

Introduction

- Successful bony fusion after transforaminal lumbar interbody fusion (TLIF) is impacted by the biomechanical properties of the interbody devices used.
- Typically interbody cages are primarily made of polyetheretherketone (PEEK) or titanium (Ti).
- Ti cages may offer improved fusion rates yet may have increased rates of subsidence versus PEEK cages.
- Purpose: To compare 2-year clinical and radiological outcomes of PEEK versus Ti cages in patients undergoing TLIF.

Methods

- A retrospective review was performed at a single institution to identify all patients between 2013-2018 who underwent open or minimally invasive (MI) TLIF and received either a Ti or PEEK cage with a minimum follow-up of 2 years.
- Revision rates, time to revision, graft subsidence and fusion rates in each group were compared.
- Graft subsidence was defined as cage migration into one vertebral endplate >3mm on plain radiographic measurement. Fusion was defined as visible trabeculation and bony bridging between adjacent endplates.
- Functional outcomes were assessed by comparing pre- and post-operative patient reported VAS-back, VAS-leg and ODI scores.

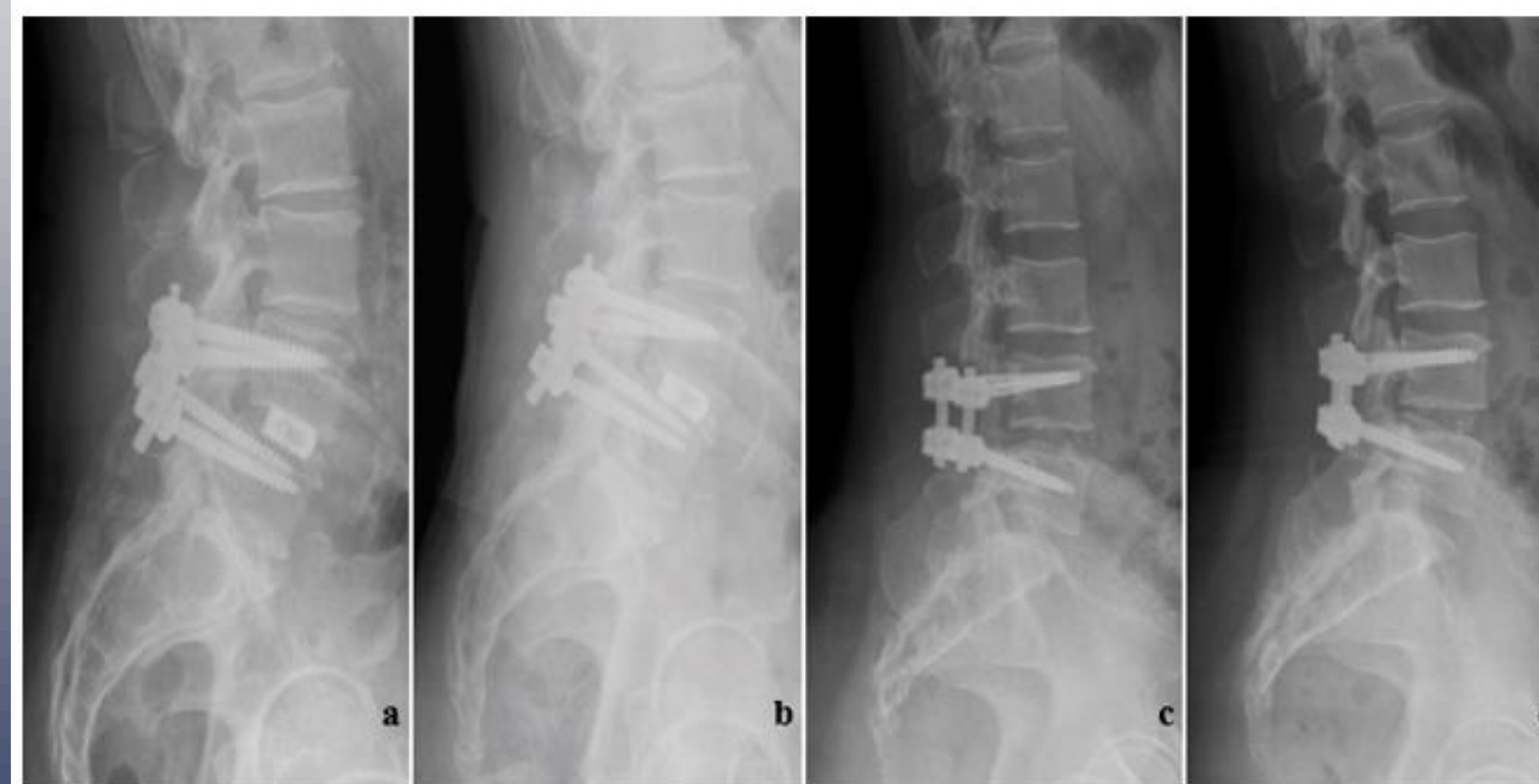
Table 1. Graft Subsidence Rates

Parameters	PEEK	Titanium	p-value
Subsidence Rate (%)			
3-m Post-O	5/183 (2.7%)	4/137 (2.9%)	0.292
6-m Post-O	10/183 (5.5%)	7/137 (5.1%)	0.122
12-m Post-O	14/183 (7.7%)	9/137 (6.6%)	0.561
24-m Post-O	18/183 (9.8%)	11/137 (8.0%)	0.620

Table 2. Revisions, Complications and Fusion

	PEEK	Titanium	p-value
Intraoperative Complications	5 (2.7)	5 (3.7)	0.641
Total Revisions (%)	19 (10.4)	4 (2.9)	0.011
Successful Fusion (%)	170/183 (92.9)	130/137 (94.9)	0.466

Figure 1. Lateral Standing Radiographs of the Lumbar Spine after Single-Level MI-TLIF with Titanium Cage a) Immediately and b) 1 Year After Surgery, and PEEK Cage c) Immediately and d) 1 Year After Surgery, Showing Uneventful Fusion



Results

- 320 patients were enrolled: 137 Ti (42 open, 95 MI) and 183 PEEK (53 open, 130 MI).
- The overall revision rates were 10.4% for the PEEK cohort and 2.9% for the Ti cohort (p= 0.011) (Table 2).
- There were no statistically significant differences in graft subsidence rates between the PEEK and Ti cohorts (Table 1).
- The most common complications were pseudarthrosis in the PEEK cohort and adjacent segment disease in the Ti cohort.
- Both groups experienced similarly significant improvements in their functional outcome scores compared to their pre-operative values.
- No significant differences in complications, revision rates, graft subsidence, or fusion rates was observed between MI or open techniques within groups.

Conclusions

- The Ti cohort demonstrated a significantly significant lower rate of revision than the PEEK cohort.
- The Ti cohort trended toward a higher rate of fusion, with similar rates of subsidence and improvement in functional outcome scores as the PEEK cohort.

References

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Title: PEEK vs. Titanium Cages in Transforaminal Lumbar Interbody Fusion: A 2-Year Follow-Up Study with Clinical and Radiological Outcomes

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