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11.1 Introduction

Stenosis due to lumbar degenerative disease is a common condition associated with the aging process that can eventually cause compression of the neural elements in the lumbar canal [1]. Although lumbar stenosis does not always become symptomatic, symptoms may vary from focal pain to sciatica and neurogenic claudication [2]. When conservative therapy fails, decompression surgery is required for treatment and alleviation of the symptoms. Wide laminectomy, once a the standard approach for stenosis cases, has steadily been giving ground to more minimal procedures, such as fenestration and undercutting, that provide decompression while preserving bone structures and reduce morbidity and iatrogenic complications [3].

During the last two decades, a lot of spine surgeons became more familiar with instrumentation techniques and materials and subsequently increased the use of both for the treatment of lumbar degenerative disease/stenosis. Performing fixation with screws and rods at various lengths became a widely popular tool among spine sur-

geons and can now be even considered among the basic techniques of the craft [4].

Recent articles have attempted to limit the potential use of fusion materials, investigating outcomes and complications related to this practice and trying to set more concrete indications for the implementation of instrumentation [5].

Nowadays, an ongoing discussion, one where expert opinions clash more often than not, is held regarding the optimal treatment of patients with lumbar stenosis. Although this discussion is considered yet unresolved, accumulated experience and recent evidence can help drawing solid conclusions in many cases [6].

With this case, we would like to illustrate an overview of such important decision-making problems when treating lumbar stenosis. Those pertain to several questions on decompression, implementation of fusion/stabilization (or not) and the type thereof, as well as the indications of each approach. Regarding decompression one should always consider the benefits and drawbacks of each type (undercutting in our case), the need for discectomy and the absolute requirement to avoid causing further instability.

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11.2 Case Description

Our case regards an 83-yo female patient, complaining of neurological claudication for 12 months who presented to our department with severe bilateral

paralysis of L5 nerve roots since four weeks. Muscle strength of extensor hallucis longus and tibialis anterior was examined at 3/5 bilaterally while no sensory deficit was present. She was investigated with flexion-extension lumbar x-rays (Fig. 11.1) and an lumbar spine MRI scan (Fig. 11.2). The imaging revealed lumbar degenerative disease causing severe stenosis at the L4-L5 due to hypertrophy of the ligamentum flavum and mild bulging of the disc at the L5-S1 level (Fig. 11.2). The imaging also revealed 1st degree olisthesis at the level L4-L5 that remained unchanged in flexion and extension x-rays (Fig. 11.1).

The patient was operated using an undercutting technique and bilateral flavectomy at the level L4-L5 without performing short-segmental fusion. No disc material fragments were found so no discectomy was performed either. Immediately post-operatively the patient presented an almost complete neurological recovery. Examination of the affected muscles revealed a muscle strength of 4/5 at the left side and 5/5 at the right side. At the routine post-op x-ray no further olisthesis was detected (Fig. 11.3).

11.3 Discussion of the Case

Severe motor weakness is an uncommon symptom of lumbar stenosis [7, 8]. Our decision for treatment was based on the following factors: (a) the patient's advanced age (83 y.o.) and osteoporosis, (b) the low degree of olisthesis that remained unchanged in flexion and extension x-ray imaging. Relevant literature has demonstrated that in older patients decompression while preserving facets, without fusion, minimizes the risk of postoperative instability and slip progression and also reduces morbidity associated with instrumentation.

Less invasive techniques are preferred over laminectomy since they are usually successful in adequately decompressing the neural elements that are stenosed due to hypertrophy of the ligamentum flavum and joint facets. Along these lines, undercutting technique has been shown to produce sufficient decompression and facet preservation. Moreover, although stenosis is evident of segmental instability [9], the extensive degenerative process itself has been shown to prevent

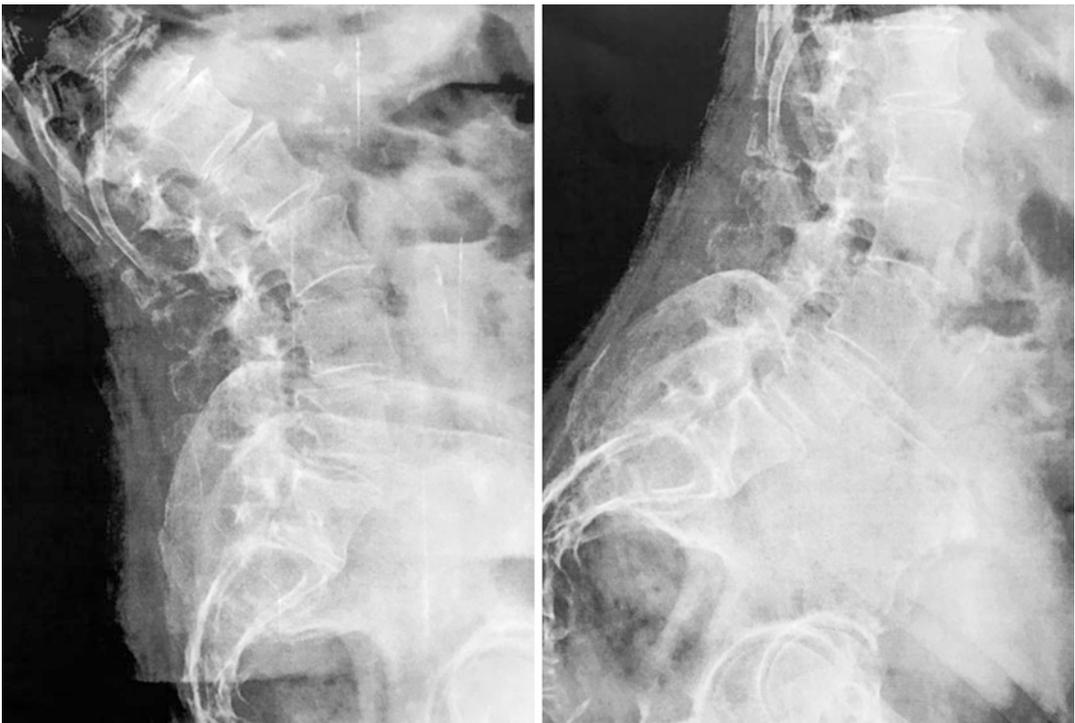


Fig. 11.1 Pre-op flexion-extension lumbar x-rays



Fig. 11.2 Pre-op lumbar MRI imaging

progression of instability (increasingolisthesis in flexion/extension). Therefore, routine use of instrumentation, that is associated with moderate risk of added morbidity, does not always provide benefits over decompression alone and should not be performed without evidence of definite need for stabilization. Instead, recent literature suggests that the need for fusion should be evaluated on a case by case basis, taking into account manifestations of instability (serious spondyloolisthesis, disruption of sagittal balance, pathological hypermobility) and individual patient differences and needs [10]. Thomé et al. [9] suggested a treatment algorithm for lumbar spinal stenosis that as a first general rule acknowledges indication for surgery in consistent clinical and radiological findings after three months of adequate conservative therapeutic treatment. Moreover, existing evidence-based clinical guidelines should be applied into clinical prac-

tice as they are helpful, and often mandatory, tools that help spine surgeons provide the best available treatment to lumbar spinal stenosis patients [10].

11.4 Conclusions and Take Home Message

- In patients with spinal stenosis and severe neurological deficits an adequate decompression is recommended.
- Undercutting provides excellent decompression without aggravating instability in most cases.
- If there is no disc protrusion no discectomy is necessary.
- If there is no severe instability in flexion-extension plain radiograph, fusion can be avoided initially in most patients.

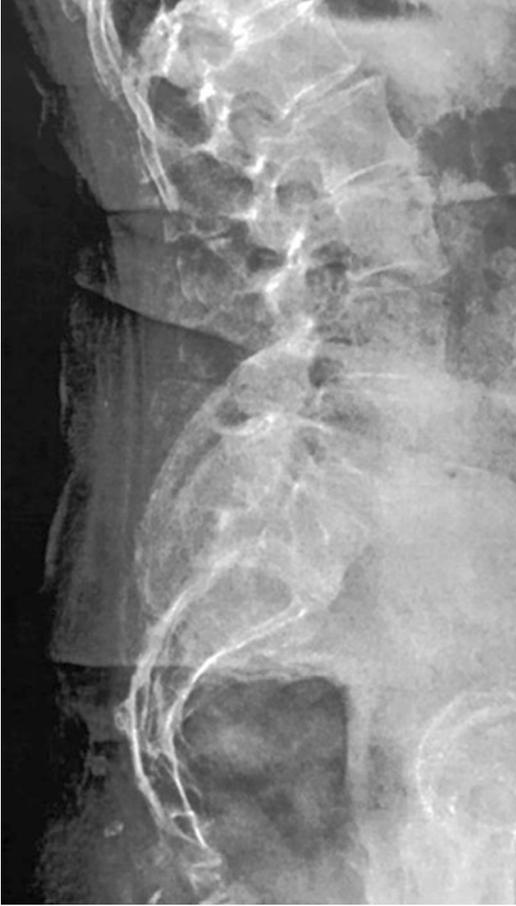


Fig. 11.3 Post-op lumbar x-ray

Pearls

- Stenosis in imaging and clinical findings should match
- Routine fusion should be avoided
- Decompression should not cause instability
- Preserve facets, consider undercutting technique

Editorial Comment

This chapter complements the arguments used in chapter 10. The principle “if in doubt, do less” was applied here and no fusion used. The question whether a less invasive decompression technique truly

reduces the incidence of symptomatic iatrogenic instabilities is somewhat questioned by the editors, although it is often propagated by “experts”. Nevertheless, unilateral laminotomy and undercutting is considered the best standard by us in the year 2019.

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