

Periorbital infection and fistula after placement of zygomatic implants: a case report and review

Sormani Bento Fernandes de Queiroz 1, Cassius Guilherme Farina 2, Jaqueline Alves do Nascimento 3

¹ Director, Post-Graduation Program of Oral Implantology, Instituto Cearense de Ensino Odontológico (ICEO), Fortaleza, Brazil.

² Professor, Post-Graduation Program in Oral Implantology, Instituto de Cearense de Ensino Odontológico (ICEO), Fortaleza, Brazil.

³ Research and Student, Pos-Graduate Program in Oral Implantology, Prosthodontics and Periodontology, Instituto de Cearense de Ensino Odontológico (ICEO), Fortaleza, Brazil.

*Corresponding Author: Jaqueline Alves do Nascimento. Padre Valdevino Street, nº 276. Zip-code: 60135-041 – Fortaleza, CE, Brazil. Email: jaquelinealves_10@hotmail.com.

Research Ethics Committee Approval (if necessary): We declare that the patient approved the study by signing an informed consent form and the study followed the ethical guidelines established by the Declaration of Helsinki.

Received on: Mar 15, 2022. Accepted on: Apr 10, 2022. Available online: Apr 11, 2022.

Abstract

Zygomatic implants are a good alternative to severely atrophic maxilla prosthetic treatment, but complications can result from their placement. Skin fistulas are extremely rare complications of zygomatic implants, but its management can be challenging. Skin complications can happen when the apex of the zygomatic implant protrudes above the limits of zygomatic bone. To prevent its occurrence, careful planning must be done. The surgeon must control the final position of the implant at the appropriate length carefully. If infection or cutaneous fistula occurs, surgery to cut off the apex of the implant is indicated, either intra- or extra-orally. The aim of this case report was to describe the case of cutaneous fistula after Quad Zygoma treatment of extreme maxillary bone atrophy. A 56-year-old woman developed a left periorbital fistula 4 months after the placement of 4 zygomatic implants. Implant apex was palpable under the skin of zygomatic bone body. We opted for extra-orally cut off the implant tip above the outer cortical of the zygomatic bone. Postoperative course was uneventful and the patient had no more signs and symptoms of infection or fistula.

Keywords: Zygomatic implants; Complications; Infections; Fistula.

Introduction

Zygomatic bone for anchorage of implants together with conventional

implants is a good treatment alternative for the rehabilitation of severely resorbed maxilla [1]. Zygomatic implants have several advantages, such

as simplification of treatment, cost reduction, lower execution time and less patient morbidity, compared to reconstructions of atrophic maxilla with autogenous grafts [2-3]. However, placement of Zygomatic implants is not free of risks, and many complications have been reported in the literature, such as sinusitis, orbital penetration, nerve paresthesia and infections [4].

Cutaneous complications after the placement of zygomatic implants are extremely rare, with only 4 case reports in the current literature, 3 of which with the presence of cutaneous fistulas [5-7, 12]. The aim of this case report was to describe the case of cutaneous fistula after Quad Zygoma treatment of extreme maxillary bone atrophy.

Case report

A 56-year-old woman was referred to our clinic to implant-supported prosthetic treatment of edentulous maxilla. A thorough clinical and computed tomography evaluation showed an extremely atrophic maxilla, not allowing placement of conventional implants. Four zygomatic implants were placed accordingly, and healing occurred uneventfully.

Eight months after surgery, the patient presented periorbital edema and discomfort over the body of the left zygomatic bone. The implant tip was palpable under the skin, but the implant was stable and the maxillary sinus was clean. We prescribed antibiotic (Amoxilin 875mg+ clavulanic acid twice

a day, 10 days) and non-steroidal anti-inflammatory (Nimesulid 400mg once a day, 5 days), with considerable improvement of symptoms. One month later, patient presented with a nodular periorbital inflammatory lesion (Figure 1A).

Again, antibiotic and anti-NSAIDs were administered, and suppuration occurred through the fistula. After one week, when there were no more signs of drainage through the fistula, we performed the surgery to remove the protruded part of the zygomatic implant and curettage of inflammatory tissue in the area through an infra-palpebral approach following an expression line in the area, for a better aesthetic result (Figure 1A to E).

After the skin incision, a supra-orbicular, subcutaneous dissection was carried out, exposing the orbicularis oculi muscle just below the skin (Figure 1B). At that point, we made the introduction of delicate iris scissors, opening the muscle fibers until the underlying bone. The scissor was then directed laterally, creating a sub-orbicular tunnel towards the lateral extremity of the muscle, until the tip of the scissor appeared on the surface. Then, the muscle fibers were incised, exposing the periosteum over the zygomatic bone.

The periosteum was incised, exposing the apex of the implant that was above the outer cortical the zygomatic bone (Figure 1C). Carefully, we cut off the 5mm apical part of the

implant that protrude beyond the bone limit with a carbide burr under copious irrigation with saline. Then, the metal and bone irregularities were trimmed with a round burr and the cavity was washed several times to remove bone and metal debris from the area and a

plane-by-plane suture was done (Figure 1C and 1D). The postoperative period occurred without complications, the area of the fistula healed well and with acceptable aesthetics and the patient continued with the implant-supported prosthetic treatment (Figure 1E).

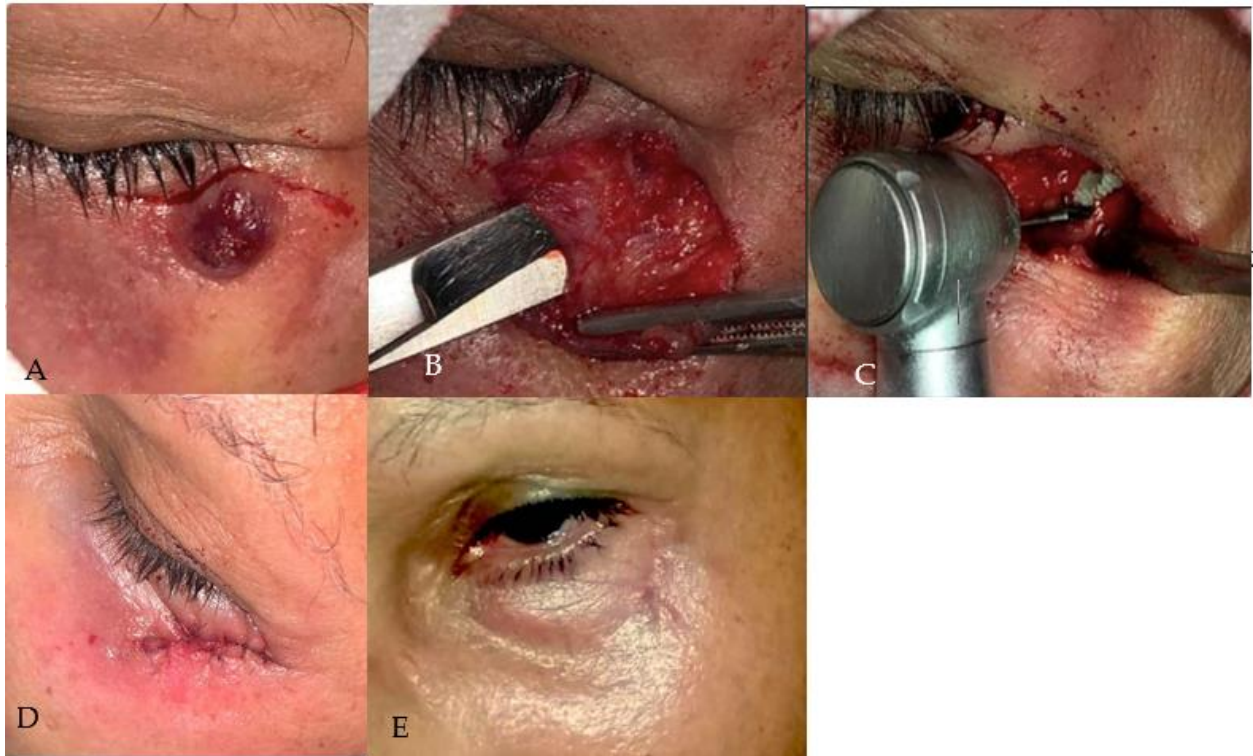


Figure 1. A to E. Sequence of the surgical approach to apicectomy of protruded apex of left zygomatic implant. shows 6-month follow-up.

Discussion and Conclusion

Although zygomatic implants have proven to be an excellent treatment option for extreme atrophic maxillas, it demands high technical and surgical experience and skills [4-5]. Complications are not uncommon [6-7,

12], although most of them do not compromise the stability of the implants, and the need for removal is rare [6]. There are only 4 reports of cutaneous complications associated with zygomatic implants in the literature [5-8], three of them cutaneous fistulas (Table 1).

Table 1. Cases of Cutaneous Complications of Zygomatic Implants Reported in the Literature.

| Author/ Year | Sex | Age | Nº of ZI | NºZI affected | Onset of Symptoms | Presence of Fistula | Treatment/ Surgical Approach | Outcome |
|---------------------------------------|-----|-----|-------------|------------------|---------------------------------------|------------------------|--|--|
| Garcia- Garcia et al, 2017 [5] | F | 59 | 4 | 2 | 8 months left 31months right | Yes | ZI apicectomy/ Extraoral | healing |
| Tzerbos et al, 2016 [6] | F | 37 | 2 | 1 | 12 months | Yes | ZI Apicectomy/ Extraoral | healing |
| Dawood and Kalavresos, 2017 [7] | F | 59 | 3 | 2 | 9 months | Yes | Left: apicectomy/ extraoral Right: trimming/intraor al | healing |
| Van Camp et al, 2017 [8] | F | 54 | 4 | 2 | 4 years | No | ZI trimming/ intraoral | Immediat e: Orbital hematom a; Long Term: healing |
| Present Study | F | 56 | 4 | 1 | 8 months | Yes | ZI apicectomy/ extraoral | Healing |

Similarly to our case report, the cases reported in the literature review are related to implants with apex above the outer cortical of the zygomatic bone, becoming palpable under the skin. The authors of two of the case report believe that contamination from the mouth or sinus during drilling and inadequate irrigation of the subperiosteal debris after the last drill was used may have caused the infection and fistula [5-7].

Other hypothesis that the aseptic necrosis was due to excessive heat generated on bone due to the long because of deficient cooling due to the length of zygomatic implant drill or overtorquing during implant placement [6-9]. We think it's more likely that the

primary causal factor is the protruded apex of the zygomatic implant causing chronic irritation and inflammation in the overlying skin, eventually becoming infected and fistulated. The skin on the zygomatic bone is in constant movement by the action of the cutaneous muscles, and this certainly contributes to the irritative trauma of the underlying implant tip.

In our point of view, this is similar to when a patient present pain and discomfort in plates and screws placed to treat maxillofacial fractures. According to Orringer et al. [9], palpable hardware is an indication that soft tissue erosion is impending, which can lead to

inflammation, infection and even plate exposure.

If the implant is stable and osseo integrated, cutting off the protruded part of the zygomatic fixture at the level of the zygomatic bone is the treatment of choice when the tip is palpable under the skin and causes discomfort, pain, infection or fistula [5-7, 9]. If an active suppuration exists through the fistula, we think it's better prescribe antibiotics and make the surgery later.

Apicectomy of conventional implants that present processes at the apical level proved to be viable and effective in solving these processes, without the need to remove the implant [11]. Cutting the apex of zygomatic implants can be done intraorally, but visualization and surgical access can be quite difficult [5-7, 9-10, 12].

In fact, the case presented was the first we did extraorally and we consider it better in terms of visualization and access to perform the procedure. Obviously, extra-oral scar is disadvantageous, but making the incisions according to the cutaneous tension lines, dissecting by planes with proper handling and layered closure can give an almost imperceptible scar.

The best way to handle a surgical complication is to prevent its occurrence. Thus, to avoid implant apex protrusion, a thorough surgical planning based on computed tomography scans and implant planning software is of utmost importance [5]. This allows us to make

measurements that will give us an idea of the length of the zygomatic implant to be placed. In addition, surgical execution must be accurate, especially when measuring the length site made for the placement of the implant. When inserting the measurement probe, we palpate extraorally to feel the probe's tip under the skin when it passes through the zygomatic bone outer cortical.

References

- [1] Rosenstein J, Dym H. Zygomatic Implants: A Solution for the Atrophic Maxilla. *Dent Clin North Am.* 2020 Apr;64(2):401-409. doi: 10.1016/j.cden.2019.12.005. Epub 2020 Jan 25. PMID: 32111277.
- [2] Araújo PP, Sousa SA, Diniz VB, Gomes PP, da Silva JS, Germano AR. Evaluation of patients undergoing placement of zygomatic implants using sinus slot technique. *Int J Implant Dent.* 2016 Dec;2(1):2. doi: 10.1186/s40729-015-0035-x. Epub 2016 Jan 13. PMID: 27747694; PMCID: PMC5005733.
- [3] Aparicio C, Ouazzani W, Hatano N. The use of zygomatic implants for prosthetic rehabilitation of the severely resorbed maxilla. *Periodontol* 2000. 2008;47:162-71. doi: 10.1111/j.1600-0757.2008.00259.x.
- [4] Chrcanovic BR, Albrektsson T, Wennerberg A. Survival and Complications of Zygomatic Implants: An Updated Systematic Review. *J Oral Maxillofac Surg.* 2016;74:1949-64.

- [5] Garcia Garcia B, Ruiz Masera JJ, Zafra Camacho M. Bilateral Cutaneous Fistula After the Placement of Zygomatic Implants. *Int J Oral Maxillofac Implants*. 2016;31:e11-4.
- [6] Tzerbos F, Bountaniotis F, Theologie-Lygidakis N, et al. Complications of Zygomatic Implants: Our Clinical Experience with 4 Cases. *Acta Stomatol Croat*. 2016;50:251-257.
- [7] Dawood A, Kalavresos N. Management of Extraoral Complications in a Patient Treated with Four Zygomatic Implants. *Int J Oral Maxillofac Implants*. 2017;32:893–896.
- [8] Van Camp P, Vrielincka L, Gemelsb B, Politis C. Intraorbital hemorrhage following a secondary intervention at integrated zygomatic implants: A case report . *Int J Surg Case Rep*. 2018;43: 21–24.
- [9] Orringer JS, Barcelona V, Buchman SR. Reasosn for removal of rigid internal fixation devices in craniofacial surgery. *J Caraniofac Surg*. 1998;9: 40-4
- [10] Nagase DY, Courtemanche DJ, Peters, D.A. Plate removal in traumatic facial fractures:13-year practice review. *Ann Plast Surg*. 2005; 55:608-11.
- [11] Balshi S, Wolfinger GJ, Balshi TJ. A retrospective evaluation of a treatment protocol for dental implant periapical lesions: Long-term results of 39 implant apicoectomies. *Int J Oral Maxillofac Implants*. 2007;22:267–272.
- [12] Shen Y, Dai Q, Tao B, Huang W, Wang F, Lan K, Wu, Y. Real-Time Dynamic Navigation System for the Precise Quad-Zygomatic Implant Placement in a Patient with a Severely Atrophic Maxilla. *Journal of Visualized Experiments: Jove*, (176). 2021.

Conflict of interest: The author declares no conflicts of interest associated with this manuscript.

Acknowledgements: We thank very much the whole team for the excellent multidisciplinary management of the case, and the patient for having trusted in our work and accepting the publication of this case report.

Funding: None.

How to cite this article: Queiroz SBF, Farina CG, Nascimento JA. Periorbital infection and fistula after placement of zygomatic implants: a case report and review. *Brazilian Journal of Case Reports*. 2022 Jan-Mar;02(2):64-69.