

LATE PROSTHODONTIC OUTCOMES AFTER ONE STAGE SINUS FLOOR ELEVATION WITH HAP GRANULES AND DENTAL IMPLANTS

G. Zigurs¹, A. Skagers¹, G. Salmis¹,

L. Berzina², R. Cimdins²

¹Institute of Stomatology, Riga Stradins University,
Institute of Biomaterials and Biomechanics,²Riga Technical University
Latvia

Objectives: There are difficulties to provide implant based prosthodontic restoration in edentulous posterior maxilla because of deficiency of alveolar bone quantity and quality. Sinus floor elevation is a commonly accepted treatment possibility. The problem concerns the choice of material between auto bone grafting and use of bone substitutes of natural or synthetic origin.

To provide a long -term stable live tissue / biomaterial composite, we used granules of synthetic porous hydroxyapatite (HA), produced in the Laboratory of Biomaterials at Riga Technical University.

Hydroxyapatite (Hap) biomaterial is a pure calcium phosphate synthesized by the reaction of Ca (OH)₂ and H₃PO₄, in aqueous solution followed by calcination of powder at 800°C for 1h after it passed and sintered for 1h at 1150-1200 °C in blocks and ground in Ø 0,5 ± 1.0 mm granulas. Porosity of such biomaterial is 35-45% and Ca/P ratio 1,66 ± 0,02.

The aim of the study was to carry out clinical and X-ray evaluation of long time outcomes after one stage sinus floor elevation with granules of synthetic porous HA.

Material and methods: Granules of HA- irregular shape, Ø 0,2- 0,4 mm, ca/P ratio 1,66, porosity 35-40%, 1,0-2,0 g for one side were inserted in maxillary sinus floor through 1,0 x 1,5 - 2,0 cm window in sinus wall after elevation of muco/periosteal layer. Afterwards SEMADOS 153 implants were inserted and primary stability was achieved. The primary stability of implants was tested by ratchets torque force (15-30 N/cm). The height of alveolar bone was 3,0-8 mm. The study involved 60 patients, (34 women, 26 men, average age 16-77), with implants inserted during the period of years 2002-2003). SEMADOS titanium implants had screw design with aluminiumoxyde and titanium sprayed coatings, diameter 3.25 (49 units), 3.75 (77 units) and 4.5 (27 units) mm, accordingly 7.5, 8.5, 10, 11.5, 13, 15 in length.

Perioperative antibiotics -amoxyclav (augmentin) 1,0 before operation and 0,625 (1,0) twice was ordered for three days. Perforation of sinus membrane with short time nasal haemorrhage was observed in 6 cases.

The two stage surgery was done in all cases. The second stage surgery was started not earlier than after 6 months. Prosthetic procedures began as early as 2 weeks after second stage surgery. Single-unit restorations and mutiple- unit prostheses (bridge) were mostly screw-retained (142 units). 11 units.were cement-retained.

Results: We observed 60 patients with 153 SEMADOS implants (different in diameter). At each visit, patients were examined for mobility of the prosthesis, gingival health, and over-all clinical function of the prosthesis. Periapical radiographs of all study implants were obtained at each recall visit and visually evaluated for peri-implant radiolucency and bone loss.

There were no complications as to wound healing or symptoms of sinus disease. After the second stage surgery prosthetic procedure was started (after 2 weeks). The primary stability was achieved in all cases. After the second stage surgery insufficient osseointegration in 2 cases was observed. The implants were removed and reimplantation was carried out according to the protocol. In 1 case the bridge prosthesis (3 units, screw-retained, on 3 implants) was removed after a 2 years wearing due to peri-implantitis diagnosed.

Conclusion: Our results of this study confirm that sinus floor elevation in one stage with Hap granules with insertion of implants in cases of residual alveolar bone 3-8 mm in height, may be the optimal method for implant based prosthetic reconstructions of the maxillae. With this method the late prosthodontic outcome may be considered as successful.