

HOW MUCH CEMENT IS NECESSARY FOR VERTEBRAL BODY AUGMENTATION FOLLOWING SpineJack®?

RESULTS FROM A BIOMECHANICAL IN VITRO INVESTIGATION FOCUSING ON THE CEMENT VOLUME

Introduction

The standard minimal invasive treatment of vertebral fractures is basically characterized by cement augmentation. Disadvantages of this technique are changes in the coefficient of elasticity, the increase of complication risks due to leakage and loss of restored height. The ideal technique should therefore implement :

- **maximum fracture reposition**
- **preservation of intraoperative reposition**
- **minimum injected cement**

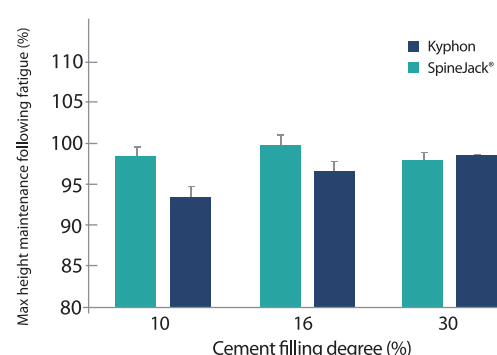
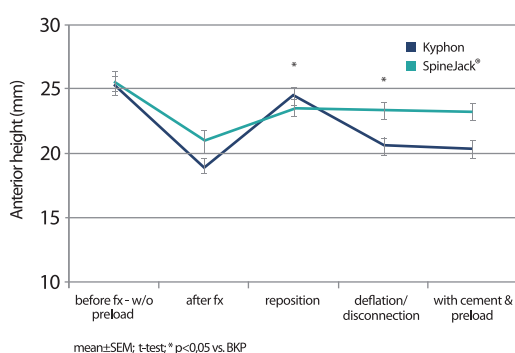


Biomechanical Study

- 36 fresh frozen human male vertebrae (8 columns T11-L3)
- non osteoporotic bone
- initial wedge fracture creation > 40 % height reduction
- reposition by SpineJack® 5.0 (SJ) vs. KyphX Xpander® 20/3 (BKP)
- injection of different bone cement volume (10, 16 or 30 [Vol. %]) of vertebral body
- injection tests under constant preload of 100N
- cyclic axial test (10000 cycles/1Hz (200-600 N)) and static axial test to failure

Results:

- significant height loss after reposition following balloon deflation by BKP (20%)
- SpineJack® preserves the initial height gain (4% height loss)
- increased subsidence in 10 and 16 % groups by BKP following fatigue test
- no influence of cement volume in SpineJack® groups following fatigue test



Conclusion_ The main result of this study was a significantly better height restoration (lower height loss) with SJ compared to BKP during reposition after balloon deflation/disconnection of guide handle. A cement amount of 10% of the vertebral body volume is sufficient for the augmentation using SJ. More cement does not increase stability of the vertebra. Additionally, it is impossible to reduce the amount of cement when using BKP without impacting negatively the height restoration.