Case Report

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A Treatment Approach to Unilateral Sinusitis with a Cutaneous Fistula: Case Report on a Complication Involving a Zygoma Quad Restoration Implant

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Abstract

The rehabilitation of severely resorbed maxillae containing zygoma implants is a non-grafting treatment option that presents many advantages for patients. It is not, however, free from complications and the most frequent of those reported in the literature is sinusitis. A cutaneous fistula is a less frequent complication, but one that requires more than routine dental treatment and usually calls for maxillofacial surgery. Here, we present the case of a 64-year-old male suffering from sinusitis and with a cutaneous periorbital fistula as a complication; this occurred 8 years after the patient received dental rehabilitation with four zygomatic implants. This clinical report suggests that the trans-sinus apicoectomy of ZIs. Combined with antrostomy, presents satisfactory initial results and is a viable, one stage surgical alternative to treat sinusitis with cutaneous fistula, in the context of a complication involving a fixed dental prosthesis restoration of ZIs.

Keywords: Zygoma implant, Zygoma quad, Implant complications, Sinusitis, Cutaneous fistula.

Abbreviations: CBCT: Cone Beam Computed Tomography; TNLA: Trans nasal Lower Antrostomy; TZIA: Trans-sinus Zygoma Implant Apicoectomy; ZIs: Zygoma Implants

Introduction

Zygomatic implant therapy was introduced as a way of accomplishing dental implant osseointegration in difficult cases without the need for bone grafting [1]. The procedure reduces morbidity, particularly in elderly patients and those with generally compromised health, in cases in which bone grafting would otherwise be hazardous. The total treatment time and cost are also be reduced in comparison with traditional rehabilitation therapy such as bone grafts [2]. Since the classical description of surgical placement

using ZIs by Brånemark (1998), several authors have made improvements and modifications to the original technique [3]. The aim of these modifications has been to avoid complications and simplify the technique. Hence, Stella & Warne (2000) introduced the sinus slot technique in order to exteriorize the implant and thereby avoid the intrasinus complications reported in the original technique described by Professor Brånemark [4]. Since then, several authors have reported different degrees of technical refinements including the exteriorizing of ZIs from the maxilla [5].

Increasing the number of ZIs used in rehabilitation has also been proposed [6]. The use of immediate loading protocols has been shown to alter previous quality of life scores in treated patients [7]. However, this technique has also produced complications: the probability of a maxillary sinus presenting sinusitis is 2.4%; the chance of soft tissue infection around implants is 2.0%; and the risk of paresthesia of the infraorbital or zygomaticus-facialis nerve is 1% [8].

The aim of this study is to find a conservative approach treatment from the prosthesis point of view to treat severe complications successfully. The total release of implants has been described in the treatment options by the literature, but total function loose and the possibility to create an iatrogenic oro-antral communication difficult to close is the main concern.

Case Report

We present the case of a 64-year-old Caucasian male smoker (consuming more than 10 cigarettes/day) and has type II diabetes. He was under medical treatment with oral hypoglycaemians and suffered hypertension controlled by medical treatment. The patient had received treatment at a private dental clinic, 8 years earlier. He had a fixed bridge supported by four ZIs (Ti-Unite®, Nobel Biocare AB, Göteborg, Sweden). A provisional screwed over-denture was delivered 24 hours after initial surgery.

The patient had not been subjected to any kind of control at the clinic after the definitive dentures were installed 6 months after surgery. The patient came to the emergency unit of our hospital with periorbital erythema and a cutaneous fistula with purulent exudate on the face (Figure 1). CBCT scan were performed (Figure 2, 3) which revealed sinus occupation (Figure 4) and leucocytosis, with 18,000 cells in the routine blood analysis. Orthopantomography (Figure 5).

Figure 1: Facial abscess in the periorbital skin, previous to the spontaneous fistulisation.

Figure 2: CBCT image.

Figure 3: CBCT- 3D reconstruction.

Figure 4: Sinus occupation with purulent exudate.

After 5 days of oral antibiotic treatment, which gave poor results, patient came back again to the hospital showing a spontaneous fistula on the thin palpebral skin, treated with antiseptic topic solution and facial apisit by his primary care physician four days after our antibiotic initial treatment. See the patient at this stage in figure 6.

Figure 5: Orthopantomogram showing the distribution of zygoma quad implants, with left sinus radiological hyperdensity. Note the superimposed left medial implant with its apex in the orbital fossae.

Figure 6: 1 day after spontaneous fistulisation on the lower periorbital thin palpebral skin, obtaining a hemo-purulent exudate but the erythema and oedema was persistent around the periorbital region.

The same day a surgical procedure was performed to treat the complication at our oral and maxillofacial unit, under general anaesthesia.

The surgical procedure began with a left-sided Caldwell-Luc mucosal incision which respected the infraorbital nerves. An incision was made to lift a full-thickness flap and expose the surgical site in order to access the ZIs in the extrasinus path (Figure 6). With around carbide surgical bur and profuse irrigation we performed a trans-sinus

hemisection of the two left-hand implants, to complete the ZIs. Apicoectomy, thereby reaching the purulent exudate shown in the image (Figure 7). We then carefully lifted the apical parts of the implants anchored in the periorbital zygomatic bone (Figure 8). The upper implant was removed using diamond-coated premolar forceps (KLS Martin Ergo®, Gebrüder Martin GmbH, Germany). The operation respected the inferior parts of both implants, which were anchored in the left maxillary part of the crestal bone (Figure 9).

Figure 7: Subperiosteal view after lifting the mucoperiosteal flap.

Figure 8: Trans-sinus zygoma implant Apicoectomy (TZIA) made with a surgical (027 in.) round tungsten-carbide bur (Hager & Meisinger GmbH, Neuss, Germany). Purulent sinus exudate flowed after cutting the implant. We cut into both left-sided implants.

Figure 9: The apical zygoma portion with the adhesion of hemo-purulent exudate to the treated surface of the implant (Ti-Unite®Nobel Biocare AB, Göteborg, Sweden). Note the signs of infection in the holes in the apical implant.

A trans nasal lower antrostomy (TNLA) was performed in the left maxillary bone accompanied by suction of the purulent exudate in order to re-establish sinus ventilation and restore normal sinus physiology. We left a gauze with ophthalmic ointment Chlortetracycline hydrochloride (Oftalmolosacusí® Halcón-Cusí S.A. Barcelona, Spain) in a trans nasal apposite for 48 hours to retard the natural tendency to close and also in order to have a postoperative control of potential nasal bleeding.

Figure 10: Postoperative panoramic X-ray showing the double zygoma implant apicoectomy keeping the dental prosthesis functionality and without sinusal hyperdensity in the post-surgical follow up.

We prescribed oral antibiotic post-surgical treatment during 8 days (Augmentine® 875-125 mg amoxicillin-clavulanic, GSK AB. Madrid, Spain) every 8 h. Every two-

weeks during a period of four months patient was visited in our hospital, small scar on the thin sub palpebral skin was note in the healing of the cutaneous fistula from the beginning (Figure 11).

Figure 11: Facial scar after 6 months of healed the cutaneous fistula, (see the arrow).

Almost every month was performed a control panoramic X-ray. No clinical signs of sinusitis or radiological hyperdensity were detected with 1 year follow up.

Discussion

The concept of implant periapical pathology was introduced in 1993 by Sussman & Moss, as an infectious-inflammatory disorder of the tissues surrounding the apex of a dental implant [9]. Ayangco and Sheridan performed periapical surgery over a conventional implant and they also mentioned the possibility of sectioning the implant apex in those cases where complete removal of the granular tissue is not assured, and when the location involves the maxillary sinus or nasal cavity [10].

We hypothesised the cutaneous fistula may be a particular ZIs. Periapical pathology, and that's why we propose a ZIs. Apicoectomy to treat it, in the same way dental periapical lesions may be treated surgically with dental apicoectomy. However, the cutaneous fistula often exceeds the therapeutic range of conventional dental practice, usually calling for treatment by oral and maxillofacial surgeons, plastic surgeons or

ENT medical specialists. The main reason for that is the differential magnitude between an intraoral parulis versus an external skin fistula with further aesthetic concerns. The zygoma quad implant modality distribution is a particular case in which we opt for double apicoectomy, otherwise we do not know which implant is the main responsible of cutaneous fistula.

To perform the ZIs. apicoectomy we consider safer the Caldwell-luc approach instead the external approach, avoiding the aesthetic concerns of potential damage over facial nerve orbital branches, as well as minimizing the facial scar and zygoma bone cortical defect.

In other hand, sinusitis seems to be the most prevalent postoperative complication associated with ZIs. ranging from 1.5% to 18.42% [11]. Postoperative complications with ZIs. include maxillary sinusitis, soft tissue infections, paresthesia and oro-nasal fistulas [12]. Becktor et al. reported a couple of causative factors involved in the physiopathology of sinusitis in the context of a fixed prosthesis with ZIs. The internal threaded abutment screw chamber of the zygomatic implant seems to create communication between the oral cavity and the antrum, which may result in sinusitis. Another causative factor may be the lack of osseointegration: bone-to-implant contact at the margins in the palatal area and functional loading resulting in the transversal mobility of the long coronal part of the ZIs. This could imply a greater risk of communication between the antrum and the oral cavity and thereby cause sinusitis [13].

To treat the sinusitis in ZIs. fixed restorations, some authors consider the antibiotics and/or meatotomies and repositioning the soft tissue without the removal of the stable ZIs [14-16]. If the infection does not resolve with one or two rounds of oral antibiotic therapy, there may be a concern that the implant is acting as a foreign body and is responsible in part for the persistence of the infection, and its removal may be indicated [17]. However, the ZIs extraction creates a compromised premaxilla and may give rise to oroantral communication as well as the functional loosening of dental prostheses [18].

A conservative approach to keeping dental prostheses functionality is an important issue for the patient. The proposed treatment had one year follow up without any symptom and to totally resolve the problem of the cutaneous fistula.

The combination of ZIs. Apicoectomy (to eliminate the foreign body that maintains the cutaneous fistula) and trans-nasal inferior antrostomy (to provide a drainage of sinus) may help to prevent the loss of dental prosthesis function while also re-establishing normal sinus physiology and ventilation in those cases we find together sinusitis and cutaneous fistula. This one step surgical treatment is located in the middle way between antibiotics/meatotomies and total extraction of the implants.

The main limitation of our article is that it is a single case report; it would be necessary to do more, similar studies in order to confirm our results. The absence of a control group limits the scientific evidence relating to the results obtained from our treatment compared to other cases; we must therefore be careful when drawing conclusions. Furthermore, few of the published works cited in the bibliography refer to the treatment of these complications. For this reason, we think that more contributions will be necessary in this controversial field. However, sinus infections with specific clinical features are more likely to recur and we must emphasise that radiographic follow-up and maintenance protocols are essential since recurrence is unpredictable. Further long-term follow-up studies involving larger samples are also needed to confirm these findings.

Conclusions

The combination of ZIs. trans-sinus apicoectomy combined with trans nasal lower antrostomy presents satisfactory initial results and is a viable surgical alternative to treating sinusitis with cutaneous fistula within the context of endosseous zygoma implant fixed restorations.

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This work is original and has not been published elsewhere, nor is it currently under consideration for publication elsewhere.

Authors' contributions

The authors were involved in the writing of the manuscript and the patient clinical care. All of the authors have read and approved the final manuscript.

Ethics approval and consent to participate

Consent for publication: written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

Competing interests: The authors declare that they have no competing interests.

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