact with the C6 radicular emergence. The neurosurgical indication was retained but the patient refused any surgical intervention.

The patient was put on medical treatment based on analgesics and non-steroidal anti-inflammatory drugs (NSAIDs) and muscle relaxants with immobilization with a cervical collar. The patient reported a dramatic improvement in his symptomatology. Control imaging showed regression of the HD

Patient 2

A 42-year-old female patient, with no previous history, was admitted for treatment of a left lumbosciatica of type L5. The neurological examination showed no sensory-motor deficit with a positive lasegue at 40 degrees. Imaging revealed a herniated L4-L5 disc in conflict with the left L5 root (Figure 1). The patient was put on medical treatment based on second-line analgesics, muscle relaxants, and nonsteroidal anti-inflammatory drugs for 6 weeks.

The patient started to report a significant improvement of her symptoms after 3 weeks. The patient had regular follow-up (clinical examination and imaging) and the MRI performed 2 years later showed a disappearance of the herniated disc (Figure 2).

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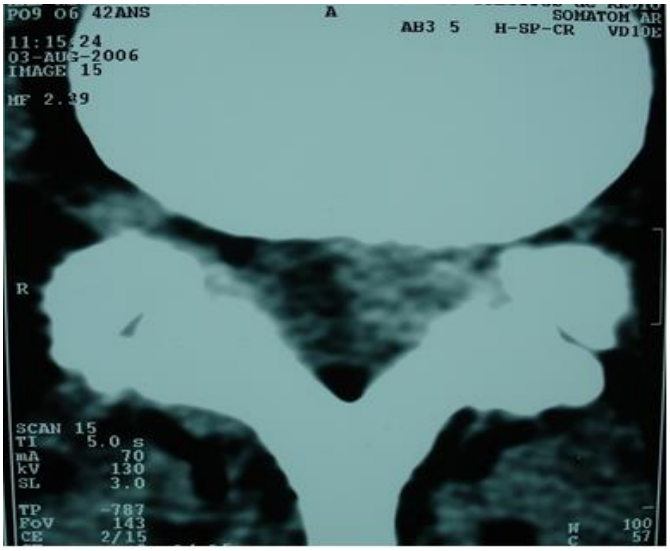

Figure 1: Large herniated L4-L5 disc in conflict with the L5 root

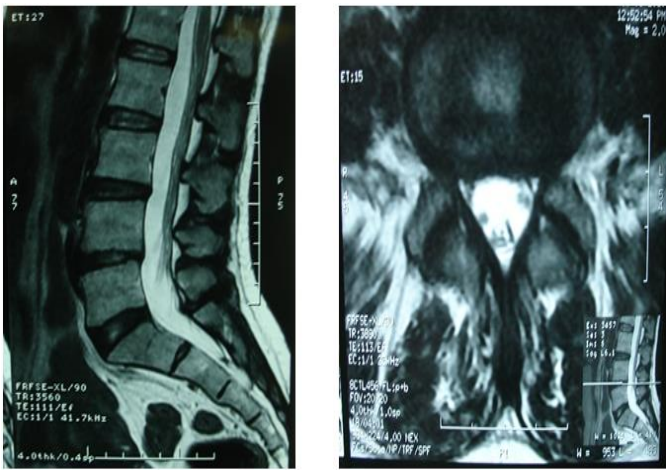
Figure 2: Control MRI showing complete resorption of the herniated disc

Patient 3:

Patient aged 50 years, with no notable pathological history, admitted for management of left L5 lumbosciatica. Clinical examination revealed a left L5 radicular syndrome with a slight deficit of the levator of the big toe at 4/5. The neuro-radiological workup revealed a large herniated left L4-L5 disc (Figure 3).

The neurosurgical indication was retained, but the patient was hesitant and preferred not to undergo surgery and to try medical treatment and rehabilitation. The evolution was marked by a spectacular improvement of his symptomatology. The patient was followed up in consultation, and 2 years later, he presented this time with hyperalgesic right L5 lumbosciatica. A control imaging was requested which showed regression of the hernia on the left side and appearance of a hernial image on the right side (figure 4). The neurosurgical indication was retained and the patient was operated with a good clinical evolution.

Patient 4

A 42-year-old female patient, with no previous history, who came to our department for management of right L5 sciatica that had been evolving for 2 months. The clinical examination revealed an obese patient, BMI 31, with right L5 sciatica, without neurological deficits.

The radiological workup had revealed a very large herniated L4 - L5 disc in conflict with the right L5 root (Figure 5 and 6). The neurosurgical indication was retained, but the patient preferred to try medical treatment with a strict diet. The patient was seen in consultation 6 months later, she had lost 20 kg, with a clear improvement of her symptomatology. A follow-up MRI was ordered, showing a spectacular resorption of her herniated disc (Figure 7 and 8).

III. DISCUSSION

Spontaneous regression of disc herniations in non-operated patients has been reported in the literature in the past, this mechanism concerns practically all spinal compartments, i.e. cervical [2], thoracic [3] and lumbar [4].

DISC DEGENERATION [5].
ROLE OF MECHANICAL CONSTRAINTS [6].

Disc degeneration and disc herniation are the two main anatomopathological entities currently identified in the pathogenesis of common lumbar pathology [7]. As the intervertebral disc (IVD) is permanently subjected to mechanical stresses, some authors have studied the role of these stresses in the genesis of disc degeneration and disc herniation.

Since 1934, when Mixter and Barr demonstrated the link between disc herniation and sciatica [8], it was taken for granted that compression of the nerve root by a herniated disc was the only pathogenic factor leading to sciatic radiculalgia; it is now accepted that the pathophysiology of radiculalgia of disc origin combines the mechanical component with "chemical" factors of inflammation [9].

Numerous studies have recently demonstrated that the herniated disc can decrease in size or even disappear spontaneously. Teplik [10] was the first to report the observation of 11 patients in whom a regression or disappearance of the herniated disc was indisputable on the second scan. Clinical improvement accompanied the morphological changes.

In 1990, Saal and Saal [11] followed the evolution of 12 patients cured by medical treatment. At the end of the treatment the patients had a second MRI scan. A resorption of 75-100% was observed in 46% of the patients, 50-75% in 36% and 0-50% in 11%. The mean interval between the two MRIs was 25 months. The complete disappearance of disc material was mainly visible in large herniations.

In 1992, several authors reported similar observations. Bozzao et al [12] followed a series of 69 patients treated medically for disc herniations of varying size and location on MRI. The mean interval between the two imaging studies was 11 months. The herniation was reduced by more than 70% in 48% of patients and by 30% to 70% in 15%. No change was observed in 29% of the patients, whereas in 8% the hernia had increased in volume. There was no significant correlation between the location of the hernia and the reduction in its size. On the other hand, the maximum resorption (70%) concerned large and medium-sized hernias.

Delauche et al [13] treated and cured 21 patients with sciatica due to disc herniation verified by CT scan. A second scan was performed about six months after the symptoms had healed. Disappearance or a strong decrease of the hernia was found in 10 patients. Moderate regression was observed in four patients. However, no change was found in the last seven patients, despite the disappearance of clinical symptoms.

Maigne et al [14] followed up 48 patients whose second scan was performed from one to 40 months after the first scan. A major regression of 75% or more was observed in 64% of patients. A decrease of 50% to 75% was observed in 17% of patients and of 25% to 30% in 19%.

The vast majority of large hernias had decreased by more than 75%. In contrast, only half of the small hernias had regressed by 75% or more.

Busch et al [15] followed 111 patients, all of whom had recovered from sciatica with conservative treatment. Eighty-four patients had a frank disc herniation, 27 others had a generalized or localized protrusion. The second scan was performed on average one year after the first scan. Sixty-four of the 84 herniations had disappeared or had greatly diminished. In contrast, only seven of the 27 protrusions had partially regressed.

In 1995, Komori et al [16] retrospectively studied 77 patients with radiculopathy due to disc herniation. All patients had at least two MRI scans during the period of conservative treatment with a mean interval of 150 days.

MECHANISMS INVOLVED IN THE RESORPTION OF THE HERNIATED DISC

Recent imaging findings have demonstrated that the herniated material may decrease or even disappear, thereby removing mechanical compression on the root. Teplik [10] was the first to report observations of spontaneous regression of herniated discs, and suggested several theoretically possible mechanisms: reduction by dehydration of the disc material; regression of the herniation through a cleft in the annulus; and the last mechanism attributed herniation regression to enzymatic degradation and phagocytosis following an inflammatory reaction [17].

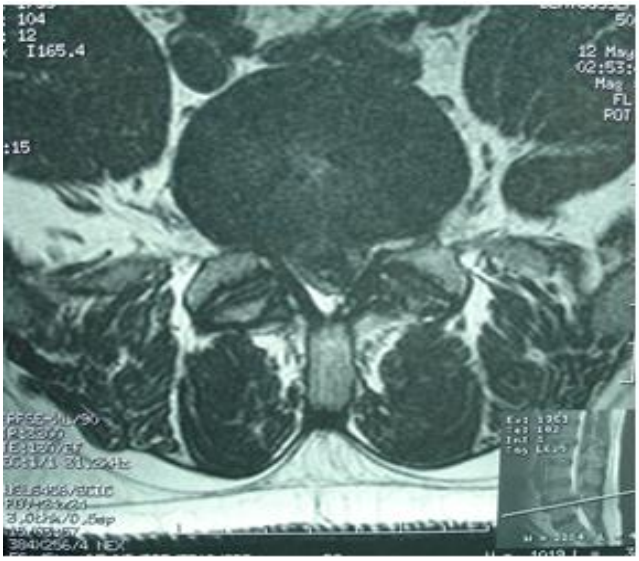

Figure 3 : T2 MRI showing a left paramedian disc herniation at the L4-L5 level

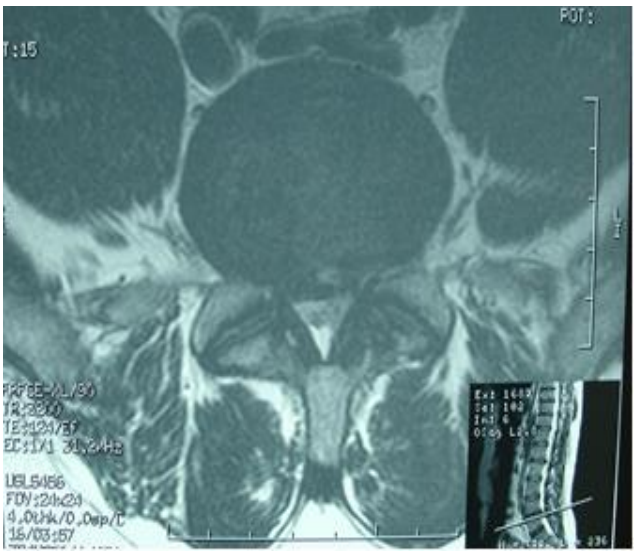

Figure 4 : T2 MRI showing regression of the herniated disc

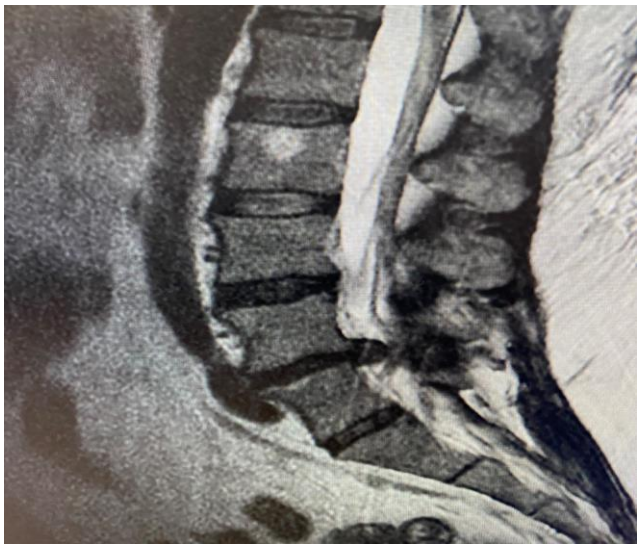

Figure 5 : MRI T2 huge HD L4-L5 (sagital)

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Figure 6 : large herniated L4 - L5 disc in conflict with the right L5 root

Figure 7 : spectacular resorption of L4-L5 herniated disc

In the case of extra-ligamentary or excluded hernias exposed in the epidural space, recent studies [18 ,19, 20] have shown that a resorption phenomenon is the mechanism involved. A recent study from the Netherlands by Djiric et al. opted instead for enzymatic degradation; in the case of excluded disc herniation, the authors were able to find a significant infiltration of macrophages which would be responsible for the disc resorption phenomenon [21]. An excluded disc herniation has a larger surface area to which macrophages can adhere, which leads to a reduction in its size.

LLP rupture had a higher chance of regression compared with herniations without LLP rupture (26% versus 9%; P <0.02) [22]. Contrast enhancement of the disc fragment implies the formation of neovascularization, and consequently an immune response.

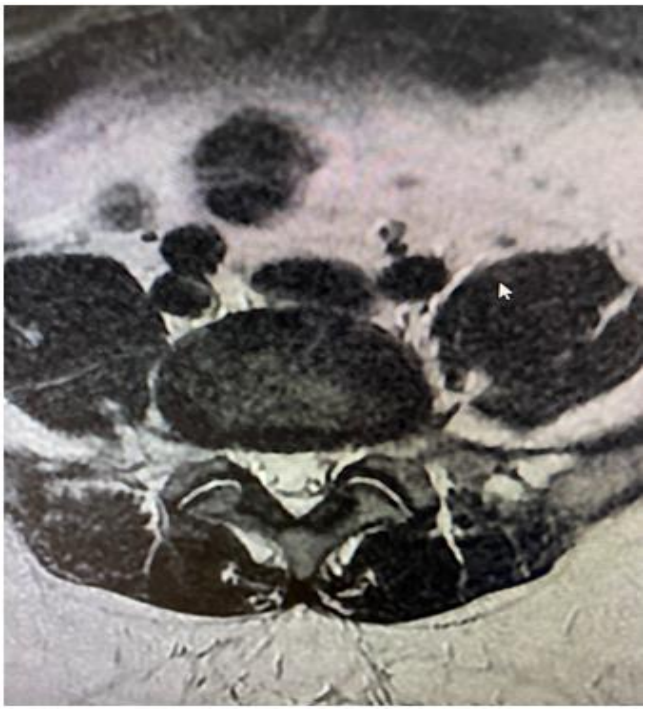

Figure 8 : axial cut showing no root compression

Autio et al. further pointed out that broad peripheral contrast uptake is a significant determinant of disc regression [23]. Takahashi et al [24] studied samples taken from sub-ligamentary herniations and showed that the majority of the cells were chondrocytes. It is interesting to note that Lindblom [25] had already fully understood this resorption phenomenon in 1950. He considered that the vascular and cellular proliferation "ate" and destroyed the disc tissue.

The intimate mechanism of destruction of the disc material has not been completely elucidated. However, it has been shown that inflammatory cytokines such as IL1, IL6, and TNF alpha are produced by macrophages in extra-ligamentary herniations and by chondrocytes in subligamentary herniations.

IV. CONCLUSION

The herniated disc is a benign pathology, its evolution is favorable in most cases. Surgical treatment should be considered only if there is a neurosurgical emergency, the size of the hernia should not influence the therapeutic decision given the possibility of spontaneous resorption of the hernia.

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