

Outcomes Comparison between Novel Hydroxyapatite Enhanced PEEK and Titanium Implants after Anterior Lumbar Interbody Fusion

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BACKGROUND

ALIF approach has many benefits.

The hydrophobic & chemically inert properties of PEEK are associated with lower fusion potential compared to titanium.

A novel ALIF implant may mitigate the risk of nonunion.

OBJECTIVES

1. Compare **fusion rates** between 2 novel ALIF implants:

HA PEEK – hydroxyapatite infused PEEK with titanium face plate and integral screws

TiHA – titanium implant integrated with hydroxyapatite surface technology, tetracell porous structure, and integral screws

2. Compares **revision surgery rates** and changes in **ODI scores** at 1 year

What
Matters

METHODS

Multicenter, retrospective cohort study of prospectively collected data

23 US centers of adult ALIF/PIF ≤ 5 levels using HA PEEK or TiHA implants

Minimum 1-year follow-up

Changes in ODI scores were calculated

Fusion analysis by validated motion detection software

Fusion defined as $\leq 2^\circ$ of angular motion across flexion-extension x-rays

CONCLUSIONS



No difference in fusion rates at 6 months or 1 year



No difference in revision surgery rates at 1 year



No difference in ODI improvement at 1 year



RESULTS

Differences between groups:

- HA PEEK older (57 vs. 53 yrs.)
- Primary indication
- TiHA with more multilevel cases
- TiHA with more BMP use

VARIABLES	IMPLANT COHORTS		
	HA PEEK 234 (56)	TiHA 184 (44)	p-value
Age (years), M(SD)	57 $\pm$ 14	53 $\pm$ 12	0.010
Males, n(%)	86 (44.3)	94 (53.4)	0.081
BMI (kg/m ²), median(IQR)	28.5 (25.5-34.0)	29.0 (25.8-32.6)	0.864
CCI, n(%)			
< 2	219 (93.6)	176 (95.6)	0.359
≥ 2	15 (6.4)	8 (4.4)	
Nicotine Use, n(%)			
Never	147 (75.8)	130 (73.9)	0.874
Previous Use	27 (13.9)	25 (14.2)	
Current Use	20 (10.3)	21 (11.9)	
Primary Surgical Indication, n(%)			
Degenerative pathologies	112 (57.7)	90 (51.1)	0.005
Spinal Stenosis	66 (34.0)	51 (29.0)	
Other	16 (8.3)	35 (10.9)	
Prior Spine Surgery, n(%)			
No	118 (60.8)	117 (66.9)	0.229
Yes	76 (39.2)	58 (33.1)	
Levels Treated, n(%)			
One	115 (58.1)	71 (39.9)	0.001
Two	75 (37.9)	89 (50.0)	
Three or more	8 (4.0)	18 (10.1)	
Graft Material Includes BMP, n(%)			
No	144 (72.7)	37 (20.8)	<0.001
Yes	54 (27.3)	141 (79.2)	
Hospital Length of Stay (days), median (IQR)	3 (2-5)	3 (3-4)	0.385

OUTCOMES	IMPLANT COHORTS		
	HA PEEK 234 (56)	TiHA 184 (44)	p-value
Fusion Analysis at 6 months, n(%)			
≤ 2 degrees	55 (88.7)	73 (96.0)	0.113
> 2 degrees	7 (11.3)	3 (4.0)	
Fusion Analysis at 1 year, n(%)			
≤ 2 degrees	41 (89.1)	48 (94.1)	0.471
> 2 degrees	5 (10.9)	3 (5.9)	
Revision Surgery up to 1 year, n(%)			
No	95 (96.0)	78 (96.3)	1.000
Yes	4 (4.0)	3 (3.7)	
Change in ODI scores at 1 year, M(SD)	+28.2 $\pm$ 18.0	+24 $\pm$ 18.0	0.407

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