



## Review

## Spontaneous regression of sequestered lumbar disc herniations: Literature review



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## ABSTRACT

Lumbar disc herniations (LDH) may regress with conservative management; however, this phenomenon is poorly understood for the sequestered subtype of LDH. We present one of the first comprehensive literature reviews specifically addressing the spontaneous regression of sequestered intervertebral discs. We reviewed all publications with lumbar disc herniations, sequestered subtype. Our results were then narrowed to patients who experienced spontaneous regression of the sequestration. Based on our literature review of 53 cases, patients with sequestered lumbar disc herniations experienced symptomatic resolution in a mean of  $1.33 \pm 1.34$  months and radiographic resolution in  $9.27 \pm 13.32$  months. Symptomatic patients with sequestered discs present similarly to those with other types of lumbar disc herniations. Sequestrations may have the highest likelihood to radiographically regress in the shortest time frame in comparison to the remaining subtypes of LDH. The most likely mechanism for regression is an inflammatory response elicited against the free fragment. Patients with disc sequestrations may be managed conservatively, in the absence of intractable pain, inability to walk, weakness or symptoms suggestive of cauda equina syndrome.

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## 1. Introduction

Lumbar disc herniations (LDH) are the most common cause of radicular pain, with an estimated annual incidence of 5 per 1000 adults [1]. After annular tears and degeneration, LDH are the

most common type of degenerative discogenic disease [2]. Currently, five ordinal subtypes of LDH are described in the literature: bulging discs (mildest form), focal protrusions, broad-based protrusions, extrusions, and sequestrations (severest form) (Fig. 1) [3]. The severest form of LDH is the sequestered disc. Also known as free fragments, sequestrations are no longer attached to their respective intervertebral disc [3]. Clinically, these patient present similarly to any type of LDH; therefore, differentiating between the five subtypes requires magnetic resonance imaging (MRI) for diagnostic identification [4]. According to the Spine Patient Outcomes Research Trial (SPORT), out of 2720 patients with LDH, only

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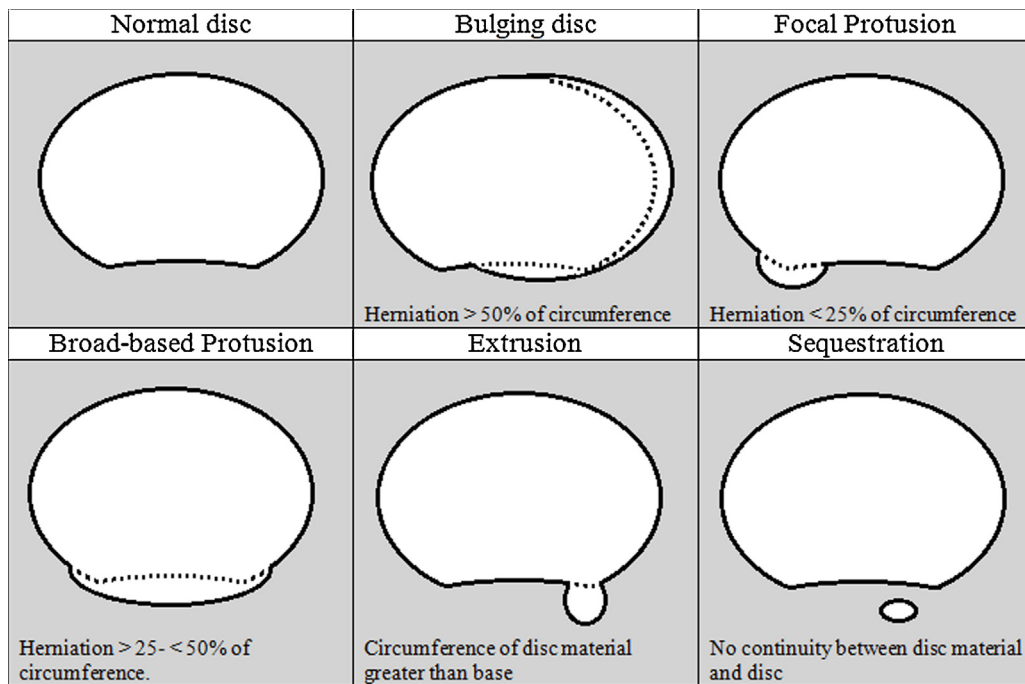


Fig. 1. Classification of the five subtypes of disc herniations in the lumbar spine.

86 (3%) patients had sequestered discs. However, patients with symptomatic sequestrations comprised 7% of all surgical candidates ( $n = 1191$ ) in the SPORT [5].

Sequestrations may undergo spontaneous regression and, eventually, complete resolution both radiographically and clinically. Verified with serial MRIs, this recently reported phenomenon has been illustrated in 52 cases (12 publications) elsewhere in the literature (Table 1) [1,6–16]. In this manuscript we present one of the first comprehensive literature reviews, in addition to a case presentation, on spontaneous regression of disc sequestrations. Our analysis focuses on the clinical, radiographic, and pathophysiological characteristics of patients undergoing spontaneous regression of disc sequestrations.

## 2. Case presentation

A 35 year-old gentleman with a seven-year history of low back pain presented to the outpatient clinic with back stiffness. Seven years prior, the patient experienced back pain after attempting to lift a heavy box. At the time, lumbar X-ray had revealed mild lumbar spondylosis, and the patient was successfully treated with physical therapy. Upon presentation, the patient complained of a one-month history of back stiffness in addition to left buttock and leg pain after a strenuous exercise maneuver at the gym. The patient expressed difficulty walking along with “severe pain”. One month after the acute symptom onset, an MRI of the lumbar spine revealed a large, left-sided L4-L5 sequestered disc fragment with rostral migration, lying behind the L4 vertebral body. The fragment compressed the thecal sac and the left L5 nerve root (Fig. 2). The patient was managed conservatively with oral non-steroidal anti-inflammatory medications.

Five months after presentation, the patient’s only complaint was back stiffness; the lower extremity symptoms had subsided. The patient denied leg pain, weakness, or bladder and bowel difficulties. Straight-leg test was negative. Muscle strength in the lower extremity muscle groups was 5/5 bilaterally. Sensation to fine touch, proprioception, and pain of the lower extremities was grossly intact bilaterally. Patellar and Achilles reflexes were 2/4

bilaterally. MRI at this time revealed complete resolution of the sequestered disc fragment (Fig. 3). The only indication of a prior lesion at the L4-L5 disc space was a focal disc extrusion superimposed on an annular disc bulge where T2 imaging suggests a small annular tear. The patient was managed conservatively with non-steroidal anti-inflammatory drugs (NSAIDs). On follow-up clinic examination 6 weeks later, the patient remained asymptomatic with the exception of some back stiffness. Motor strength, sensation, reflexes, and bowel and bladder function also remained intact.

## 3. Methods

We reviewed all published case reports and case series of lumbar disc herniations, sequestered subtypes. From this body of literature, we specifically refined our results to patients who experienced spontaneous regression of their sequestered disc. Only cases monitored with serial MRIs were included in the literature review. All cases were attributed to degenerative changes to the spinal column. Patients with infectious, metabolic, neoplastic, and/or congenital causes of lumbar disc herniations were excluded. Fifty-two cases met the inclusion and exclusion criteria for this manuscript.

Summary statistics are reported in order to describe number of cases in each publication, average age in each publication, location of sequestered disc, symptoms, physical exam findings, average time to symptom resolution in each publication, average time to MRI resolution in each publication, and residual symptoms (Table 1). For comparative purposes, relative information from the present case presentation was also included in Table 1.

## 4. Results

We carried out a literature review of 53 cases (including the present case) of spontaneous regression of sequestered discs (Table 1) [1,6–16]. On clinical examination, 37.7% of patients with sequestered discs in our literature review reported radiculopathy. Similarly on physical exam, the literature demonstrates positive straight leg tests in 41% of cases, hyporeflexia in 7.5% of cases, weakness in 41.5% of cases, and sensory disturbances in 35.8% of cases

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