

Minimally invasive sinus lift elevation with a silicone balloon and simultaneous implant placement. An independent 1-year follow-up clinical study

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Background: The resorption process of the alveolar ridge after the extraction of maxillary molars and premolars often results in an inadequate amount of bone underneath the maxillary sinus, which impedes dental implant placement. Traditionally, the sinus lift technique (SLT) with a lateral approach and the 'atraumatic' osteotome SLT were used to solve this issue. However, the latter is only indicated in cases with an adequate amount of residual bone and where only minor augmentation is needed. Recently, several minimally invasive sinus mucosa balloon elevation techniques have been designed to overcome mucosa elevation difficulties, allowing also for greater bone augmentation, although scientific evidence is still scarce.

Aim/Hypothesis: To analyse the clinical results of SLT with silicone balloon elevation and simultaneous implant placement in 14 consecutive patients, with a 1-year follow-up.

Material and methods: Fourteen consecutive patients were recruited and treated between 2012/03 and 2013/04. Elevation of the sinus mucosa was performed by intrasinus inflation of a silicone balloon (MIAMBE[®]), gaining access through a 3 mm diameter osteotomy. The space created with the procedure was filled with bovine bone graft (Bio-Oss[®]), and a tapered dental implant was placed simultaneously (ASTRA OsseoSpeed[™] TX). The fibro-mucosa was closed with resorbable monofilament 6-0 sutures leaving the healing abutment exposed. An operating microscope was used throughout the procedure. The vertical bone gain and the implant success and complication rates were recorded as outcome variables.

Results: The technique was successfully performed in 71.4% of the cases (10); the failure of the remaining four was due to mucosa perforation (21.32%) and balloon breakage (7.14%). The mucosa perforation rate was similar to that described in other studies, using lateral access SLE, with a 20% rate of perforations, and higher than balloon elevation rates of previous reports (2.6–16.6%). The average basal residual bone was 5.2 mm, and the bone gain achieved was 8.5 mm, therefore allowing for 13 mm implant placement. This vertical gain obtained with an 'atraumatic' approach was higher than the one achieved with the osteotome SLT (2.8 mm). Implant success rate after the healing period was 100%, and at 1 year it was reduced to 90% (one implant showed marginal periimplantitis, not related with the balloon graft, which was successfully treated).

Conclusion and clinical implications: Minimally invasive SLT silicon balloon elevation appears to be a safe method that results in clinically significant bone gain, remaining stable for over 1 year period. The process should be refined in order to reduce the percentage of mucosa perforation.