Effect of Schneiderian Membrane Perforation on Posterior Maxillary Implant Survival

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The extraction of posterior teeth and subsequent pneumatization of the maxillary sinus compromises osseointegrated implant placement in the posterior maxilla and necessitates associated surgical procedures like sinus floor elevation (sinus lift) and maxillary ridge augmentation.

The aim of this study was to assess the outcomes and complications of placing implants in the posterior maxilla with reduced CBH by intentional perforation of the Schneiderian membrane using a 2mm twist drill and up to 3mm implant protrusion beyond the sinus floor to concomitantly engage the sinus floor cortical bone.

Material and Mothed

Fifty-six patients (37 females and 19 males) with an average age of 52 years, who underwent placement of 63 implants in the posterior maxilla.

A 0.25 mm round drill (Mesinger, Germany) was used to locate the proposed site of the implant. Then, a 2 mm twist drill was used until the sinus was perforated (Replace select, tapered implants; Nobel Biocare, Sweden). The depth gauge (KLS Martin, Germany) was used to measure the actual CBH indicated by the distance. preparation with 3mm, 4mm and 5mm twist drills in sequence as per manufacturer's recommendations. The depth of implant site preparation was 2 mm less than the measured crestal bone height.

Implant size		Number of implants	Mean CBH
Diameter (mm)	Length (mm)		
4.3	8	19	5.3
4.3	10	7	7.3
5	8	32	5.1
5	10	5	7.2

Result

One year post-restoration, all patients were evaluated both clinically and radiographically. All implants with the exception of one were successful and stable with an overall survival rate of 98.4%. The only implant failure happened prior to the second stage and required removal before restoration

Discussion:

Becker et al showed a 98.8% survival rate after placement of 93 implants in cases of perforated Schneiderian membrane, however they treated the perforations with either a collagen membrane or suturing. Fermergard and Astrand10 reported that accidental perforations of the Schneiderian membrane during implant preparation as evidenced by a positive Valsalva test, did not affect the success rate of the implants placed. Cricchio et al in their study of 11 implants placed in the posterior maxilla reported that all the implants resulted in either a minor or major perforation of the Schneiderian membrane, however only one implant failed overall.

Based on the results of the present study, posterior maxillary edentulous areas with reduced CBH may be successfully rehabilitated with implants that penetrate the Schneiderian membrane and extending into the maxillary antrum, provided the initial implant preparation is limited to a maximum width of 2mm and portion of implant extending into the sinus cavity is not more than 3mm