

Clinical and Radiographic Assessment of Circular Versus Triangular Cross-section Neck Implants in the Posterior Maxilla: A 1-year Randomized Controlled Trial

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Abstract

Objectives: Implants with a triangular neck were recently introduced to limit periimplant bone loss. The primary objective of this randomized controlled trial was to compare peri-implant bone changes of circular versus triangular cross-section neck implants 1 year after loading. The secondary objectives were to assess buccal hard tissue thickness changes, Pink Esthetic Score (PES), and patient satisfaction.

Material and methods: Thirty four patients requiring replacement of the single, intercalated missing tooth of healed site for at least 4 months in the posterior maxilla were randomized into 2 groups according to the type of implant. Immediately after surgery and 1 year after final restoration, a cone beam CT (CBCT) was performed to assess proximal bone remodeling and buccal bone thickness. Peri-implant soft tissue health, PES, and patient-reported outcome measures (PROMs) were recorded.

Results: No implant loss occurred within the follow-up period. The mean \pm SD periimplant proximal bone loss 1 year after loading was 0.22 ± 0.30 mm for triangular and 0.42 ± 0.67 mm for circular implants necks ($p = .25$). Peri-implant bone loss exceeding 2 mm was observed in a single implant in the circular neck group. Buccal bone thickness remained stable and did not differ different between the 2 groups. The peri-implant soft tissue health, PES, and patient satisfaction were also comparable.

Conclusions: Within the limitations of the present study, patient clinical and radiographic outcomes did not differ between triangular and circular cross-section neck implants in the posterior maxilla.



Table. Buccal hard tissue thickness changes and peri-implant bone remodeling over 1-year post-loading follow-up

			Circular (mean \pm SD)	Triangular (mean \pm SD)	<i>p</i> -value
Peri-implant bone Remodeling (mm)	Mean \pm SD Range		0.42 \pm 0.67 0.0–2.81	0.22 \pm 0.30 0.0–0.79	.25
Buccal bone Thickness (mm)	Level 0	Baseline 1-year	1.34 \pm 1.08 1.03 \pm 1.05	1.34 \pm 0.74 1.08 \pm 0.72	.99 .86
		Baseline to 1-year changes	<i>p</i> = .52		
	Level – 2 mm	Baseline 1-year	1.93 \pm 1.08 1.66 \pm 0.93	1.84 \pm 0.73 1.50 \pm 0.74	.8 .59
		Baseline to 1-year changes	<i>p</i> = .38		
	Level – 4 mm	Baseline 1-year	1.94 \pm 1.30 1.66 \pm 1.23	1.75 \pm 0.84 1.37 \pm 0.77	.62 .43
		Baseline to 1-year changes	<i>p</i> = .32		

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