

ARTICLE IN REVIEW:

Structural allografts provide better outcomes than PEEK cages in spinal fusion procedures

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TITLE: Structural Allograft versus Polyetheretherketone Implants in Patients Undergoing Spinal Fusion Surgery: A Systematic Review and Meta-Analysis

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STUDY DESIGN: Meta-analysis

SUMMARY: Interbody spacers, such as structural allografts or polyetheretherketone (PEEK) cages, are a popular alternative to autograft for spinal fusion. Comparisons of clinical success of these two materials are scarce. This systematic review of 7 studies included 6640 patients who underwent single-level or multilevel spinal fusion procedures with structural allografts (n=4250), or PEEK cages (n=2390). There were no significant differences in the patient demographics between the groups, including age, gender, BMI, and smoking status. By the final followup, the rate of fusion in the structural allograft group was 2.59-fold higher compared to the PEEK cages group (OR 2.59, 95% CI 1.02-6.57, p=0.05). Structural allografts were 61% less likely to result in pseudarthrosis (OR 0.39, 95% CI 0.15-0.98, p=0.05) and were 74% less likely to result in reoperation (OR 0.26, 95% CI 0.09-0.79, p=0.02). In an analysis of patients who underwent fusions in the cervical spine, those treated with structural allografts had 4.68-fold higher likelihood of fusion than patients treated with PEEK cages (OR 4.68, 95% CI 2.08-10.54, p=0.0002). These results align with previously reported fusion rates in the cervical spine. While prospective studies are needed, this analysis concludes structural allografts provide higher fusion rates and lower rates of pseudarthrosis compared to PEEK cages.

Better fusion rates:

The pooled fusion rate in patients treated with structural allografts was 90.5% compared to 77.4% in patients with PEEK cages.

Lower risk of pseudarthrosis and revision:

Patients treated with structural allografts were 61% less likely to have pseudarthrosis and 74% less likely to require reoperation.

Greater rate of fusion in the cervical spine:

Patients with structural allografts had 4.68-fold higher likelihood of fusion than those with PEEK cages.

Structural allografts provide better outcomes than PEEK cages

Parameter	Structural Allograft	PEEK
Patients (n)	4250	2390
Rate of pseudarthrosis	2.82%	8.91%
Rate of reoperation	0.07%	0.2%
Rate of fusion	90.5%	77.4%

Adapted from Table 3.

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