Cement Augmentation of Sacroiliac Screws in Fragility Fractures of the Pelvic Ring

A Systematic Review of the Current Literature

Introduction

- With the increase of life expectancy, growing incidence of osteoporotic pelvic ring fractures (up to 450 per 100 000 persons per year) in patients older than 85 years is noted.
- In 2013 Rommens et al (1) described a classification for fragility fractures of the pelvis (FFP). Most common are FFP Type IIb and IIc with up to 50%, both involving sacral fractures. Nevertheless, there is no clear evidence and no consensus on the treatment of Type II lesions.
- So far, sacroplasty or percutaneous screw fixation are the most common surgical procedures for fixation of sacral fractures.
- Combination of both methods, cement augmentation of percutaneously placed SI-screws, is still uncommon. Cement augmentation is an already established procedure in femoral neck or vertebral fractures and provides higher pull-out force in osteoporotic cancellous bone.
- Aim of this study: systematic review of the current literature concerning studies comparing augmented versus non-augmented SI-screws.

Methods, Results

- Pubmed-search: osteopor* and plevi*
publication date of the study after 01/01/2000
- Eligible designs: randomized trial, a case series with more than three patients, a biomechanical study or a review
- 747 primary hits, finally 7 studies included

Conclusion

- Percutaneous SI screw placement is a safe and well established fixation technique of the posterior pelvic ring. So far, case series demonstrate no major complications by adding cement augmentation (2-4).
- Biomechanical studies show a significant improvement of sacral screw fixation by cement augmentation (5-7).
- Prospective randomized controlled clinical trials to show the superiority of fixation of FFP with cement augmented SI screws are pending

Discussion

- Osteoporotic pelvic ring fractures occur frequently, still the fixation technique using SI screws and cement augmentation is not common
- Key argument to augment SI screws is to optimize implant-bone interface and thereby reducing the risk of screw loosening or pull-out, which in clinical practice means immediate full weight-bearing mobilization.
- Biomechanical studies comparing pull-out forces and testing axial loading fail to represent the actual mechanical forces working in an osteoporotic pelvis after surgical fixation (8).

References