



# A Case of Multilevel Lumbar Stenosis with Initial Mild Instability: A New Interspinous/Interlaminar and Facet Joint Arthrodesis System

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## Abstract

In the last decades, pedicle screws or facet screws have been the most used instruments for vertebral fusion. However, both of them present intraoperative risks and require intraoperative fluoroscopy. Herein we present this new arthrodesis system, formed by two different components (Interspinous/Interlaminar and facet joint fixation: Ischia and Filicudi\*) which ensure maximal stability and promote biological fusion permitting a bone-to-bone contact.

A 77-year-old lady suffered bilateral (right > left) neurogenic claudication and walking distance <50 meters. The MRI showed a mild L5/S1 listhesis (with instability confirmed at the dynamic X-rays) and a L4/L5 stenosis. A soft elements decompression was performed and interspinous/interlaminar arthrodesis was placed alone at L4/L5 and associated with facet joint arthrodesis system at L5/S1, without complications. At the 2-year follow-up the patient was pain free and able to work for 3 km.

This Interspinous/Interlaminar and facet joints implant associated with bone grafting provided a complete vertebral fusion: We believe that this device, for selected cases, could be the right option especially for the minimally invasive surgical procedure that requires, the very low risk of morbidity and the high grade of patient satisfaction.

**Keywords:** Posterior lumbar arthrodesis; Interspinous/interlaminar; Facet joint; lumbar stenosis; Neurogenic claudication; Lumbar instability

## Introduction

In the last decades, pedicle screws or facet screws have been the most used instruments for vertebral fusion. However, both of them present intraoperative risks, due to the proximity to nerve roots and vascular structures. Furthermore C-arm fluoroscopy is required to ensure proper screws placement, exposing patients and surgical team to radiations [1]. In selected cases, implantation of interspinous/interlaminar and facet joints arthrodesis system has shown an efficacy comparable with pedicle screws with fewer risks. Herein we present this new arthrodesis system (Ischia and Filicudi\*). This system is formed by two different components (Interspinous/Interlaminar and facet Joint fixation) which ensure maximal stability and promote biological fusion permitting a bone-to-bone contact.

## Case Presentation

A 77-year-old woman initially presented light and fluctuating low back pain and bilateral foot paresthesia. Three months later bilateral (right > left) sciatica appeared during walking. At moment of the consultation the woman was not able to walk more than 50 meters e she was pain free only in sitting or lying position. The MRI showed a mild L5/S1 listhesis and a L4/L5 stenosis. On the dynamic lumbar X-Ray was evident a lumbarization of S1 and the instability of the segment L5/S1. Hence, soft elements decompression [3] and interspinous/interlaminar arthrodesis was placed alone at L4/L5 and associated with facet joint arthrodesis system at L5/S1 [2,3]. No intra or postoperative complications occurred. The patient wore a lumbar brace for 6 weeks and started with the physical rehabilitation. At the 2-year follow-up she was completely pain free and able to walk for 3 km.

## Discussion

Significant improvements following this simple type of surgery were observed in this patient.

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In recent decade's microscopic lumbar decompression have become an alternative to laminectomy, associated or not with spinal fusion, for the treatment of lumbar stenosis with or without listhesis [4]. The indications of this type of system are the necessity to perform, in case of lumbar degenerative disc disease, an arthrodesis with any instability or with a mild (no more 4 or 5 mm slipping) spondylolisthesis [5]. On the other hand, the possibility of vertebral slipping after a decompression without arthrodesis is reported [6]. Which lead to worst clinical outcome and re-operation [7]. This system, could overcome this complication, permitting to obtain fusion without the need of pedicle screws. Furthermore, looking at the biomechanics of the lumbar column, this posterior system transfers the load, which is the primary cause of spine degeneration, from anterior to posterior column (especially over the facets joints) [8]. Finally, this instrumentation Titanium scaffold that is filled with bone chips: This bone-to-bone contact promotes biological fusion permitting a real arthrodesis. This fusion is demonstrated by the dynamic lumbar X-ray 2 year's follow-up and by the 3D reconstruction of lumbar CT scan.

## Conclusion

This Interspinous/Interlaminar and facet joints implant associated with bone grafting provided a complete vertebral fusion in this patient with Grade I listhesis. At the 2-year follow-up the patient, who preoperative had chronic back pain and a severe neurogenic claudication, exhibited significant improvement. We believe that this device, for selected cases, could be the right option especially for the minimally invasive surgical procedure that requires the very low risk of morbidity and the high grade of patient satisfaction.

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