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The Cortically Fixed At Once Approach: A Treatment Option in an Atrophied Maxilla

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Keywords
Cortically Fixed at Once implants, Pterygoid implants, Hybrid plates, Edentulous patient, Rehabilitation.

Summary
Cortically Fixed at Once implant system are specially designed plates and screw implants which are used for extremely atrophic jaws. The plates, as well as the screw implants, are of varying design and lengths to treat different challenging cases. The hybrid plates are from titanium Grade 2 which makes them strong, thin, lightweight and highly flexible. This allows that the plates may be adapted to any bone anatomy. The hybrid plate is made of one piece solid titanium without any welds or added parts, the high fatigue strength of the titanium plate is particularly indicated for mechanically demanding situations.

A severely atrophied maxilla presents limitations for conventional implant placement. An alternative implant system that circumvents the limitations of the conventional implant system for the restoration of such cases is required.

The presented case reports describe the steps followed for the functional restoration of edentulous patients with the CF@O implant system.

Cortically Fixed at Once implant system are specially designed plates and screw implants which are used for extremely atrophic jaws. The plates, as well as screw implants, are of varying design and lengths to treat different challenging cases [1]. CF@O uses the available residual bone volume for support (the concept of tricortical support anchorage). The hybrid plates are made of titanium Grade 2 which makes them strong, thin, lightweight and highly flexible. This allows that the plates may be adapted to any bone anatomy. The plates are made of one piece solid titanium without any welds or added parts, the high fatigue strength of the hybrid plate is particularly indicated for mechanically demanding situations such as in the canine and zygomatic region of the maxilla and the mandibular ramus.

A severely atrophied maxilla presents limitations for conventional implant placement [2-6]. Various anatomical reasons limit the use of the conventional implant for restoring some edentulous spaces [3,4,7]. In these situations, an alternative implant system that circumvents the limitations of the conventional implant for the restoration of such cases is required. Various implant systems such as eposteal, subperiosteal, endosteal, mini and zygomatic implants, plus various regenerative grafting procedures are many current possible options for the management of atrophic jaws [2,4,8-12]. In spite of these many options, some severe atrophic jaw cases defile the current treatment options.

The CF@O implant system consists of several types of components specifically developed for different locations in the jaw. The Pterygoid implants and the Hybrid plates are developed to be placed in the posterior zones of the maxilla. The compressive implants with specific macro- and micro-threads are mostly in the frontal bone of the upper and lower jaw. With this implant system, extensive invasive procedures, such as onlay grafts, free or microvascular bone grafts, transport distraction osteogenesis, apposition grafts with or without a Le Fort I osteotomy with their attendant comorbidity are avoided [13,14,15-19].

The CF@O protocol requires no graft, sinus lift nor nerve

displacements, these safe patients from lengthy surgeries, long treatment time, and some morbidity [15,16].

The following case reports describe procedures where CF@O was used to rehabilitate edentulous jaw.

Case presentation

The patient is a 63-year-old female who wanted fixed teeth in the maxilla. The patient had previously visited many doctors who proposed various treatment options such as sinus lifts or bone graft among others before she visited our clinic.

A clinical examination showed an edentulous upper arch with a resorbed ridge, and the lower arch showed few teeth with periodontal disease. Radiographic examination using an orthopantomogram showed an edentulous upper jaw with moderate vertical bone resorption in the front and severe vertical resorption in the premolar and molar region.

In the lower jaw, several teeth were present in the frontal region and in the right lateral region. Most of the teeth show a moderate to severe bone loss suggestive of chronic periodontitis. Figure 1 shows the panoramic radiograph of the patient at presentation.

Treatment Plan: From a prosthetic point of view, the patient desired a fixed prosthetic solution. In the upper jaw, a combination of two pterygoids, two one-piece implants and four hybrid plates was proposed. The patient agreed to this treatment plan. The planned treatment is shown on a model in figure 2.

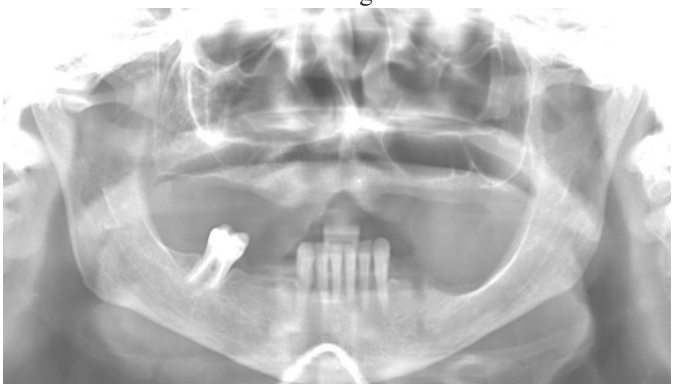

Figure 1: Panoramic radiograph of patient at presentation.

Figure 2: Model showing treatment plan for the patient above.

The patient was sent for a computed tomography (CT) scan in order to estimate the amount of bone present and to view the surrounding structures. After CT scan a date was fixed for the implant surgery which was planned to be done under local anesthesia. As a premedication patient was given 100 mg Atarax two hours before implant surgery.

At surgery, an open flap was made from the left tuberosity along the crest till the canine region in the maxilla. The flap was reflected on the vestibular side in positions 26 and 27 of the zygomatic arch; flap was also reflected in the palate. Pterygoid implant C35/20mm (ROOTT – implant Trate ag.) was inserted at position 28 on the left pterygoid plate with a 50N Torque. One hybrid plate HENGG-1 (Highly Efficient No Graft Gear) was adapted to the bone anatomy and fixed with osteosynthesis screws on the zygomatic bone at position 26. The plate was fixed with osteosynthesis screws and covered with MatriboneR. In the premaxillary region, a hybrid plate type HENGG-2 was adapted to the bone and fixed with osteosynthesis screws.

In the front region, two one-piece implants C35/10 were installed on the maxillary bone with a 50N torque.

The procedure was quite similar for the right side. A pterygoid implant C35/20mm (ROOTT – implant Trate ag.) was inserted at position 18 on the right pterygoid. A plate HENGG-1 was installed in position 16 and another plate HENGG-4 at the premaxillary region Figure 3.

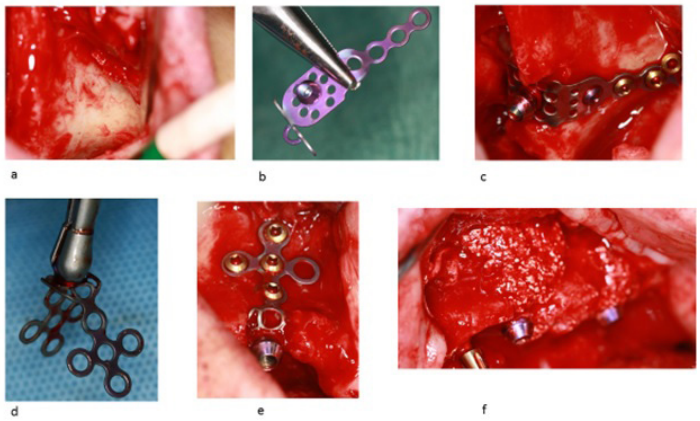

Figure 3: Surgical procedure and implant placement (a – f).

The configuration of HENGG-4 in form of a cross allows a special strong fixation in the premaxilla as the bone quality in this region is poor.

The flap was then closed on the right with polytetrafluoroethylene polymer (PTFE) monofilament non-absorbable suture.

After an implant placement, the first bite registration was done with the old prosthesis of the patient. Then transfer coping was inserted and an impression was taken with silicone immediately after the surgery Figure 4. For the pterygoid implants a transfer coping with open tray was used, so the impression tray was cut at the end

to receive the long transfer coping, while on the other implants a closed tray was used. A temporary resin bridge was made at the chairside and fixed on the maxilla with temporary cement. After surgery, the patient was placed on antibiotics (Amoxicillin 1000 mg for 7 days), painkiller (Dafalgan forte 1-2 a day if necessary and an injection of cortisone Diprophos 2ml /5mg in the masseter muscles.

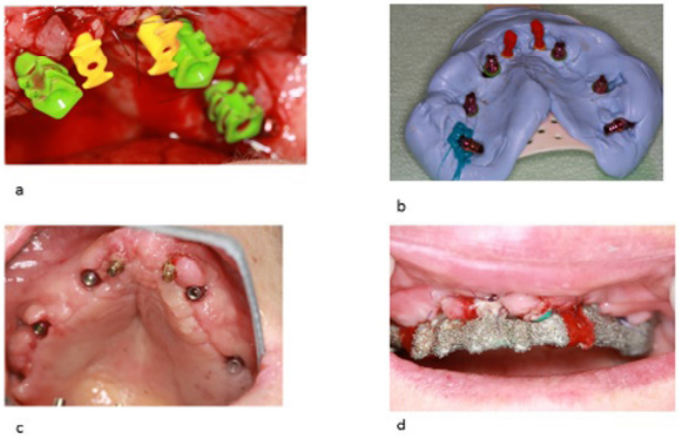

Figure 4: Bite registration and impression taken procedure.

Four days after the framework, a try-in was done and a new bite registration was taken. The laboratory technician was present at this appointment to check the smile line and to choose the teeth colour. Due to the less than an optimum state of the maxilla bone, a metal acrylic bridge was planned for restoration.

Six days after the try-in an appointment for prosthesis delivery was given. In the maxilla, the metal acrylic bridge was screwed and cemented with a temporary cement in the front (Figure 5).

Figure 5: Clinical photograph of patient after bridge delivery.

The patient was reviewed after 2 weeks. Thereafter, patient was scheduled for follow-up at 3 months and then every 6 months.

Discussion

The presented case report describes steps followed for the functional restoration of an edentulous patient with CF@O implant system. Due to the above-described technique, the patient could receive in a short time fixed teeth using a minimally invasive procedure. Where traditional implant methods take several months to complete, the CF@O approach achieves the same result in days without the need for additional surgery. Rehabilitation of seemingly difficult edentulous cases was achieved within a short period of time without additional invasive procedures such as bone graft and sinus lift.

Figure 6: Panoramic radiograph and clinical photograph of patient at completion of treatment.

References

1. Henri Diederich, Alexandre Junqueira Marques, Léo Guimarães Soares. Immediate Loading of an Atrophied Maxilla Using the Principles of Cortically Fixed Titanium Hybrid Plates. Advances in Dentistry & Oral Health. 2017; 3: 001-003.
2. Ali SA, Karthigeyan S, Deivanai M, et al. Implant rehabilitation for atrophic maxilla: a review. J Indian Prosthodont Soc. 2014; 14: 196-207.
3. Bosse LP, Taylor TD. Problems associated with implant rehabilitation of the edentulous maxilla. Dent Clin North Am. 1998; 42: 117-127.
4. Candel E, Penarrocha D, Penarrocha M. Rehabilitation of the atrophic posterior maxilla with pterygoid implants: a review. J Oral Implantol. 2012; 38: 461-466.
5. Jivraj S, Chee W, Corrado P. Treatment planning of the edentulous maxilla. Br Dent J. 2006; 201: 261-279.
6. Sevetz EB Jr. Treatment of the severely atrophic fully edentulous maxilla: the zygoma implant option. Atlas Oral Maxillofac Surg Clin North Am. 2006; 14: 121-136.
7. Mericske-Stern RD, Taylor TD, Belser U. Management of the edentulous patient. Clin Oral Implants Res. 2000; 11: 108-25.
8. Cordaro L, Torsello F, Mirisola dT, et al. Rehabilitation of an edentulous atrophic maxilla with four unsplinted narrow diameter titanium-zirconium implants supporting an overdenture. Quintessence Int. 2013; 44: 37-43.
9. Malo P, Nobre MA, 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: 354-366.
10. Mani V, Sivaprasad KK, George A, et al. Hybrid Implant: A Novel Implant System. J Maxillofac Oral Surg. 2015; 14: 720-727.
11. Penarrocha-Oltra D, Candel-Marti E, Ata-Ali J, et al. Rehabilitation of the atrophic maxilla with tilted implants: review of the literature. J Oral Implantol. 2013; 39: 625-632.
12. Sherry JS, Balshi TJ, Sims LO, et al. Treatment of a severely

atrophic maxilla using an immediately loaded, implant-supported fixed prosthesis without the use of bone grafts: a clinical report. J Prosthet Dent. 2010; 103: 133-138.
13. Cheung LK, Zhang Q, Zhang ZG, et al. Reconstruction of maxillectomy defect by transport distraction osteogenesis. Int J Oral Maxillofac Surg. 2003; 32: 515-522.
14. Nystrom E, Nilson H, Gunne J, et al. Reconstruction of the atrophic maxilla with interpositional bone grafting/Le Fort I osteotomy and endosteal implants: a 11-16 year follow-up. Int J Oral Maxillofac Surg. 2009; 38: 1-6.
15. Sjostrom M, Sennerby L, Nilson H, et al. Reconstruction of the atrophic edentulous maxilla with free iliac crest grafts and implants: a 3-year report of a prospective clinical study. Clin Implant Dent Relat Res. 2007; 9: 46-59.
16. Ugurlu F, Yildiz C, Sener BC, et al. Rehabilitation of posterior maxilla with zygomatic and dental implant after tumor resection: a case report. Case Rep Dent. 2013; 2013: 930345.
17. Yaremchuk MJ. Vascularized bone grafts for maxillofacial reconstruction. Clin Plast Surg. 1989; 16: 29-39.
18. Marti E, Carrillo-Garcia C, Penarrocha-Oltra D, et al. Rehabilitation of atrophic posterior maxilla with zygomatic implants: review. J Oral Implantol. 2012; 38: 653-657.
19. Maria Prados-Privado, Henri Diederich, Juan Carlos Prados-Frutos. Implant Treatment in Atrophic Maxilla by Titanium Hybrid-Plates: A ElementStudy to Evaluate the Biomechanical Behavior of Plates Metals. 2018; 8: 573.