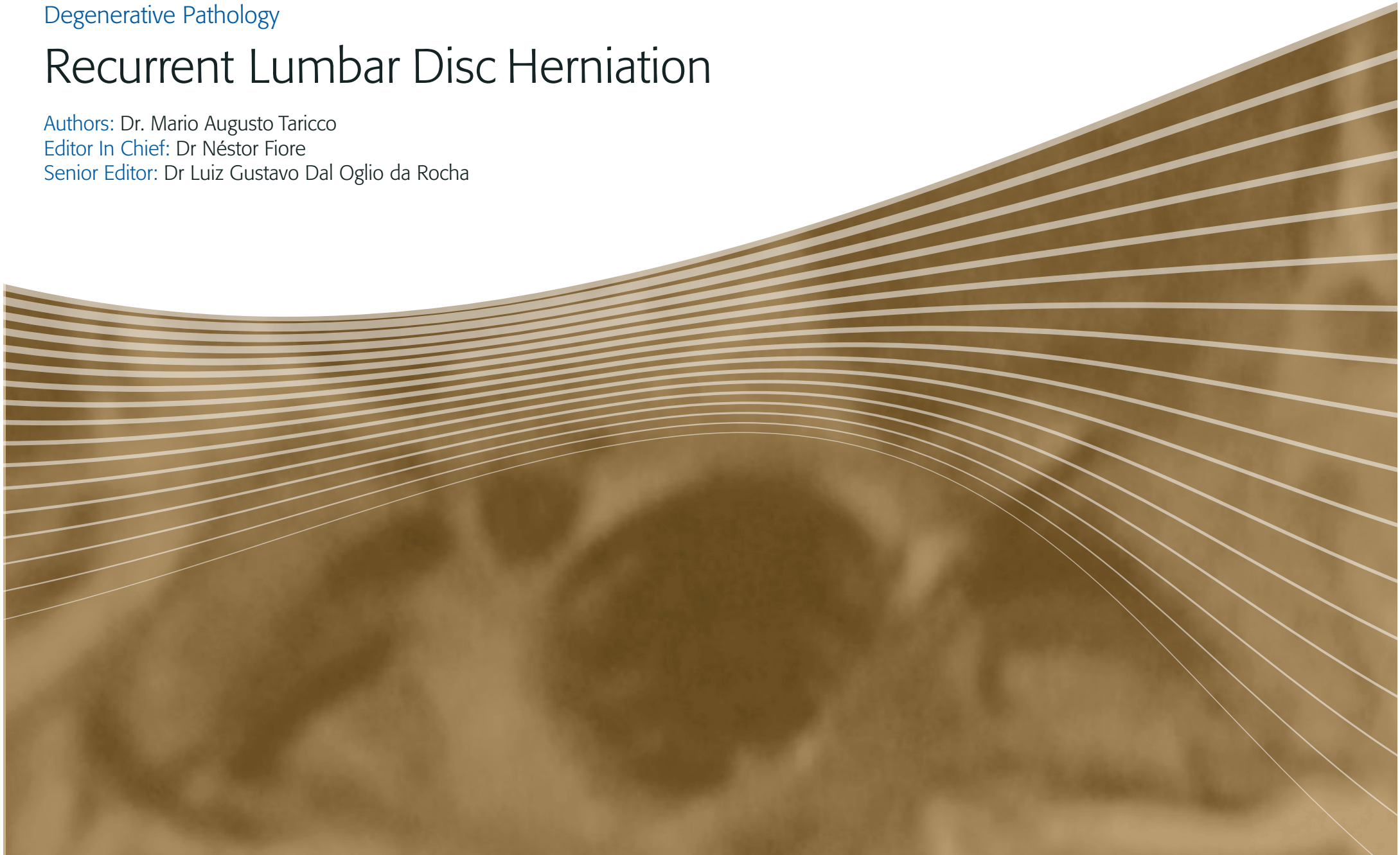


Recurrent Lumbar Disc Herniation

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OBJECTIVES

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Degenerative Pathology

Recurrent Lumbar Disc Herniation

- To describe the clinical picture of patients who present recurrent lumbar disc herniation.
- To discuss diagnostic aspects.
- To consider current treatment strategies.

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1. INTRODUCTION

Overview

The symptoms of a lumbar disc herniation have an optimal prognosis with conservative treatment. As mentioned previous section, surgical treatment is indicated in cases where conservative treatment does not improve symptoms or there is associated severe neurological compromise.

Surgical treatment normally has good results, and in most cases, the patient is able to return to the activities that were normal before onset of the symptoms. However, patients who undergo surgical treatment for lumbar disc herniation and have complete remission of the symptoms may present the same symptoms after a certain period of time. Sometimes, imaging studies of these patients show recurrence at the same level of lumbar disc herniation.

The important point is to distinguish cases such as the following: those in which surgery did not result in improvement and those that presented other symptoms after surgery.

Some studies (Fu et al., 2005; Herron, 1994) showed a significant recurrence rate of 3% to 18%. Several points regarding the concept of recurrent herniated disc require discussion.

The literature (Fu et al., 2005) contemplates a period of six months as the interval between surgery and the return of symptoms. However, there are prospective studies that reveal a recurrence rate of 10.22% with indication of revision surgery. In these cases, the return of symptoms occurred as follows:

- Symptoms returned in five patients during the fourth month after surgery
- Symptoms returned in four patients during the first year after surgery
- Symptoms returned in two patients three years after surgical treatment

Recurrent disc herniation is understood to occur when a patient has undergone surgery, the symptoms recur for a certain period of time, then they disappear, and the same radicular compression symptoms reappear due to disc herniation at the same level.

To review this subject, see the "Lumbar disc herniation" topic from Cycle 1

It should be noted that the period during which the patient has been free of the symptoms and able to perform normal activities is more important than accurately determining the time interval between the surgery and the return of the symptoms.

Another factor to take into account is that recurrent herniated disc is also considered if pain affects the opposite side of the same disc that was operated on previously.

Thus, the concept of recurrent lumbar disc herniation is well-established, and care must be taken not to confuse recurrence with poor outcomes of surgical treatment on a lumbar disc herniation. Patients with poor treatment results are those who did not show improvement of symptoms after surgery or presented other symptoms not due to nerve root compression caused by a herniated disc fragment.

Recurrence does not require the symptoms to affect the same side, but does require the same disc to be affected.

Once the possibility of recurrence is known, it is important to identify the factors that might favor it, such as technical details of the surgery that could expedite recurrence.

Certain studies (Papadopoulos et al., 2006) associate the amount of material removed from the intervertebral disc with possible recurrence: the more disc material removed, the lower the rate of recurrence. This is questioned by other studies (Suk, Lee, Moon and Kim, 2001).

On the other hand, the literature on this topic (Kim, Park and Kim, 2009) also attempts to associate the size of the tear in the annulus fibrosus with recurrence, suggesting that the rate would be higher in cases of larger injury to the annulus.

2. CLINICAL ASPECTS

Clinical Presentation

The clinical picture shows a patient who underwent surgery for lumbar disc herniation, presenting remission of radiated pain and returned to normal professional and leisure activities. After a symptom-free period, the patient presented the same symptoms as before surgery, characterized by radiated pain in the lower limb.

Complementary Tests

X-Rays

Simple x-rays should be requested when there is suspicion of post-operative instability due to the clinical picture or when there are doubts regarding the area operated on.

X-rays are not useful to confirm a diagnosis of recurrent hernia but are essential in cases where revision surgery is indicated to confirm or rule out instability.

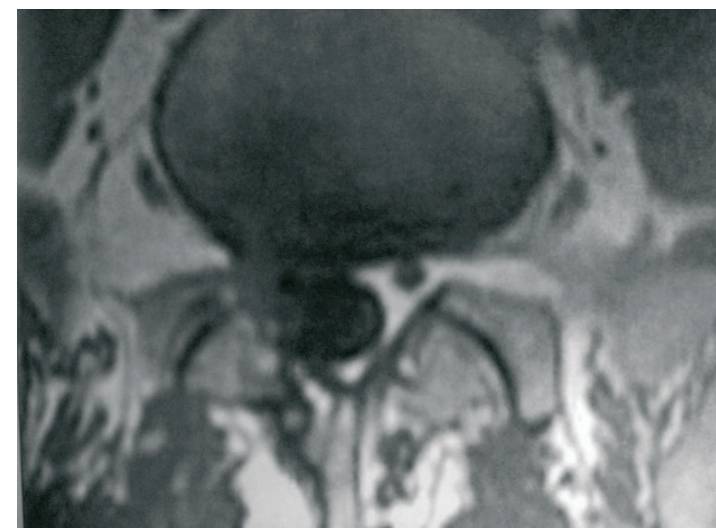
Magnetic Resonance Imaging (MRI)

Magnetic resonance (MRI) is the best imaging study to confirm the diagnosis.

As it is performed on operated patients, it is difficult to distinguish if the alterations in the image are due to surgical handling showing absence of local epidural fat and possible fibrotic scar tissue or to a recurrent hernia. To distinguish between the two, the MRI should be performed with gadolinium (Mullin, Heithoff, Gilbert and Renfrew, 2000).

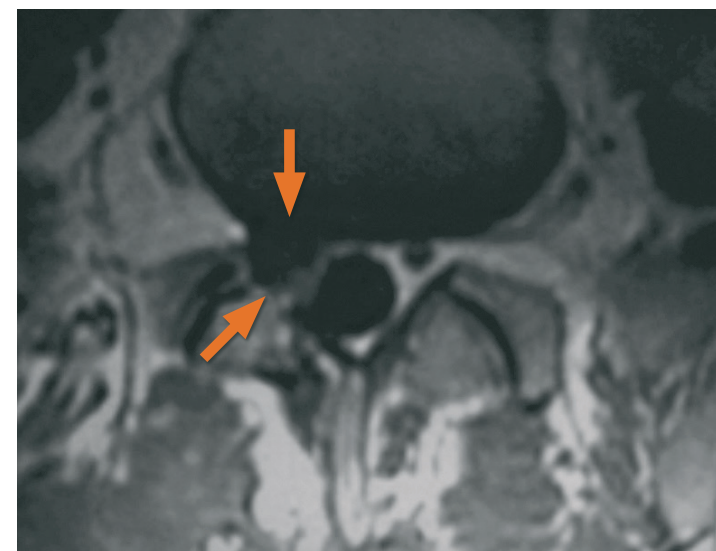
As an example, the images below show a 38-year-old patient with right side sciatica pain who underwent surgery on the right L4- L5 disc nine months before.

An MRI performed with gadolinium will achieve increased uptake due to scar tissue without altering the possible fragment of the herniated disc



Absence of epidural fat is seen in the surgical area (right).

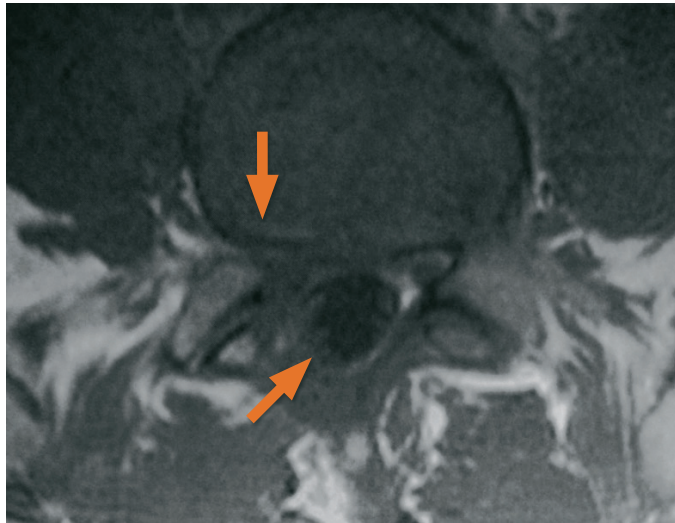
MRI without gadolinium, axial, T1-weighted sequence



Gadolinium uptake is seen around the recurrent hernia (right), that is, enhanced around the hernia.

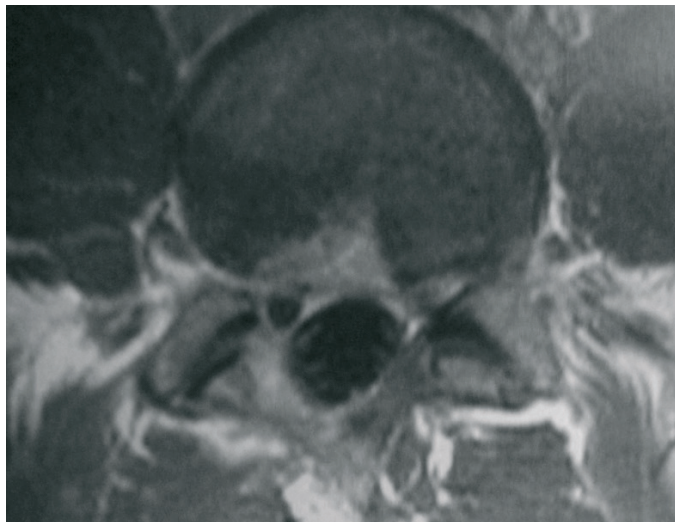
MRI with gadolinium, axial, T1-weighted sequence

As an example, the images below show a 45-year-old patient with right side sciatica pain who underwent surgery on the right L5-S1 disc eleven months before.



Absence of epidural fat is seen in the surgical area (right).

MRI without gadolinium, axial, T1-weighted sequence



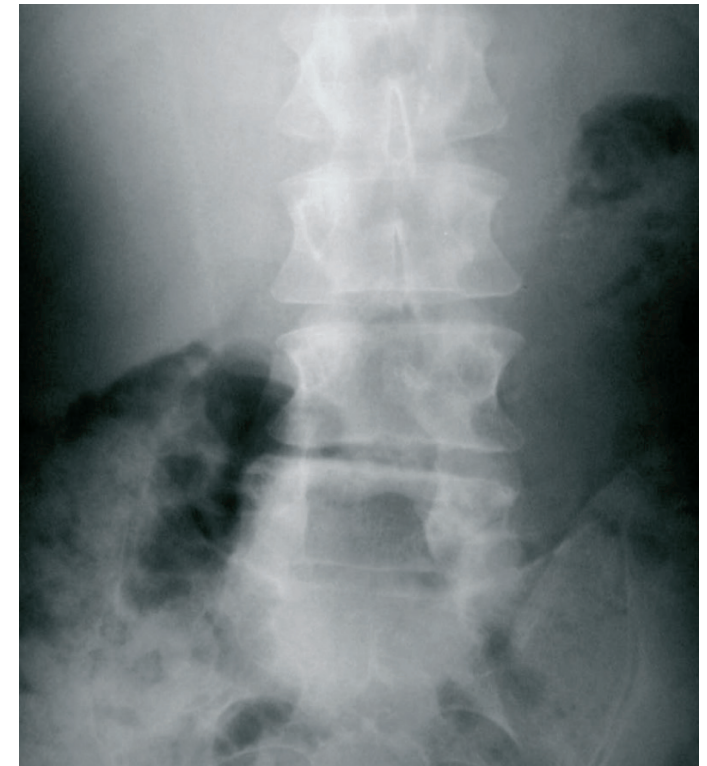
The nerve root and enhancement can be seen with the contrast in the post-operative fibrosis area (right).

MRI with gadolinium, axial, T1-weighted sequence

Myelography

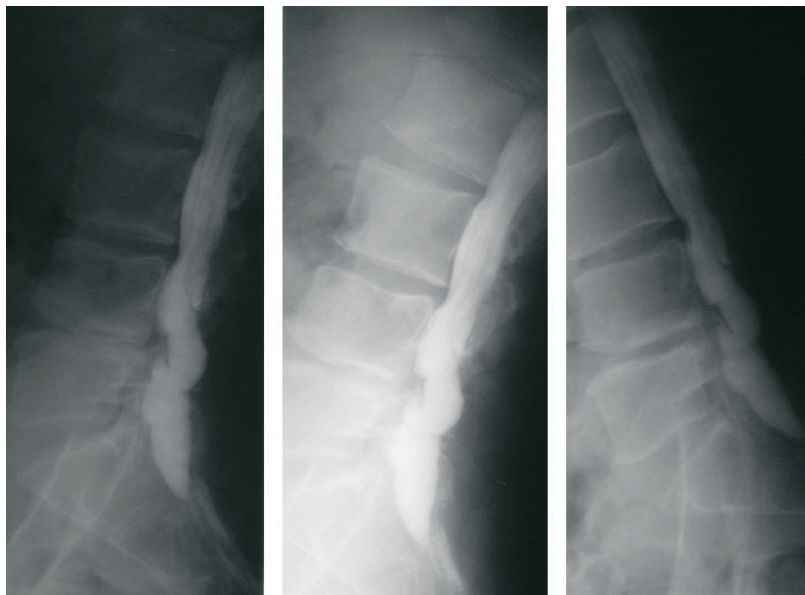
Myelography can be useful to confirm radicular compression in cases where the clinical information clearly support its presence and the MRI is not sufficiently clear to confirm the diagnosis, or in patients on whom MRI cannot be performed for some reason.

As an example, the images below show a 47-year-old male patient complains of right side sciatica who underwent surgery on the right L4-L5 disc five months before.



An area of laminectomy can be seen in L5 with resection of right articular processes.

Anterior X-ray of the lumbosacral spine



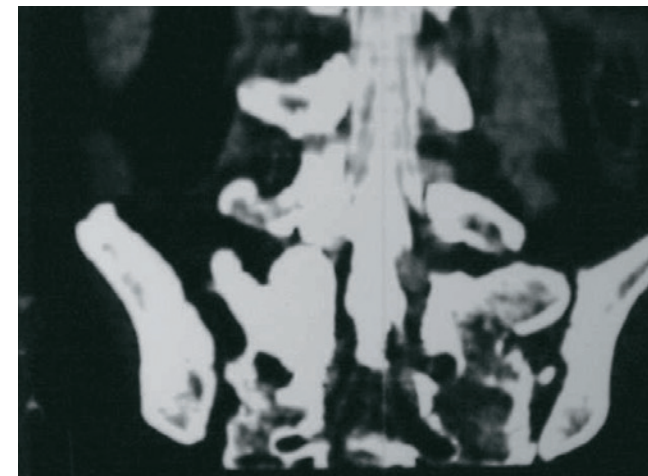
Apparent compression is seen at the L4-L5 disc level.

Lateral radiculographies and lateral radiculographies during lumbosacral spine flexion and extension

Computed Tomography (CT)

Computed tomography (CT) can be helpful to find out how much bone was removed in previous surgery and how much can be still removed without causing instability. In patients requiring revision surgery, it is necessary to detect the normal tissue, from which to move to the region manipulated during the previous surgery.

As an example, the images below show a 52-year-old patient with left side siatica who underwent surgery on the left L5-S1 disc seven months before.



Recurrent hernia is seen in the L5-S1 space on the left.

Computed tomography of the lumbosacral spine, anterior reconstruction



The laminectomy and the hernia on the left side can be seen.

Computed tomography of lumbosacral spine in L5-S1, axial view

Electroneuromyography

Electroneuromyography is indicated for the differential diagnosis of peripheral neuropathies such as diabetic neuropathy. It is not ideally indicated to confirm radicular compression or nerve root compression.

3. TREATMENT

Once the diagnosis of recurrent lumbar disc herniation is confirmed, the treatment to follow will be decided upon

Medical Treatment

The literature (Le et al., 2003; Papadopoulos et al., 2006) states that the same conservative treatment which has done before the index surgery should be performed (anti-inflammatory and analgesic medication), since it may improve symptoms, without the need for surgical intervention.

However, in most cases the patient had already undergone pain before the surgery and was relieved of the symptoms after surgery. Therefore, earlier revision surgery is requested so the patient will not have to go through the period of pain experienced before the first surgical procedure.

Blocks

Radicular blocks can be used to confirm the diagnosis for differentiate other causes of sciatica.

Surgical Treatment

In cases already decided to perform surgical treatment for recurrent disc hernia, surgeons should consider to do instrumentation and fusion for preventing future recurrences (Fu et al., 2005; Kim et al., 2009; Le et al., 2003; Papadopoulos et al., 2006).

In cases of recurrent lumbar disc herniation where there are no factors indicating instability of the compromised segment, simple radicular decompression should be performed with removal of the herniated fragment.

Selective epidural or radicular blocks can be performed to improve the symptoms, providing good permanent or transient outcomes.

CLINICAL CASE

Patient aged 42 with a history of surgical treatment of L4-L5 lumbar disc herniation 18 months previously. Four months ago, the patient presented left sciatica radiating to L5 dermatome with absence of motor or sensory deficit.



Recurrent hernia is seen at L4-L5 level.

*MRI of the lumbosacral spine,
sagittal, T2-weighted sequence*

In patients who need surgery due to recurrent lumbar disc herniation, arthrodesis should only be indicated if instability of the operated segment is confirmed.



The patient presents recurrent post-lateral left L4-L5 herniation.

MRI of the lumbosacral spine, axial in T2, T2-weighted sequence



In the image the hernia is seen invading the spinal canal but it is not captured by the contrast medium.

Post-operative MRI of the lumbosacral spine, sagittal, T1-weighted sequence



The area seen after recurrent hernia surgery.

Post-operative MRI of the lumbosacral spine, sagittal, T1-weighted sequence

The patient progresses and the clinical picture improves.

The clinical picture did not improve with conservative treatment, so it was decided to perform a new micro-discectomy on left L4-L5.

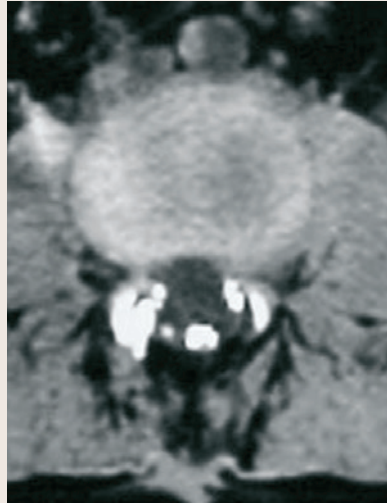
CLINICAL CASE

Patient 33 years of age with a history of surgical treatment of L3-L4 lumbar disc herniation nine months previously (left calf neuralgia). The patient currently presents a new episode of left calf neuralgia with significant lumbar pain.



The contrast fluid is seen, as well as the resection of the posterior articular processes.

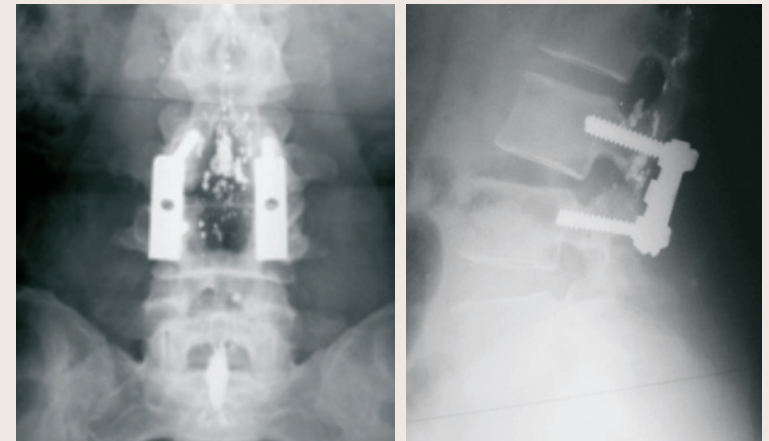
Anterior X-ray of the lumbosacral spine



The epidural contrast fluid (due to a technical error) shows the recurrent hernia in left foramen of L3-L4 and disproportionate resection of the posterior joints.

Computed tomography of the lumbosacral spine, axial view of L3-L4

Given the persistent pain, surgical treatment was decided. Since the patient was suffering from severe lumbar pain and had undergone a complete resection of articular processes, it was considered prudent to perform a new discectomy with L3-L4 fusion.



Solid L3-L4 arthrodesis can be seen.

Post-operative anterior and lateral X-ray of the lumbosacral spine

Patient presents good post-operative clinical course of lumbar and radicular pain.

The results of revision surgery of recurrent lumbar disc herniations are usually good, similar to the results of the first surgery.

The following points are important during the surgery:

- to recognize the normal anatomical limits and, from that point onward, to act on the area operated on previously
- to look out for scar tissue adhesions to the dura mater to prevent injury to the dural sac and possible subsequent progression to a cerebrospinal fluid fistula
- not to cause iatrogenic instability by removing too much bone, especially from the facet joint

TREATMENT

- The clinical picture of recurrent lumbar disc herniation has been well-established and is characterized by the reappearance of pre-operative symptoms (radiated pain) in patients who have undergone lumbar disc herniation surgery, due to a hernia in the same disc operated on previously. It is important to note that these patients were asymptomatic for a period of time after the first surgery, which allowed them to return to their professional and leisure activities.
- The best imaging study for these patients is the contrast enhanced MRI. Dynamic x-ray of the lumbar spine is recommended to rule out or confirm possible instability.
- Conservative treatment can be attempted with success. If the conservative treatment is failed in patients without segmental instability, simple radicular decompression is indicated to remove the herniated disc fragment.

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