Tables

Table 1 Histopathology scores (Mean±SD) demonstrate that Silicate-substituted Calcium Phosphate with Enhanced Porosity has comparable tissue reaction at all time points when used alone (SiCaP EP), mixed with bone marrow aspirate (SiCaP EP/BMA), or mixed with iliac crest bone graft (SiCaP EP/ICBG)

Parameters	SiCaP EP n=5	SiCaP EP/BMA n=5	SiCaP EP/ICBG n=5	p-value	Post-hoc
Polymorphonuclear cells					
4 Weeks	0.13±0.30	0.40±0.55	0.00±0.00	0.221	-
8 Weeks	0.06±0.13	0.72±0.44	0.50±0.59	0.098	-
12 Weeks	0.00±0.00	0.00±0.00	0.10±0.25	0.178	-
Lymphocytes					
4 Weeks	0.27±0.37	0.93±0.72	0.93±0.72	0.043	N.S.
8 Weeks	2.00±0.00	2.00±0.00	2.00±0.00	0.392	-
12 Weeks	2.00±0.39	2.00±0.19	1.71±0.49	0.510	-
Plasma cells					
4 Weeks	0.00±0.00	0.47±0.51	0.20±0.45	0.078	-
8 Weeks	1.83±0.41	1.83±0.41	1.83±0.41	0.999	-
12 Weeks	0.90±0.25	1.00±0.00	1.00±0.00	0.016	N.S.
Macrophages					
4 Weeks	1.80±0.45	2.00±0.00	1.60±0.55	0.452	-
8 Weeks	1.72±0.61	1.67±0.52	1.33±0.52	0.039	N.S.
12 Weeks	2.29±0.62	2.38±0.49	1.86±0.63	0.326	-
Giant cells					
4 Weeks	1.67±0.47	2.00±0.00	1.60±0.55	0.193	-
8 Weeks	1.78±0.91	2.22±0.66‡	1.00±0.00	0.018	<0.05: SiCaP EP/BMA vs SiCaP EP/ICBG
12 Weeks	1.19±0.38	1.57±0.79	1.00±0.00	0.181	-
Neovascularization					
4 Weeks	1.60±1.14	2.60±0.55	1.27±0.72	0.071	-
8 Weeks	0.67±0.82	0.95±0.83	1.11±0.78	0.691	-
12 Weeks	0.86±0.63	1.10±0.92	0.76±0.53	0.784	-
Fibrocytes/fibroconnective tissue, fibrosis					
4 Weeks	1.80±1.30	2.80±0.45	1.60±0.55	0.163	-
8 Weeks	0.06±0.13	0.72±0.44	0.50±0.59	0.098	-
12 Weeks	0.00±0.00	0.00±0.00	0.10±0.25	0.178	-

-: Not applicable

‡ Significant difference vs. SiCaP EP/ICBG

N.S.: Not significant

Figures

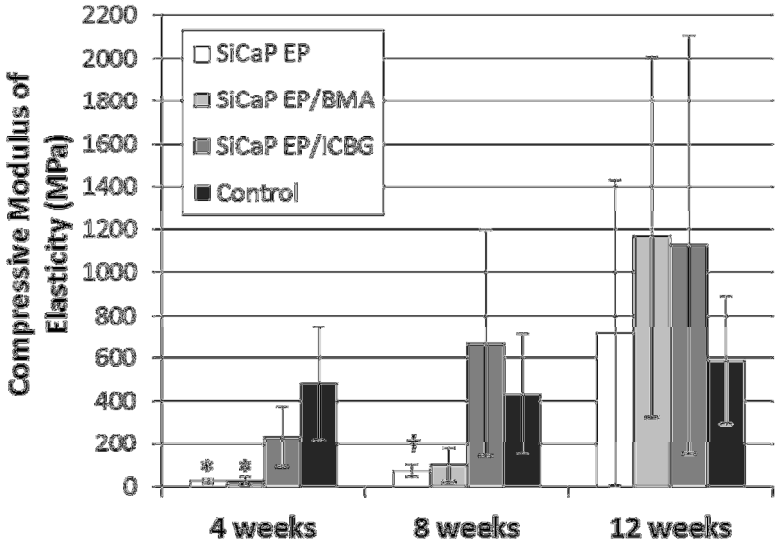

Fig. 1 Defects treated with silicate-substituted calcium phosphate with enhanced porosity mixed with iliac crest bone graft (SiCaP EP/ICBG) had a greater compressive modulus of elasticity at early time points when compared to treatment with stand-alone (SiCaP EP) or mixed with bone marrow aspirate (SiCaP EP/BMA), but all three groups had comparable properties at 12 weeks. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs Control ($p<0.05$), † - significant difference vs SiCaP EP/ICBG ($p<0.05$)

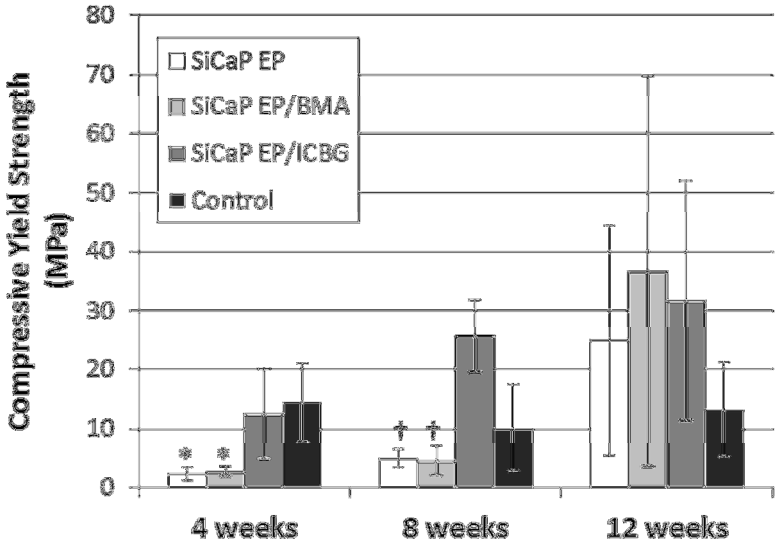

Fig. 2 Defects treated with silicate-substituted calcium phosphate with enhanced porosity mixed with iliac crest bone graft (SiCaP EP/ICBG) had a higher compressive yield strength at early time points compared to treatment with stand-alone (SiCaP EP) or mixed with bone marrow aspirate (SiCaP EP/BMA), but all three groups had comparable properties at 12 weeks. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs Control ($p<0.05$), † - significant difference vs SiCaP EP/ICBG ($p<0.05$)

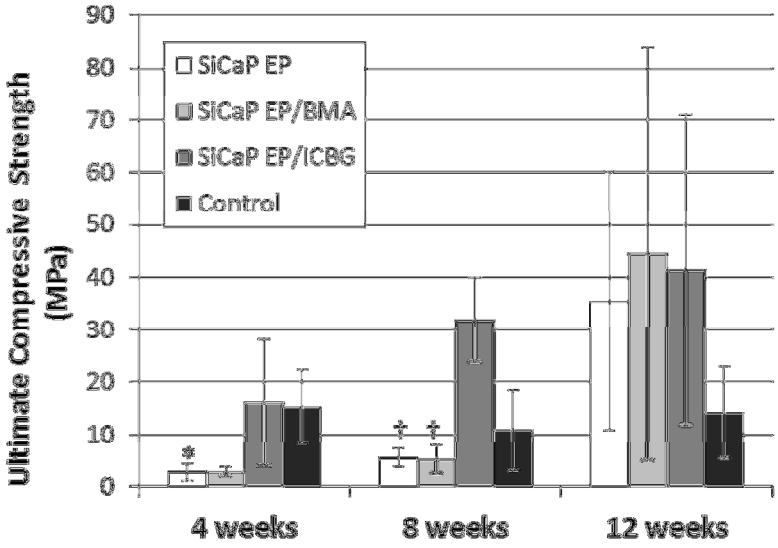

Fig. 3 Defects treated with silicate-substituted calcium phosphate with enhanced porosity mixed with iliac crest bone graft (SiCaP EP/ICBG) had a higher ultimate compressive strength at early time points when compared to treatment with stand-alone (SiCaP EP) or mixed with bone marrow aspirate (SiCaP EP/BMA), but all three groups had comparable properties at 12 weeks. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs Control ($p<0.05$), † - significant difference vs SiCaP EP/ICBG ($p<0.05$)

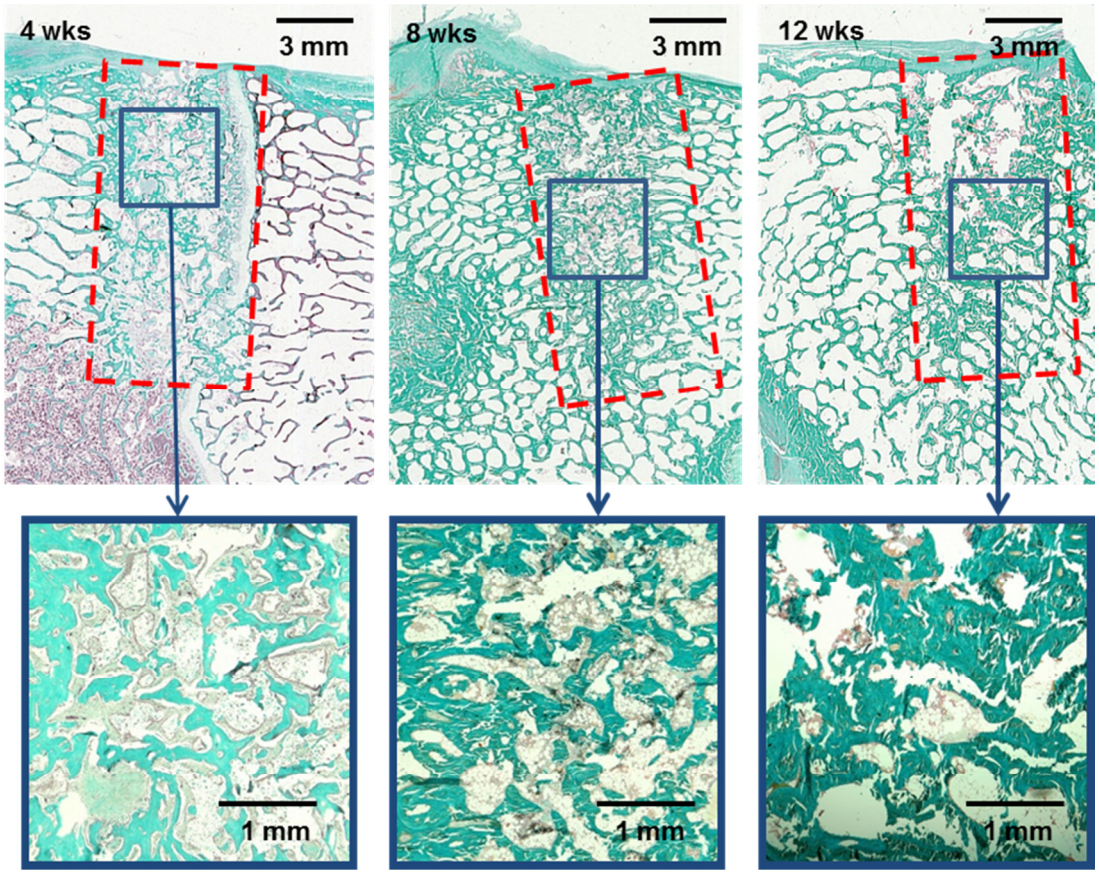

Fig. 4 Representative decalcified histology images of the SiCaP EP group stained with Goldner's Trichrome at each time-point show infiltration of mature organized bone (green) throughout the defect at all time points along closely affiliated with the graft material (white). Lower magnification images of the entire defect site (outlined in dashed red lines) are presented in the top row with higher magnification images below.

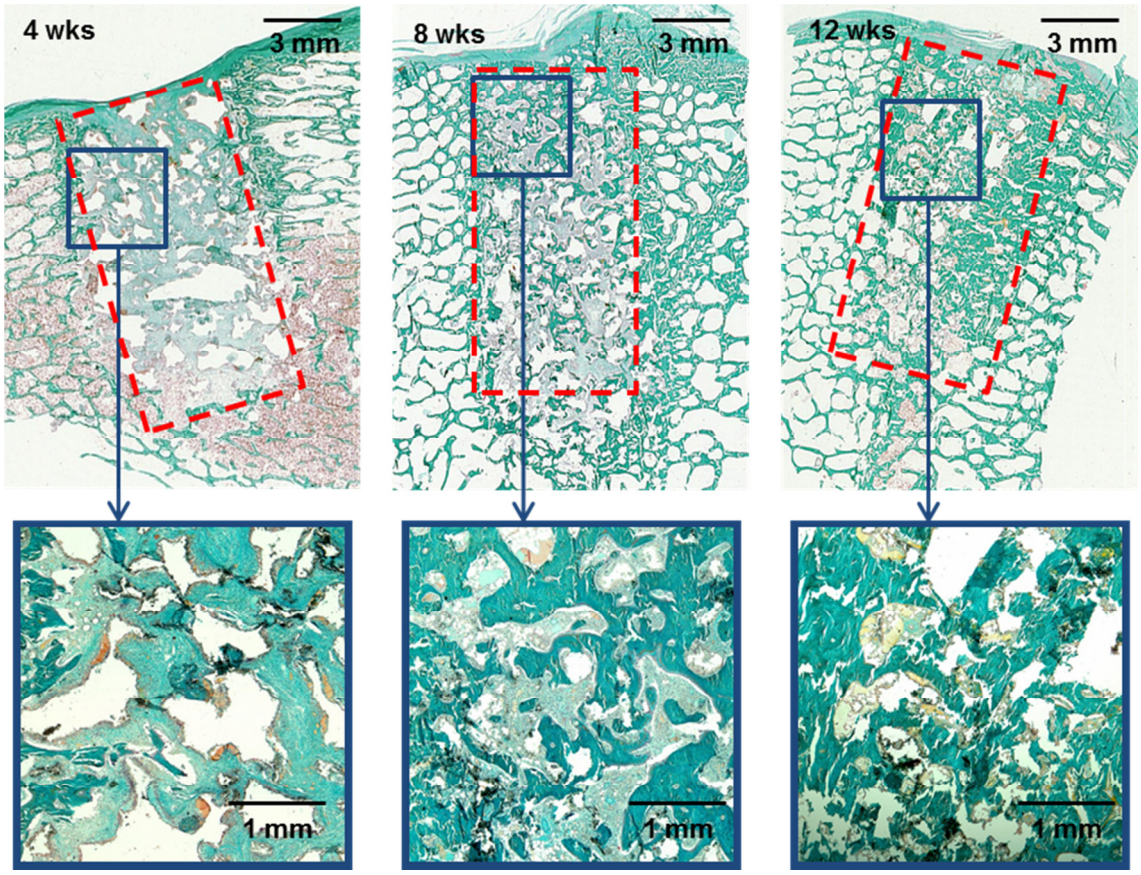

Fig. 5 Representative decalcified histology images of the SiCaP EP/BMA group stained with Goldner's Trichrome at each time-point show infiltration of bone (green) throughout the defect which had a mature organized morphology at 8 and 12 weeks. Bone was closely affiliated with the graft material (white). Lower magnification images of the entire defect site (outlined in dashed red lines) are presented in the top row with higher magnification images below.

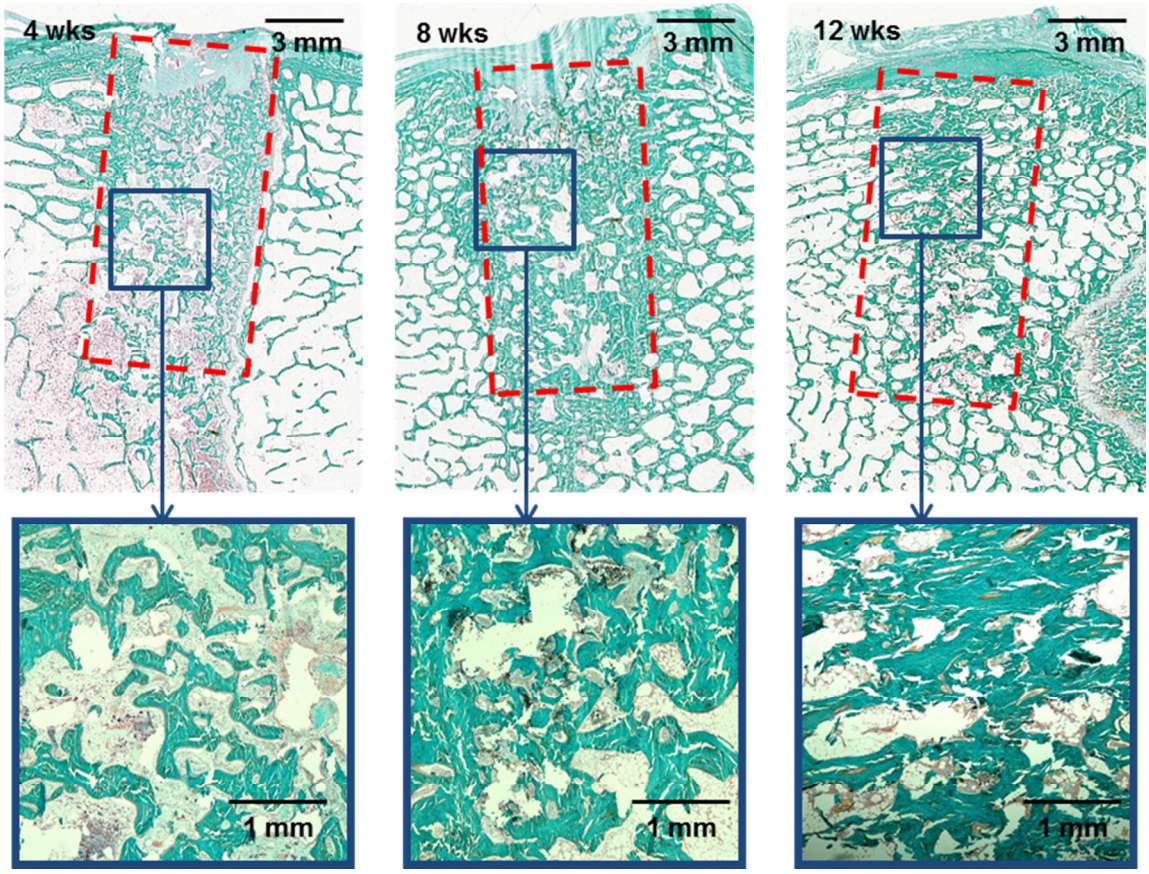

Fig. 6 Representative decalcified histology images of the SiCaP EP/ICBG group stained with Goldner's Trichrome at each time-point show infiltration of mature organized bone (green) throughout the defect at all time points along closely affiliated with the graft material (white). Lower magnification images of the entire defect site (outlined in dashed red lines) are presented in the top row with higher magnification images below.

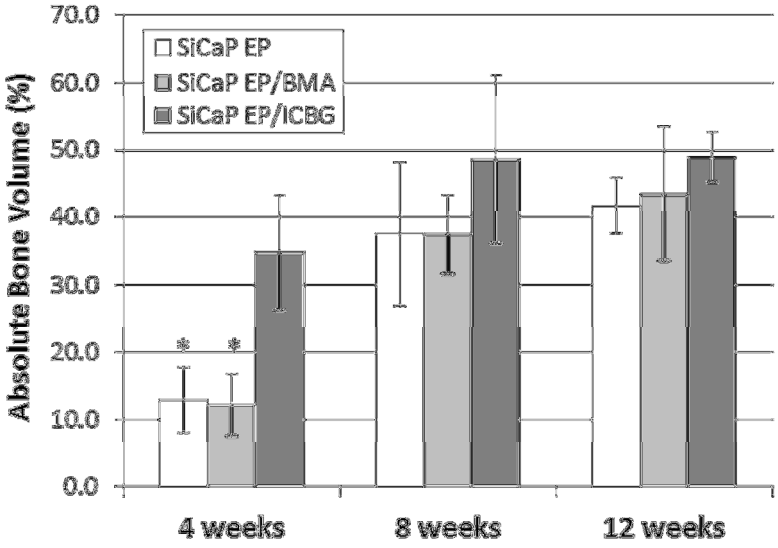

Fig. 7 The SiCaP EP/ICBG group had a higher absolute bone volume percentage at 4 weeks when compared to treatment with stand-alone (SiCaP EP) or mixed with bone marrow aspirate (SiCaP EP/BMA) but all three groups had comparable properties at 8 and 12 weeks. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs SiCaP EP/ICBG ($p<0.05$)

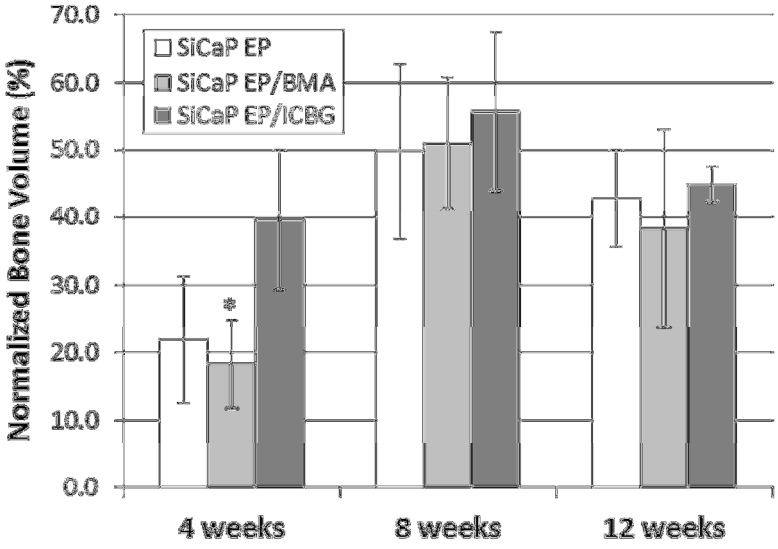

Fig. 8 The SiCaP EP/ICBG group had equivalent normalized bone volume percentage compared to treatment with stand-alone (SiCaP EP) at all time points. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs SiCaP EP/ICBG ($p<0.05$)

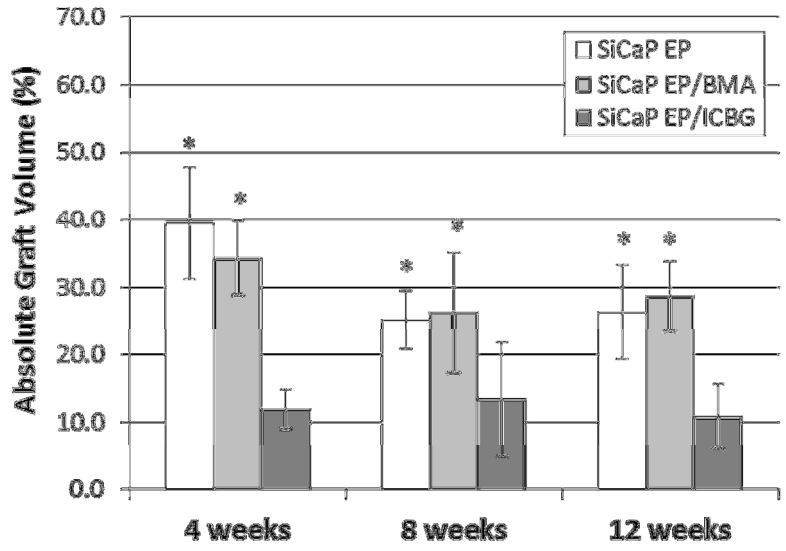

Fig. 9 The SiCaP EP and SiCaP EP/BMA groups had more absolute graft volume percentage compared to the extender group (SiCaP EP/ICBG). Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * - significant difference vs SiCaP EP/ICBG ($p<0.05$)

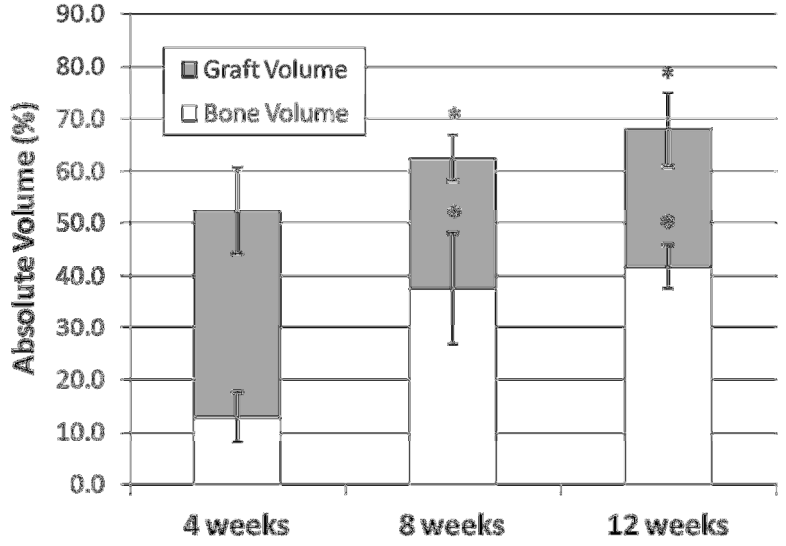

Fig. 10 The absolute bone volume increased (indicating osteoconduction) and absolute graft volume decreased (indicating graft resorption) over time in defects treated with SiCaP EP. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * $p<0.05$ compared to 4 weeks.

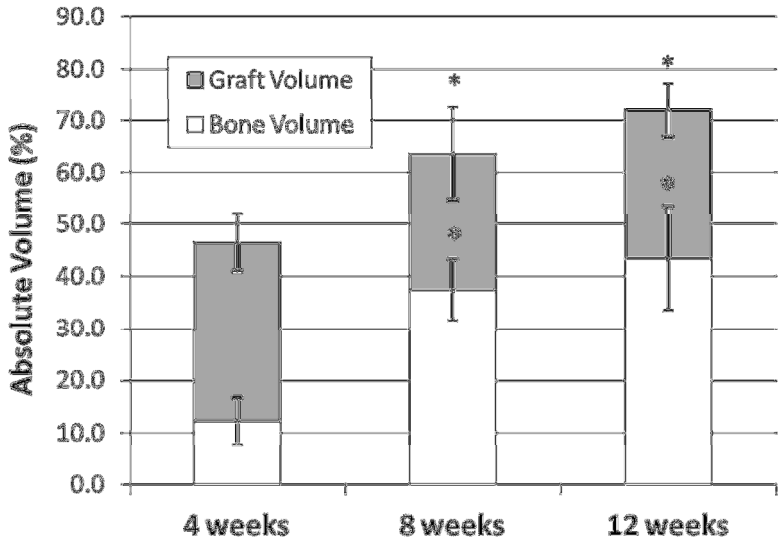

Fig. 11 The absolute bone volume increased over time (indicating osteoconduction) in defects treated with SiCaP EP/BMA. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * $p<0.05$ compared to 4 weeks.

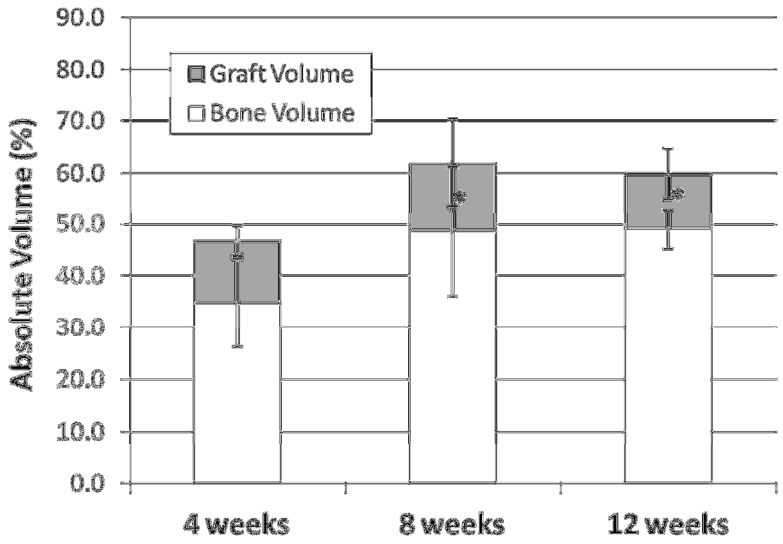

Fig. 12 The absolute bone volume increased over time (indicating osteoconduction) in defects treated with SiCaP EP/ICBG. Data was statistically assessed with one-way ANOVA and Tukey's post-hoc test for normal/equal variance data and Kruskal-Wallis analysis with Wilcoxon's Mann Whitney U test for data that did not pass normality/equal variance tests: * $p<0.05$ compared to 4 weeks.