

## Surgical Treatment of Lumbar Degenerative Spinal Diseases in Osteoporotic Patients with Expandable Pedicle Screw Fixation: A Comparative Study

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#### Introduction

The incidence of screw loosening increases significantly in patients with severe osteoporosis. Biomechanical tests have shown that a pedicle screw that expands within the vertebrae body can substantially improve fixation in the presence of compromised bone. This prospective mixed cohort study was designed to evaluate the middle- to long-term purchase of expandable pedicular screws in patients with poor bone quality.

#### Methods

Thirty consecutive ostoporotic patients with degenerative spinal diseases (listhesis, stenosis, FBSS) received posterior lumbar spinal fusion. In fifteen cases the spinal fixation was performed using titanium expandable screws with standard titanium rods (Osseoscrew, Scient'x-Alphatec); in fifteen cases the patients performed a posterior fusion using standard titanium pedicle screws. Pre-operative DEXA BMD examination showed a mean Tscore of -3.1. Patients were observed for a minimum of 24 months. Outcome measures included screw loosening, Visual Analogue Scale, Oswestry Disability Index, and complications.

Twenty-four months after surgery, the VAS and ODI were markedly improved in all the cases. There were three cases of CSF leakage in patients with severe stenosis and FBSS, not related to the device, which healed after corresponding treatment. At 12 and 24 months follow-up, there were no instances of screw loosening or pull-out of the expandable screws, and the screw-bone interface was good. On plain radiographs and spinal CT, there were no signs of radiolucency around the pedicle screws. Dynamic x-rays, revealed non-motion of the screws and no movement between the fused vertebral segments. Expandable screw breakage did not occur in any patients. In patients with standard titanium pedicle screw fixation, there were two cases of screw loosening after 12 months f.u..Implant failure did not occur in any study patients.

#### Conclusions

Results

Expandable pedicle screws can decrease the risk of screw loosening and achieve better fixation strength and clinical results preventing screw pull-out in osteoporotic lumbar spinal fusion.

### L4-L5 lumbar stenosis in osteoporotic patient



References

Titanium Expandable Pedicle Screw for the Treatment of Degenerative and Traumatic Spinal Diseases in Osteoporotic Patients: Preliminary Experience. Gazzeri R, Roperto R, Fiore C. Surg Technol Int. 2012 Sep 1;XXII. doi:pii: sti22/10.

# Posterior open fixation with expandable



Axialo CT image showing expansion of the screw in the vertebral body



#### **Learning Objectives**

By the conclusion of this session, the partecipants should be able to describe the importance of expandable pedicle screws in decreasing the risk of screw loosening, achieving better fixation strength in osteoporotic spinal fusion.