

C-19. Title: Maxillary sinus floor elevation: one-stage surgery with bone transplant and implants

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Background

After loss of teeth in the posterior maxilla, the alveolar ridge decreases by bone atrophy and pneumatization. Different strategies for implant placement have been developed using one- or two-stage procedures, which involve either simultaneous placement into the augmented sinus graft or secondary placement after reconsolidation of the bone graft.

The aim of this study is 1)evaluate the survival rate of implant, 2)to identify buccal and palatal bone level by coronal reformation of CT scans and to identify mesial and distal bone level by sagittally reformatted CT scans and 3)to assess the marginal bone level from measurements on the mesial and distal sides, and buccal and palatal sides of the implants.

Materials & methods

10 patients were selected for the sinus elevation and implant placement procedure. All patients received a radiographic (periapical), clinical, occlusal examination and computerized tomographic (CT) scans at the initial visits and 3 months after prosthetic connection. The radiographic criteria of height of the remaining alveolar bone below the sinus floor is 5-7mm.

In this study, graft of bovine hydroxyapatite(Bio-Oss[®], Geistlich Pharma AG, Wolhusen, Switzerland) was introduced and carefully packed into the sinus cavity. Following graft placement, implants(Implantium[®], Dentium, Seoul, Korea)were inserted.The lateral wall of the sinus was then covered with a membrane(Bio-Gide[®], Geistlich Pharma AG, Wolhusen, Switzerland) to prevent migration of the graft particles.

Results

The soft tissue healing was uneventful in all patients and none of the patients had postoperative complications besides normal swelling and inflammation at the surgical sites.No implants were lost in any patients during study periods.

In sagittally reformatted CT scans, the average increase of mesial bone level around the implant was 8.23 ± 1.84 mm and the that of the distal side is 8.64 ± 2.25 . In the coronal reformation of CT scans, the mean gain of buccal and palatal bone were 9.70 ± 2.03 mm and 8.70 ± 1.68 mm respectively. In periapi-

cal radiographs, the mean increase of mesial and distal bone were 7.68 ± 0.81 and 7.91 ± 1.02 respectively.

In sagittally reformatted CT scans, the average marginal bone loss around mesial side of the implant was 0.27 ± 0.24 mm and the that of the distal side is 0.21 ± 0.22 . In the coronal reformation of CT scans, the mean loss of buccal and palatal bone were 0.13 ± 0.24 mm and 0.31 ± 0.17 mm respectively.

This study used sinus augmentation with simultaneous implant placement. The one-step procedure offers the advantages of reducing the number of surgical procedures and the time needed. Various clinical investigations and case reports have indicated that, although sinus augmentation can be clinically successful with various grafting materials, autogenous bone still provides the best osteogenic potential and biomechanical properties of the regenerated bone. However, the quantitative limitations of autogenous bone harvested from intraoral sites often constrain the clinician to use autografts.

The use of periapical radiographs could be very useful to evaluate the peri-implant conditions but the peripical radiographs has some limitation in evaluating the buccal and palatal areas. The use of CT scan allows us to gain significant information and allows full tomographic examination of the sinus augmentation region.

Conclusion

The area treated with sinus elevation with simultaneous implant installation healed uneventfully. The radiographic study showed significant amount of bone gain without peri-implant radiolucency. Further clinical and radiographic long-term studies have to be done.