

ZOOM IN: AMED INSIGHTS

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Minimally Invasive, Safe and Efficient: Microscope-facilitated crestal sinus lifts with immediate ceramic implant placement

INTRODUCTION

Maxillary sinus augmentation is a critical procedure for implant placement in the posterior maxilla with deficient bone height. The lateral window technique, first described by Tatum in 1975 and published by Boyne and James in 1980, involves creating a bony window to elevate the Schneiderian membrane.¹ The crestal (transalveolar) approach, introduced by Summers in 1994, accesses the sinus floor through the alveolar crest, offering a less invasive alternative.² This report presents three cases of a novel technique for crestal sinus lifts with immediate ceramic implant placement. Utilization of the Dental Operating Microscope (DOM), osseodensification burs, piezo-surgery, and platelet-rich-fibrin (PRF) allowed for a safe, clearly visualized, step-by-step approach for implant rehabilitation in complex clinical scenarios.

CASE PRESENTATION

Two healthy, ASA I patients, aged 34 and 65 years old, presented with missing maxillary molars and residual bone height of 2–5 mm, as confirmed by cone-beam computed tomography (CBCT). There was no sinus pathology in either case. Local anesthesia (articaine 4% with epinephrine 1:100,000 and bupivacaine 0.5% with epinephrine 1:200,000) was administered and a mid-crestal incision and full-thickness mucoperiosteal flap was raised. The operating microscope was utilized for the entire surgery. Osteotomies were initiated using Acteon Piezotome® unit with a diamond round tip, and copious saline irrigation. This allowed for a measured and steady purchase point without the variation or chattering that a rotating round bur can produce. The pilot bur, of the Versah Densah® system was then used to advance the osteotomies to within 1-2mm of the sinus floor and within 1mm of desired final osteotomy width; then in densifying mode (1200 rpm, counterclockwise, with saline irrigation) to within 1 mm of the sinus floor and gentle pressure with haptic feedback. The densification was repeated to the final desired diameter and increasing pressure although not fracturing the sinus floor. The piezotome was then used on the dense bone setting and a diamond tip to remove the crestal bony window. The membrane was clearly visualized with only 2-5mm residual bone height and osteotomies 4-5mm in width. The Zeiss Extaro 300® provided excellent illumination and magnification, ensuring clear visualization of the Schneiderian membrane, utilizing its Multi-Spectral mode. The membrane was further elevated and freed with currettes and irrigation. There were no perforations. The sites were fumigated with ozone gas and then solid membranes of Platelet-Rich-Fibrin were placed first to aid in protection of the membrane, followed by 1cc of total graft material (0.5cc of cortico-cancellous allograft by Maxxeus®, mixed with liquid and solid

PRF). The PRF was prepared via centrifugation (2200rpm x 8 minutes). Each site achieved an approximate 10mm lift- enough to accommodate placement of 11mm implants. Swiss Dental Solutions 2.2 ceramic implants (4.6 mm & 5.4 x 11 mm length) were immediately placed with at least 35 Ncm torque. Post-operative PA radiographs and CBCT confirmed implant position and graft containment. No membrane perforations or intra-operative complications occurred, and patients reported minimal post-operative discomfort or pain.

DISCUSSION

The crestal approach, enhanced by osseodensification and piezoelectric surgery, reduces surgical trauma compared to the lateral window technique, which carries a 20–60% membrane perforation risk.³ The increased density allows for better primary stability which can be challenging in minimal or porous bone.⁴ Single-stage surgery minimizes patient discomfort, reduces treatment time, and avoids secondary procedures.⁵ The DOM's enhanced visualization ensures precise membrane handling. Zirconia dental implants have low plaque affinity, strength, and no peri-implant metal particle release.⁶

CONCLUSION

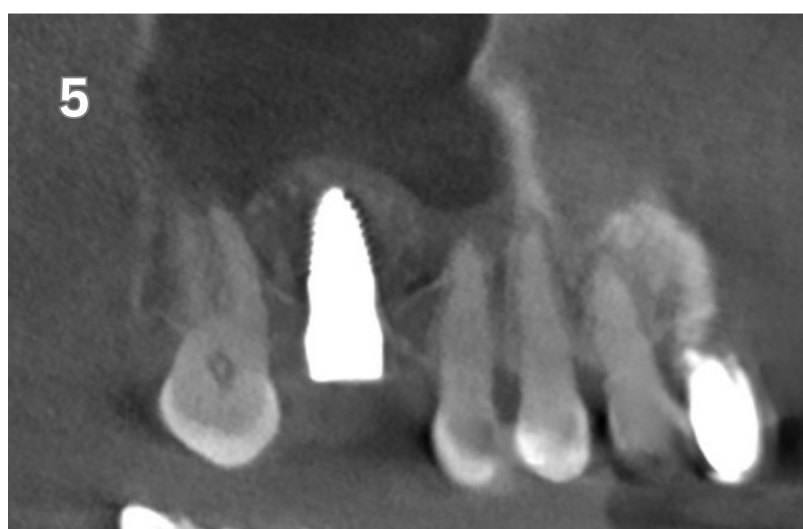
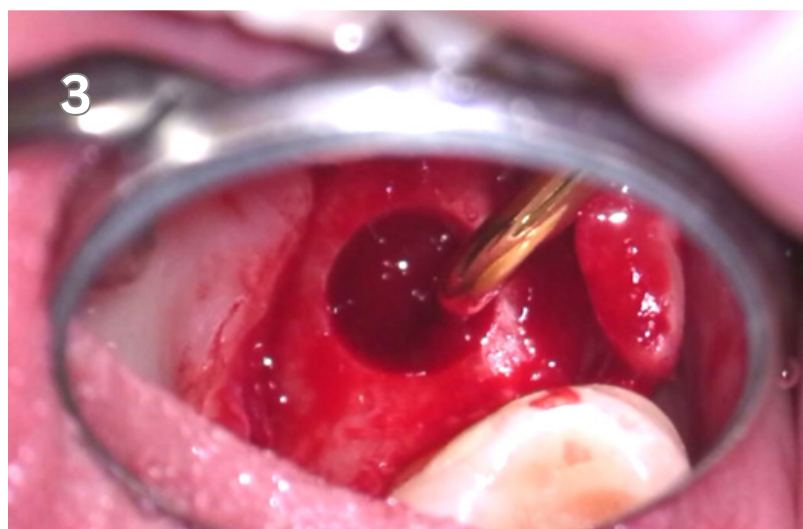
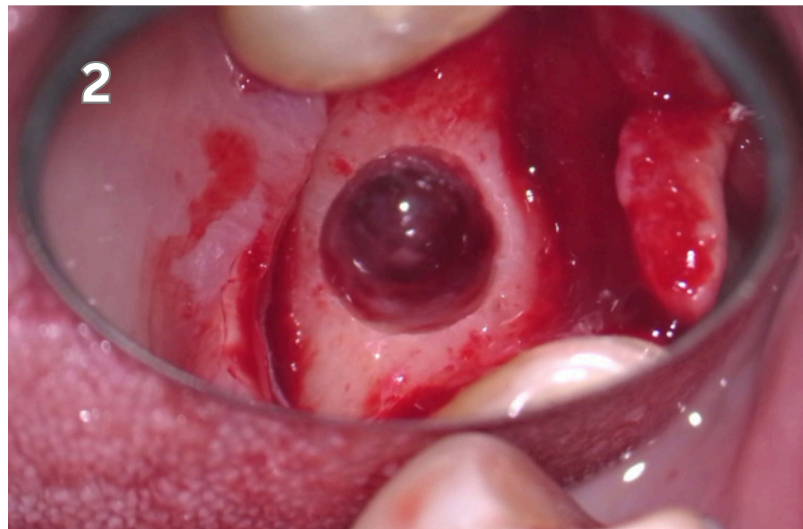
The lateral lift, with delayed implant placement has been the gold standard for cases of low residual bone height. Microscope-facilitated crestal sinus lifts with immediate implant placement offer what may be a

predictable and minimally invasive solution for posterior maxillary rehabilitation, leveraging advanced visualization and precise instrumentation. The microscope and modern surgical techniques may point the way towards less traumatic and potentially better outcomes for our patients.

REFERENCES

1. Boyne PJ, James RA. Grafting of the maxillary sinus floor with autogenous marrow and bone. *J Oral Surg.* 1980;38(8):613–616.
2. Summers RB. A new concept in maxillary implant surgery: the osteotome technique. *Compend Contin Educ Dent.* 1994;15(2):152–158.
3. Wallace SS, et al. Sinus elevation using piezosurgery. *Int J Periodontics Restorative Dent.* 2007;27(3):233–239.
4. AlRowis R, et al. Crestal sinus elevation using osseodensification technique: a case report. *Clin Case Rep Int.* 2025;3:124–130.
5. Xhanari E, et al. Crestal approach sinus lift: a randomized controlled trial. *J Oral Implantol.* 2021;47(4):287–294.
6. Singh PV, Reche A, Paul P, Agarwal S. Zirconia Facts and Perspectives for Biomaterials in Dental Implantology. *Cureus.* 2023 Oct 11;15(10):e46828. doi: 10.7759/cureus.46828. PMID: 37954766; PMCID: PMC10636592.

IMAGES



1. Pre-op ct
2. Microscopic view of osteotomy and membrane
3. Intraoperative view of sinus elevation with curette
4. Immediate ceramic implant placement with driver
5. Post-op CT