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Clinical Report on Restoration of Patient with Immediate Loaded Maxillary Restoration Supported by Zygomatic/Endosseous Implants and Mandibular Prosthesis Utilizing Three-implant Solution

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ABSTRACT

Case report of a 72-year-old patient who was wearing two removable prostheses, a maxillary complete denture and a mandibular complete denture, retained by two implants and locator attachments. The patient's medical condition is complicated. She is blind, has suffered from kidney failure and has a donated kidney. She also suffers from diabetes. The patient wished to convert both prostheses to fixed restorations. The lack of maxillary osseous tissue required the use of skeletal anchorage outside of the immediate oral cavity to retain maxillary prostheses. The current placement of mandibular implants would not allow the use of a strict stent-driven protocol and placement of prefabricated prosthesis (Trefoil, Nobel Biocare), so they were removed to allow for the placement of three endosseous implants in a specific orientation. The patient's medical history also necessitated doing both procedures simultaneously while under a general anesthetic.

Edentulism continues to be an epidemic in the United States associated with significant systemic implications.^[1]

The use of zygomatic implants has been well-documented in the literature, both in a single bilaterally placed protocol^[2-4] with anterior endosseous implants or in two bilaterally placed implants "quad zygoma" protocol.^[11-13] In each scenario, success rates range from 93% to 100% depending on the cohort.

The use of three implants to support a mandibular prosthesis is also well-documented,^[15-17] dating back to 2004, and with success rates from 90% to 100%. The introduction of the Trefoil solution by Nobel Biocare made it possible to place a final fixed restoration on the mandible in one day. This clinical report describes the application of the above options to restore a patient with fixed prostheses in one day. The follow-up is also provided, with the placement of the final restorations for both arches following the prescribed healing protocols.

The patient presented with existing complete dentures. The mandibular prosthesis was retained by two endosseous implants with locator attachments; the maxillary complete denture was supported by soft tissue. The patient wished to have implant-fixed prostheses fabricated.

Surgical Preparation

Since the patient presented with an acceptable occlusal vertical dimension and reproducible functional occlusion, the decision

was made to plan for placement of bilateral zygomatic implants and four anterior endosseous implants in the maxilla, while simultaneously utilizing the Trefoil solution for an immediate load-fixed prosthesis in the mandible.

CBCT scans were obtained to aid in the placement and planning of the endosseous implants for the maxilla and mandible. A medical grade CBCT was obtained for evaluation of the zygoma bilaterally to verify if adequate bone height and volume were present. The radiographic evaluation of the severely atrophic maxilla revealed pneumatized sinus and insufficient bone for implant placement without extensive sinus augmentation. The patient chose to utilize a graftless approach and have one zygomatic implant placed bilaterally, with endosseous implants anteriorly.

In the mandible, the existing implants would not allow the placement of the Trefoil implant system approach, which has rigid surgical guides, necessitating the tripod placement of the implants and then the placement of transitional fixed prostheses that are screw-retained.

The existing dentures were duplicated in clear acrylic. The maxillary denture was modified to serve as a guide for placement of the maxillary implants (Figure 1). Placement of the zygomatic implants is a full surgical exposure of the maxilla, the visualization of the implant trajectory and anchorage. As of the time of this case report, guided zygomatic surgery is currently being developed. The guide utilized here is to allow for the distribution of implants in a specific anterior/posterior position to maximize A-P spread and sufficient prosthetic support.

Discussion

Surgical overview/Prosthesis indexing

The decision to begin in the maxilla or mandible was determined by the fact that the center implant position in the Trefoil solution is based on the maxillary central incisor position. The maxilla was approached in standard fashion for zygoma therapy. A crest of ridge incision within the attached tissue with bilateral vertical releases just posterior to the zygomatic buttresses, vertically ending beyond the mucogingival junction and full thickness flaps were elevated, exposing the entire lateral aspect of the maxilla. The left and right zygomatic implants were planned based on the ideal maxillary tooth position of #3, #4 and #13, #14, respectively.

The osteotomies were prepared and the implants placed using standard preparation. The four anterior fixtures were prosthetically guided based on the duplicate clear denture. All of the anterior implants were Nobel Biocare Active fixtures 4.3 mm x 13 mm. All implants met the immediate load criteria of insertion torque. The zygoma implants torqued to 70 N-cm², and the conventional anterior fixtures torqued to 40-70 N-cm². Multiunit abutments were placed on all of the maxillary implants based at or occlusal to the tissue height. Comfort caps were placed to allow for a simplified soft-tissue closure. The buccal fat pad was

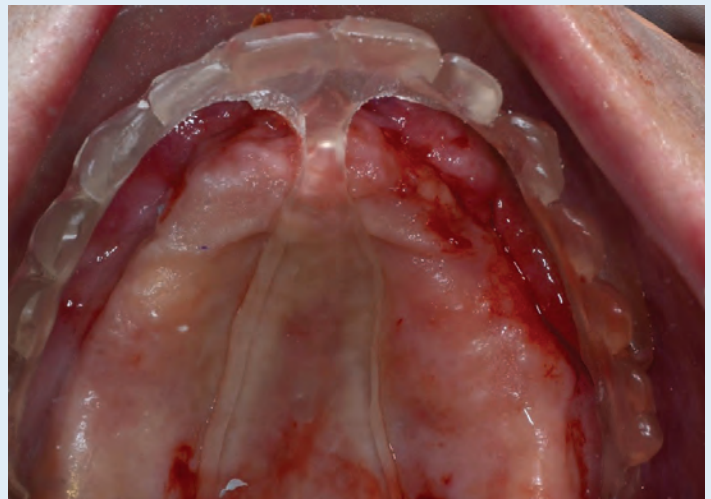


Figure 1. Maxillary surgical guide for placement of zygomatic implants and anterior endosseous implants.



Figure 2. Surgical "band-aid" in place postsurgery maintains tissue compression until prosthesis is placed.



Figure 3. Mandibular arch 48 hours postsurgery after removal of surgical band-aid. Note implant collars and soft tissue. Enables easy placement through direct visualization of implant platform.

released and brought over the zygoma implants pedicle to its base. This was sutured over the lateral aspect of the zygomatic implants to cover the extra-maxillary threads. The maxillary mucosa was then closed using interrupted stitches. All sutures were 3.0 chromic gut. The patient was managed by the dental anesthesiologist during the entire procedure and a nasotracheal intubation was used for a general anesthetic during the maxillary procedure. Due to concern for the patient's kidney function and other medical issues, the patient was managed with sedation during the mandibular procedure.

Once the maxillary prosthesis was indexed, registered and connected, the mandible underwent the Trefoil solution. A vertical reference was obtained and maintained using a Willis gauge. After local anesthesia was infiltrated to the mandible, a full-thickness flap was elevated exposing the entire mandible from the second molar on the right to the second molar on the left. The symphysis and mental foramina were completely visualized. The previously placed Nobel Biocare Replace 4.3 mm x 13 mm fixtures in sites #23 and #27 were removed using the Nobel Biocare reverse implant driver tool. Both implants were removed without difficulty and no bone loss. The bone was leveled and made parallel to the maxillary occlusal plane. The mandibular prosthesis was placed, and the vertical was confirmed using the Willis gauge, to ensure a proper amount of bone leveling was performed. Us-

ing the Trefoil protocol, the center implant and two posterior implants were placed into the anterior mandible. The insertion torque for all three implants was in excess of 40 N-Cm². The implants were indexed, and the wounds were closed in interrupted fashion using 3.0 chromic gut sutures.

Prostheses Conversion

The decision to place the maxillary implants first was made to establish the ideal occlusal plane. The Trefoil solution requires the precise placement of three implants via a stringent drill protocol with pre-manufactured guides. The critical preparation of the mandibular guide pin is dependent upon having the maxillary occlusal plane parallel to the osseous platform created during the surgical preparation of the mandible. The subsequent placement of the first osteotomy site is established with guide pin and is made perpendicular to both planes and located just lingual to the cervical areas of teeth #8 and #9. In order to achieve this, the maxilla was treated first. Following placement of the bilateral zygomatic implants and endosseous implants in sites #7 and #10, the existing maxillary denture was converted to a fixed provisional by placing multiunit abutments on all implants and provisional cylinders. The denture was then secured to the implants with prosthetic screws and the access openings were sealed. The surgical preparation of the mandibular arch was commenced, and the Trefoil protocol followed. After placement of the mandibular implants and indexing of the implant positions, healing abutments were placed, along with a "surgical band-aid" (Figure 2).

The patient returned 48 hours later for placement of the mandibular fixed prosthesis (Figures 3,4). She was followed weekly for the first month and then every two weeks for the duration of healing. After six months, the final restorative phase was begun.

Final Prostheses Fabrication

Following final impressions for the maxillary and mandibular arches, a facebow transfer and interocclusal jaw records were made. It was decided to fabricate a second Trefoil prosthesis that would ideally function with the final mandible restoration. The mandible was restored with a hybrid prosthesis design utilizing the Trefoil bar and Ivoclar Blue line teeth processed with Ivoclar Ivobase. The maxilla was restored with a hybrid prosthesis consisting of an internal milled titanium bar and denture teeth attached with an acrylic denture resin (*Procera Implant Bridge*) (Figures 4,5). A mutually protected occlusal scheme was developed. Occlusal refinement and soft-tissue contours were evaluated upon insertion. Upon follow-up, all soft tissue appeared well-adapted to the intaglio surface of both prostheses. The occlusion was stable, demonstrating consistent contacts and mutually protected occlusal function. The patient was placed on routine hygiene protocol every three months for the first year.



Figure 4. Intraoral view of immediately loaded maxillary and mandibular prostheses 48 hours postsurgery.



Figure 5. Intraoral view of final maxillary and mandibular prostheses in maximum intercuspation.

Summary

This is a case report of immediately placed and loaded maxillary and mandibular restorations utilizing a zygomatic and endosseous implant solution and a Trefoil solution for the mandible. The advantage of immediately placing fixed provisional restorations in a full-mouth rehabilitation following implant surgery provides expedited care delivery and return to a more normal function that provides tremendous psychosocial advantages for patients. It also reduces chair time and expenses when using prefabricated components, as in the case with Trefoil. The evidence supports that this is at least equal to delayed healing protocols or using grafting solutions in the maxilla. //

Queries about this article can be sent to Dr. Tuminelli at prosthodont@aol.com.

REFERENCES

1. Felton D. Complete edentulism and comorbid diseases: An update. *J Prosthodont* 2016;25:5-20.
2. Brånemark PI, Gröndahl K, Öhrnell LO, et al. Zygoma fixture in the management of advanced atrophy of the maxilla: technique and long-term results. *Scand J Plast Reconstr Surg Hand Surg* 2004;38:70-85.
3. Brånemark P-I. *The Zygomatic Fixture: Clinical Procedures* (ed 1). Gothenburg, Sweden, Nobel Biocare AB, 1998, p. 1.
4. Davo Malevez C, Rojas J, Rodriguez J, et al: Clinical outcome of 42 patients treated with 81 immediately loaded zygomatic implants: a 12- to 42-month retrospective study. *Eur J Oral Implantol* 2008;1:141-50.
5. Malo P, Nobre Mde A, Lopes I. A new approach to rehabilitate the severely atrophic maxilla using extramaxillary anchored implants in immediate function: A pilot study. *J Prosthet Dent* 2008;100:335-66.
6. Aparicio C, Ouazzani W, Aparicio A, et al. Immediate/early loading of zygomatic implants: clinical experiences after 2 to 5 years of follow-up. *Clin Implant Dent Relat Res* 2010;12:e77-e82.
7. Balshi SF, Wolfinger GJ, Balshi TJ. Retrospective analysis of 110 zygomatic implants in a single-stage immediate loading protocol. *Int J Oral Maxillofac Implants* 2009;24:335-341.
8. Chrcanovic BR, Abreu MH. Survival and complications of zygomatic implants: a systematic review. *Oral Maxillofac Surg* 2013;17:81-93.
9. Aparicio C, Ouazzani W, Garcia R, et al. A prospective clinical study on titanium implants in the zygomatic arch for prosthetic rehabilitation of the atrophic edentulous maxilla with a follow-up of 6 months to 5 years. *Clin Implant Dent Relat Res* 2006;8:114-22.
10. Kahnberg KE, Henry PJ, Hirsch JM, et al. Clinical evaluation of the zygoma implant: 3-year follow-up at 16 clinics. *J Oral Maxillofac Surg* 2007;65:2033-38.
11. Bedrossian E, Rangert B, Stumpel L, et al. Immediate function with the zygomatic implant: a graftless solution for the patient with mild to advanced atrophy of the maxilla. *Int J Oral Maxillofac Implants* 2006;21:937-42.
12. Neugarten J, Tuminelli F, Walter L. Two bilateral zygomatic implants placed and immediately loaded: a retrospective chart review with up to 54-month follow-up. *Int J Oral Maxillofac Implants* 2017;1399-1403.
13. Tuminelli F, Neugarten J, Walter L. Immediate loading of zygomatic implants: a systematic review of implant survival, prosthesis survival and potential complications. *European Journal of Oral Implantology* 2017:79-87.
14. Harpal C, Smith G, et al. A retrospective cohort study of the survival rate of 88 zygomatic implants placed over an 18-year period. *Int J Oral Maxillofac Implants* 2019: 461-470.
15. Hatano N, et al. *Clin Oral Implants Res* 2011;22:1265-9.



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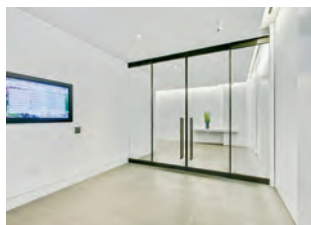
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