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

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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 it’s 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 trough 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 supraorbicular, 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 suborbicular 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).
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Table 1. Cases of Cutaneous Complications of Zygomatic Implants Reported in the Literature.

| Author/Year                  | Sex | Age | Nº of ZI | Nº ZI affected | Onset of Symptoms | Presence of Fistula | Treatment/Surgical Approach | Outcome |
|------------------------------|-----|-----|----------|----------------|--------------------|----------------------|------------------------------|---------|
| Garcia-Garcia et al, 2017 [5]| F   | 59  | 4        | 2              | 8 months left 31 months right | Yes                  | ZI apicectomty/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/intraoral | healing |
| Van Camp et al, 2017 [8]    | F   | 54  | 4        | 2              | 4 years            | No                   | ZI trimming/extraoral       | Immediate Orbital hematoma Long Term: Healing |
| Present Study               | F   | 56  | 4        | 1              | 8 months           | Yes                  | ZI apicectomty/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 osseointegrated, 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.

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