

Supplementary Materials

TyroFill–Titanium Implant Constructs for the Coordinated Repair of Rabbit Mandible and Tooth Defects

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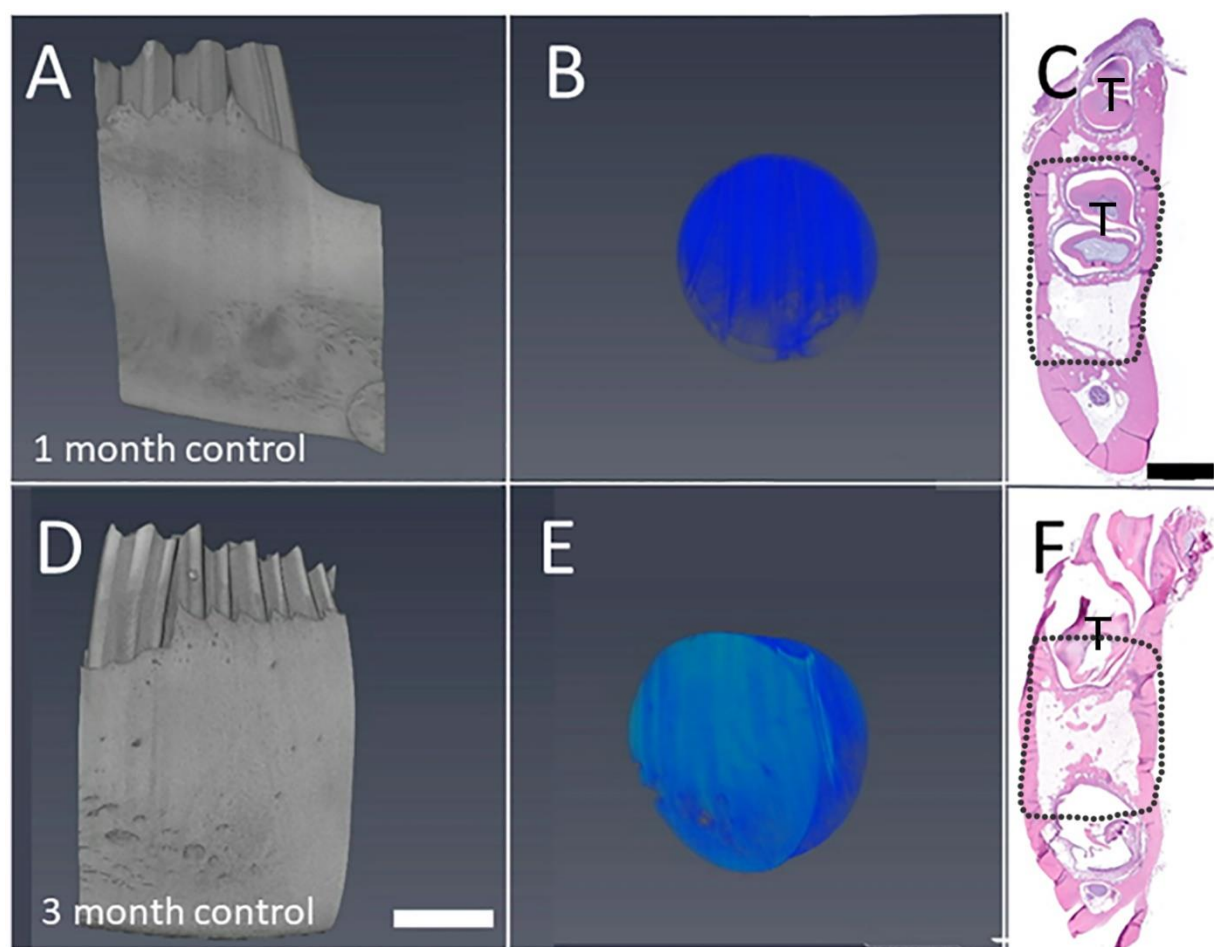


Figure S1. Microcomputed tomography (μ CT) and histology of unoperated control mandibles. (A,B) 1 month and (D,E) 3 months control mandibles. (A,D) 3D reconstructed μ CT data. (B,E) A selected 10 mm x 6 mm region of interest. (C,F) Stained sectioned 1 month (C) and 3 months (F) control mandibles. Dotted lines indicate the approximate position of implant placement. Abbreviations: T, Tooth. Scale bars = 2mm.

Table S1: Microcomputed tomography (μ CT) data of harvested implants. TryoFill constructs showed improved new bone formation as compared to previously used E1001(1K)-bTCP constructs. No significant differences were observed due to the limited number of implants placed in this study.

TryoFill		Bone Density	BV/TV (%)	Trabecular Thickness (mm)
1M	Cell seeded	0.65 ± 0.02	19.65 ± 5.87	0.33 ± 0.13
	Acellular	0.70 ± 0.11	15.35 ± 3.81	0.26 ± 0.00
	Control	0.67 ± 0.13	61.12 ± 11.02	0.65 ± 0.05
3M	Cell seeded	0.38 ± 0.08	56.05 ± 10.13	0.87 ± 0.52
	Acellular	0.56 ± 0.01	39.42 ± 10.98	0.51 ± 0.00
	Control	0.62 ± 0.08	53.50 ± 4.22	0.58 ± 0.07

E1001(1K)-bTCP		Bone Density	BV/TV (%)	Trabecular Thickness (mm)
1M	Cell seeded	0.54 ± 0.06	5.79 ± 2.47	0.07 ± 0.04
	Acellular	0.46 ± 0.12	13.05 ± 6.8	0.11 ± 0.01
	Control	0.47 ± 0.24	49.67 ± 0.00	0.264 ± 0.00
3M	Cell seeded	0.52 ± 0.06	19.45 ± 10.57	0.19 ± 0.11
	Acellular	0.4 ± 0.10	18.51 ± 0.00	0.19 ± 0.00
	Control	0.42 ± 0.21	42.94 ± 0.00	0.43 ± 0.00

Table S2: EDAX analysis of Ti Dental Implant Surfaces. Calcium was not detected on the surface of unimplanted control or 1-week *in vitro* cultured acellular Ti dental implants. Calcium was detected on the surface of Ti dental implants removed from 1 month and 3 month implanted constructs, although no obvious trend was observed likely due to the limited number of samples used in this study.

Ca ⁺⁺	% Weight	
	Average	SD
Unoperated Control	0.00%	0.000
1W Cell seeded	0.17%	0.002
1W Acellular	0.00%	0.000
1M Cell seeded	1.04%	0.013
1M Acellular	0.49%	0.005
3M Cell seeded	0.13%	0.001
3M Acellular	0.62%	0.007

Supplemental Videos 1–6:

Video S1. μ CT analysis of a cell-seeded construct after 1 month implantation. Scattered radio-opaque areas indicate calcified tissue formation throughout the implant site.

Video S2. μ CT analysis of an acellular construct after 1 month implantation. Very few radio-opaque areas of calcification were observed throughout the implant site.

Video S3. μ CT analysis of an unoperated control mandible at 1 month.

Video S4. μ CT analysis of a cell-seeded construct after 3 months implantation. Highly calcified mineralized tissue nodules indicative of new bone formation were observed throughout the implanted site.

Video S5. μ CT analysis of an acellular construct after 3 months implantation. Newly formed bone can be observed throughout the implant, but less than seen in cell-seeded constructs.

Video S6. μ CT CT analysis of an unoperated control mandible at 3 months.