Time from Discovery to Procedure Impacts Pain Reduction but not Radiographic Correction for SpineJack Treatment of Vertebral Compression Fractures

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Neurosurgery

Introduction

- Vertebral compression fractures (VCFs) are associated with a significant burden of pain, functional loss, and associated cost.
- SpineJack is a novel device aimed at restoring lost vertebral height in this population.

Objective

This study sought to elucidate the effect of time from fracture discovery to procedure on radiographic and clinical outcome in SpineJack procedures.

Methods

- Retrospective review of patients undergoing SpineJack thoracolumbar fracture correction 2/2021 – 9/2022.

- Analysis using Fisher's exact tests for categorical, Spearman's rank correlation, and Mann-Whitney U tests.

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Pain Scores at Follow Up vs Time to Correction

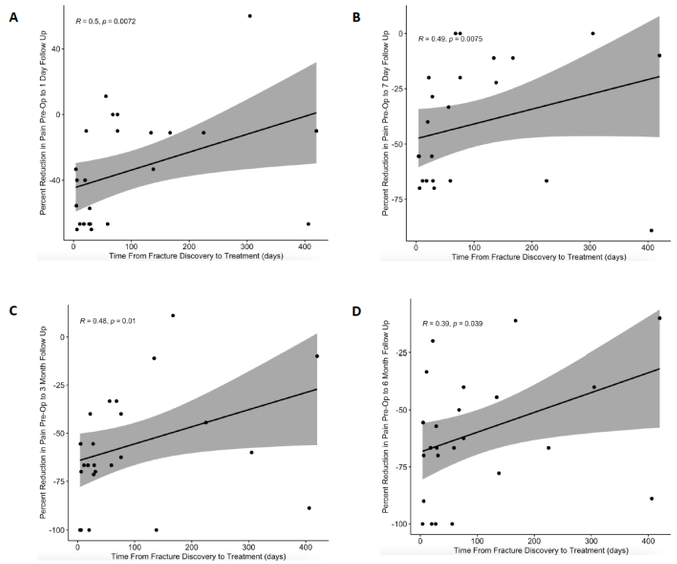

Figure 1: Pain Scores Post-Op **A.** Day 1 **B.** Day 7 **C.** Day 90 **D.** Day 180

Radiographic Correction vs Time to Correction

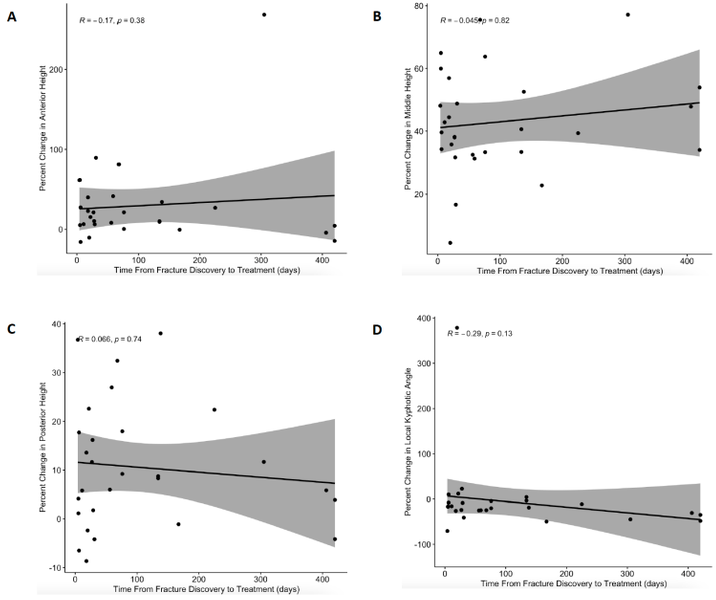

Figure 2: Percent Radiographic Correction **A.** Anterior **B.** Middle **C.** Posterior **D.** Kyphotic Angle

Results

Table 1: Baseline Demographic and Fracture Characteristics of Study Cohort Patients (N=23)

Variable	Study cohort (N=23)
Age (Mean ± SD)	74 ± 12
Sex, N (%)	
Female	18 (78.3)
Male	5 (21.7)
Race, N (%)	
White	22 (95.7)
Asian	1 (4.3)
Ethnicity, N (%)	
Non-Hispanic or Latino	23 (100)
Medical History (Mean ± SD)	
Previous Fractures	1.2 ± 1.4
Medical Comorbidities	1.2 ± 1.3
Prior Related Surgery, N (%)	
Yes	9 (39.1)
No	14 (60.9)

- 28 fractures from 23 patients were included (78% female, median age 74)
- Most common mechanism of injury was fall (59%) and level was L1 (36%)
- There was significant improvement in anterior compression, posterior compression and local kyphotic angle following SpineJack procedures compared to baseline.
- At no time point after fracture discovery did waiting time impact degree of vertebral compression fracture correction ($p > 0.05$)
- Re-operation, discharge disposition, and adjacent fracture frequency were not impacted by waiting.
- Less time from discovery to surgery was associated with significant pain reduction at day 1, day 7, day 90 and day 180.
- Degree of correction did not correlate with pain improvement.

Conclusions

- This study demonstrates a significant pain benefit to the use of SpineJack in treating thoracolumbar fractures earlier, while there does not seem to be an association between the degree of correction and fracture age.

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