Variables influencing bone formation after transcrestal sinus floor elevation. Radiographic and tomographic evaluations

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Abstract

Purpose: To evaluate the influence of initial implant protrusion within the subantral space on hard tissue gain at implants installed simultaneously with transcrestal sinus floor elevation with a biomaterial.

Material and methods: Fifty implants were installed after transcrestal sinus floor elevation (TSFE) in forty-four patients using either a human demineralized bone matrix or a deproteinized bone mineral matrix. Endo-oral X-rays were obtained before and immediately after surgery. Cone beam computed tomography (CBCTs) scans were obtained at the last follow-up (mean period 6.6 years).

Results: The initial bone crest height was 4.6 ±1.4 mm and the initial protrusion of the implants above the sinus floor was 3.5 ±1.4 mm. At the follow-up assessments, the hard tissue mean gain was 2.5 ±1.5 mm, resulting in a mean residual protrusion of 1.1 ±1.3 mm. Only ten implants did not protrude above the apical level of hard tissue. A positive correlation was found between hard-tissue gain and initial protrusion (r=0.55; 95% CI). 0.32 to 0.72; p=0.0001), between the initial and final protrusions (r=0.38; 95% C.I. 0.10 to 0.60; p=0.007), and between the follow-up period and final protrusion (r=0.35; 95% C.I. 0.07 to 0.58; p=0.012).

Conclusions: The longer the implants, the higher the tissue gain and the final protrusion of the implant above the apical level of the hard tissue.