

Fig. E-1

Longitudinal changes in the radiolucent zone around the pedicle screws (PS) on lateral radiographs. The mean grade decreased up to one year, then increased significantly up to two years and nonsignificantly up to four years (*1, $p = 0.037$; and *2, $p = 0.035$ [Wilcoxon signed-rank test]).

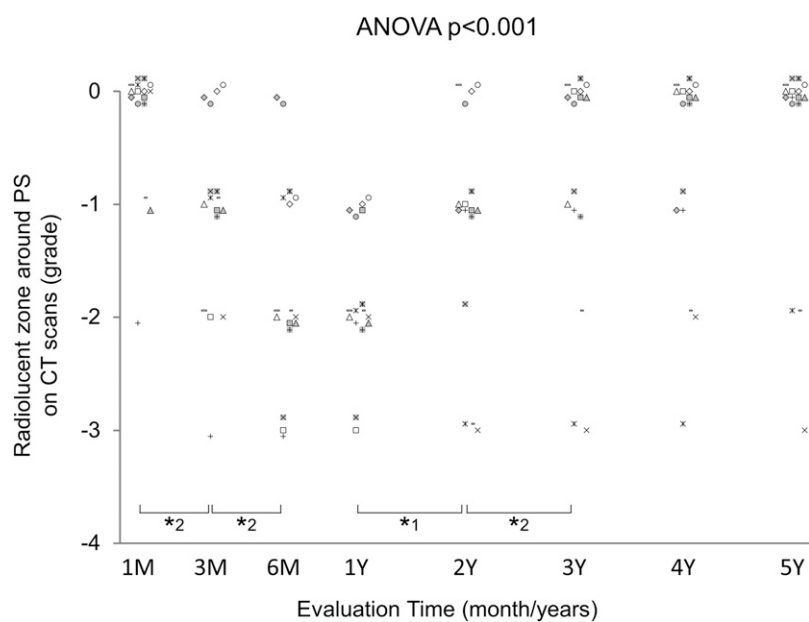


Fig. E-2

Longitudinal changes in the radiolucent zone around the pedicle screws (PS) on CT scans. The mean grade decreased up to one year, then increased significantly up to three years (*1, $p = 0.039$; and *2, $p < 0.01$ [Wilcoxon signed-rank test]).

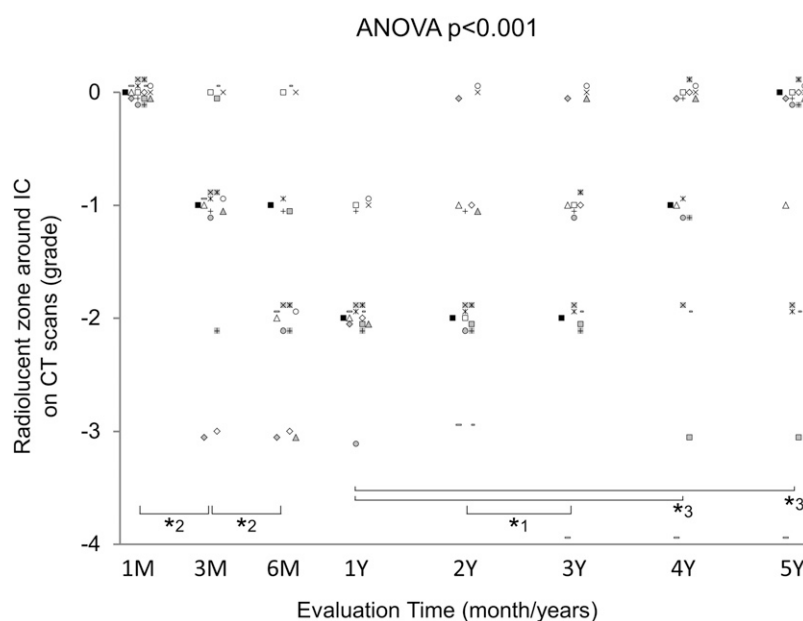


Fig. E-3

Longitudinal changes in the radiolucent zone around the interbody cage (IC) on CT scans. The mean grade decreased up to one year, then increased significantly between one and five years (*1, $p = 0.034$; and *2, $p < 0.01$ [Wilcoxon signed-rank test]; *3, $p < 0.01$ [Games-Howell test]).

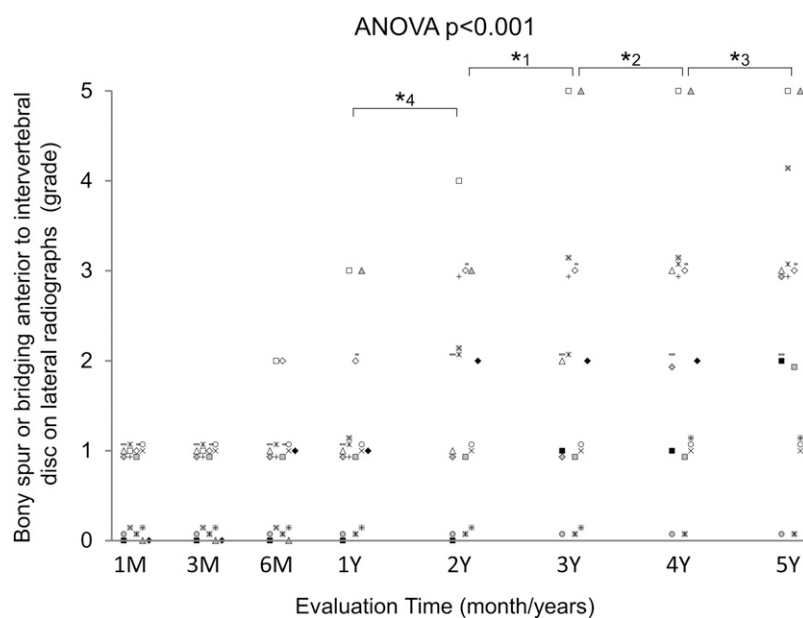


Fig. E-4

Longitudinal changes in the osseous spur or bridging bone anterior to the intervertebral disc on lateral radiographs. The mean grade began to increase after three months and increased significantly each year between one and five years (*1, $p = 0.034$; *2, $p = 0.046$; *3, $p = 0.046$; and *4, $p < 0.01$ [Wilcoxon signed-rank test]).

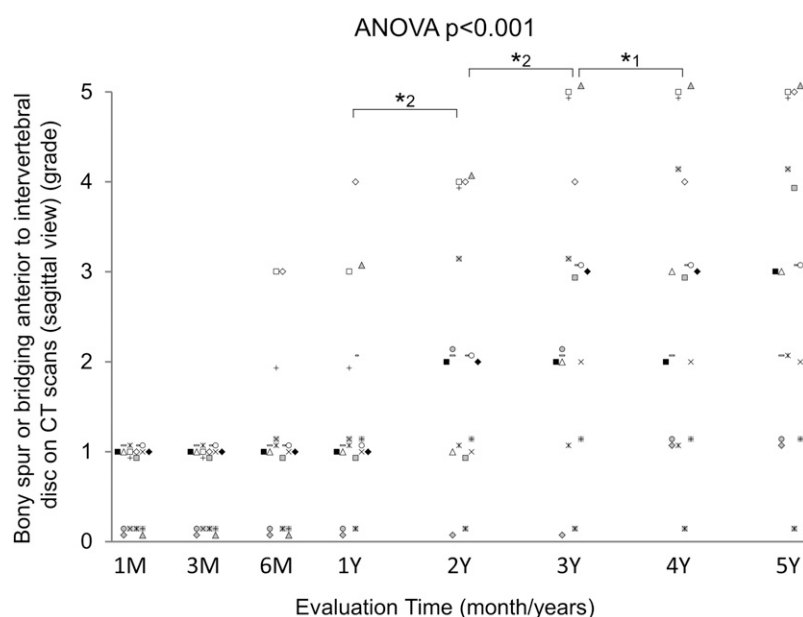


Fig. E-5

Longitudinal changes in the osseous spur or bridging bone anterior to the intervertebral disc on CT scans (sagittal view). The mean grade began to increase after three months and increased significantly each year between one and four years (*1, $p = 0.046$; and *2, $p < 0.01$ [Wilcoxon signed-rank test]).

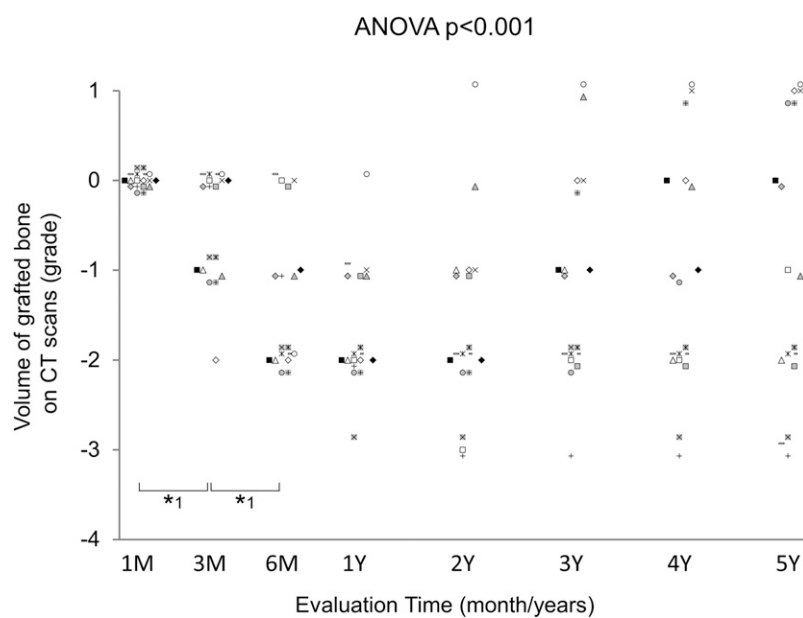


Fig. E-6

Longitudinal changes in the volume of grafted bone on CT scans. The mean grade decreased significantly up to six months (*1, $p < 0.01$ [Wilcoxon signed-rank test]); a later increase is evident (especially from two to three years) but did not reach significance.

TABLE E-1 Grading of Interpretations of Radiographs and CT Scans

Parameter		Grade: Definition				
Radiolucent zone around screw	0: no radiolucent zone	–1: ≤1 mm (partial)	–2: ≤1 mm (whole)	–3: >1 but ≤2 mm	–4: >2 mm	–5: cutout of the pedicle
Radiolucent zone around cage	0: no radiolucent zone	–1: ≤1 mm (partial)	–2: ≤1 mm (whole)	–3: >1 but ≤2 mm	–4: >2 mm	–5: migration
Osseous spur anterior to intervertebral disc	0: no osseous spur	1: osseous spur not beyond end-plate level	2: bridging <1/3	3: bridging ≥1/3 but <2/3	4: bridging ≥2/3 but <1	5: complete osseous bridging anterior to disc
Volume of grafted bone relative to original on CT scans	1: >1	0: 1	–1: ≥2/3 but <1	–2: <2/3 but ≥1/3	–4: <1/3 but >0	–4: 0 (complete disappearance)

TABLE E-2 Patient Demographic Data

	Fusion at 1 Year	Pseudarthrosis at 1 Year	P Value
No. of patients	136	17	
Mean age (range) (yr)	58.6 (31-74)	67.1 (56-74)	0.0004*
Male (%)	56.3	55.6	0.9524†
No. of fusion levels, 1:2 (no.)	117:19	12:5	0.1479†
Level of fusion (no.)			0.7146‡
L2/L3	1	0	
L3/L4	27	5	
L4/L5	108	11	
L5/S	19	3	
Mean BMI (range)§ (kg/m ²)	24.1 (15.2-38.1)	23.5 (20-28.8)	0.3068*
Smoking (%)	27.7	15.8	0.5621†
Bone graft, ICB:LB# (no.)	81:55	9:8	0.6012†

*Paired t test. †Fisher exact test. ‡Chi-square test. §BMI = body mass index. #ICB = iliac crest bone with local bone, and LB = local bone only.

TABLE E-3 Agreement of Radiographic Assessments

	Intraobserver Agreement		Interobserver Agreement	
	Kappa*	Level of Agreement†	Kappa*	Level of Agreement†
Grade on radiographs				
Radiolucent zone around screw	0.51 (0.25-0.77)	Moderate	0.43 (0.18-0.68)	Moderate
Radiolucent zone around cage	0.30 (0.07-0.53)	Fair	0.25 (0.03-0.48)	Fair
Osseous bridging anterior to disc	0.71 (0.53-0.89)	Substantial	0.65 (0.46-0.85)	Substantial
Grade on CT scans				
Radiolucent zone around pedicle screw	0.73 (0.52-0.94)	Substantial	0.68 (0.46-0.90)	Substantial
Radiolucent zone around cage	0.42 (0.20-0.64)	Moderate	0.40 (0.18-0.56)	Moderate
Osseous bridging anterior to disc	0.75 (0.57-0.93)	Substantial	0.56 (0.33-0.78)	Moderate
Volume of grafted bone	0.63 (0.42-0.85)	Substantial	0.61 (0.38-0.84)	Substantial

*The values are given as the estimate with the 95% confidence interval (determined by the normal approximation method) in parentheses.
†According to the categorization by Landis and Koch¹⁵⁻¹⁷.

TABLE E-4 Correlation of the Cage Radiolucent Zone with Other Radiographic Findings*

Time (yr)		Range of Motion†	Volume of Grafted Bone on CT‡	Osseous Bridging Anterior to Disc on CT§	Disc Height Decrease#	Cage Subsidence#
1	R	0.021	-0.273	0.252	-0.063	-0.466
	P value	0.938	0.289	0.328	0.809	0.059
2	R	-0.216	-0.418	0.076	0.254	-0.481
	P value	0.421	0.095	0.771	0.324	0.048
3	R	-0.316	-0.458	0.137	0.263	-0.407
	P value	0.216	0.065	0.599	0.307	0.105
4	R	-0.511	-0.369	0.156	0.551	-0.352
	P value	0.036	0.145	0.551	0.022	0.165
5	R	-0.451	-0.678	-0.038	0.331	-0.399
	P value	0.069	0.003	0.885	0.194	0.112

*The r value indicates the Spearman correlation coefficient of the parameter with the radiolucency around the cage on CT scans; the radiolucency was analyzed as the grade, which was ≤0. †Analyzed in degrees. ‡Analyzed as the grade, which was ≤1. §Analyzed as the grade, which was ≥0. #Analyzed in millimeters.