

Percutaneous VS open expandable pedicle screws fixation in the treatment of vertebral osteoporotic

fracture. Comparative clinical and radiological study.

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Introduction

Management of adult spinal fractures in osteoporotic patients poses great challenges to the spine surgeon and has historically been associated with relatively high rates of complications and need for reoperation. The incidence of screw loosening increases significantly in elderly patients with severe osteoporosis. In our study, we compared the effectiveness and safety of percutaneous minimally invasive versus open spine surgery for thoracolumbar fractures in osteoporotic patients.

Methods

24 Consecutive osteoporotic patients with posterior fixation using expandable pedicle screws after thoracolumbar spinal fractures were included in the study. Patients were divided in two groups: Group I, treated with percutaneous expandable screws; Group II, patients treated with expandable pedicle screws in open approach. Preoperative DEXA BMD examination showed a mean T-Score of -2.9. Patients were observed for a minimum of 2 years. Outcome measures included postoperative incisional pain Visual Analogue Scale, Oswestry Disability Index and radiological screw loosening. Surgical blood loss, postoperative blood loss, surgical time and length of hospital stay were recorded.

Results

With the exception of osteoporotic status, there were no significant differences in the baseline status between the two groups. In Group I (percutaneous MIS) 10 patients were treated, while 14 patients were included in Group II (open). Postoperative length of hospital stay was shorter in Group I patients (mean 4.3 days) than in Group II cases (mean 6.4 days). Percutaneous MIS was better than open surgery with respect to surgical blood loss, postoperative blood loss, and surgical time. Patients treated with percutaneous techniques had a shorter length of hospital stay. Postoperative incisional pain was less in patients undergoing percutaneous MIS. At 1 and 2 years follow up, the VAS and ODI was markedly improved in the two groups With no statistical differences between the two groups. At 12 and 24 months radiological follow up there were no instances of screw loosening or pull-out, and the screw-bone interface was good in both groups. Dynamic X-rays revealed nonmotion of the screws in the osteoporotic vertebrae.

Percutaneous Expandable screws fixation



Conclusions

Expandable pedicle screws can decrease the risk of screw loosening and achieve a better fixation strength and clinical results in osteoporotic spinal fusion. Percutaneous spinal fixation achieves a faster pain improvement, minor postoperative blood loss and a shorter surgical time and postoperative length of stay in hospital compared to open approach. These favorable outcomes are particularly important in specific subgroups of patients, including osteoporotic elderly people and patients with important comorbidities, making the percutaneous minimally invasive technique the preferable surgical option. Among potential disadvantages of percutaneous technique, spinal fusion has to be considered.

Learning Objectives

By the conclusion of this session, partecipants should be able to choose the most convenient and safe procedure to treat osteoporotic vertebral fracture

Osseoscrew-Illico percutaneous screws (Alphatec Spine) expanded at S1



References

Gazzeri R, Roperto R, Fiore C.Titanium expandable pedicle screw for the treatment of degenerative and traumatic spinal diseases in osteoporotic patients: preliminary experience.Surg Technol Int. 2012 Dec;22:320-5.