

Dental implant displacement into the mandibular body: a case report

Deslocamento de implante dentário para o corpo mandibular: relato de caso

Desplazamiento de implantes dentales en el cuerpo mandibular: reporte de caso

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Abstract

Posterior mandible region is considered a highly predictable place for primary stability during dental implant placement. Although, this region can present a significant decrease in bone density, which can lead to implant dislocation during insertion. The present case reports an unusual dislocation of dental implant in a 59 old healthy patient's mandible and a secure solution for this kind of complication. During the drilling, bone quality type IV was observed. In sequence, implant was abruptly inserted in the perforation site and dropped into the bone marrow. Panoramic radiograph showed the implant inside bone marrow, close to mandibular base. The implant was removed through the surgical site. The screw of the implant prosthesis transfer was used to reach the displaced implant. A second implant with the same dimensions as the first one, differing by the external hexagon, was inserted into the same implant site. Therefore, the authors strongly recommend the use of the presented technique prior to osteotomy on mandibular body, reserving the second in the impossibility of reaching the internal connection of the displaced implant.

Keywords: Dental implants; Bone density; Movement; Mandible.

Resumo

A região posterior da mandíbula é considerada um lugar altamente previsível para estabilidade primária durante a colocação do implante dentário. Porém, essa região pode apresentar uma diminuição significativa da densidade óssea, o que pode levar ao deslocamento do implante durante a inserção. O presente caso relata um deslocamento incomum de implante dentário na mandíbula de um paciente de 59 anos de idade, saudável, e uma solução segura para esse tipo de complicação. Durante a perfuração, foi observada qualidade óssea tipo IV. Na sequência, o implante foi inserido abruptamente no local da perfuração e inserido na medula óssea. A radiografia panorâmica mostrou o implante dentro da medula óssea, próximo à base da mandíbula. O implante foi removido pelo sítio cirúrgico. O parafuso de transferência da prótese do implante foi utilizado para alcançar o implante deslocado. Um segundo implante com as mesmas dimensões do primeiro, diferindo pelo hexágono externo, foi inserido no mesmo local do implante. Portanto, os autores recomendam fortemente a utilização da técnica apresentada previamente à osteotomia do corpo mandibular, reservando a segunda na impossibilidade de atingir a conexão interna do implante deslocado.

Palavras-chave: Implantes dentários; Densidade mineral óssea; Movimento; Mandíbula.

Resumen

La región posterior de la mandíbula se considera un lugar altamente predecible para la estabilidad primaria durante la colocación de implantes dentales. Aunque, esta región puede presentar una disminución significativa de la densidad ósea, lo que puede provocar la dislocación del implante durante la inserción. El presente caso reporta una dislocación inusual de un implante dental en la mandíbula de un paciente anciano sano de 59 años y una solución segura para este tipo de complicación. Durante el fresado se observó calidad ósea tipo IV. En secuencia, el implante se insertó abruptamente en el lugar de la perforación y se dejó caer en la médula ósea. La radiografía panorámica mostró el implante dentro de la médula ósea, cerca de la base mandibular. El implante se retiró a través del sitio quirúrgico. Se utilizó el tornillo de transferencia de la prótesis del implante para llegar al implante desplazado. Se insertó un segundo implante con las mismas dimensiones que el primero, que se diferenciaba por el hexágono externo, en el mismo sitio del implante. Portanto, los autores recomiendan encarecidamente el uso de la técnica presentada antes de la osteotomía en el cuerpo mandibular, reservándose la segunda en la imposibilidad de llegar a la conexión interna del implante desplazado.

Palabras clave: Implantes dentales; Densidad ósea; Movimiento; Mandíbula.

1. Introduction

Dental implant surgery has become a highly predictable procedure; however, risks are still associated with the surgical or restorative therapy phase. Intraoperative complications and accidents related to surgery have included hemorrhage, nerve damage, mandibular fractures, and damage to adjacent teeth, lack of primary stability, and displacement or migration of implants (Camargo & van Sickels, 2015; Chrcanovic & Custódio, 2009; Lamas Pelayo et al., 2008; Real-Osuna et al., 2012).

An unusual site for this kind of complication is the posterior body of the mandible. Very few cases have been previously published of displacement of dental implants into the medullary space of the mandible during implant surgery (Bayram & Alaaddinoglu, 2011; Doh et al., 2011; Kim et al., 2017; Oh et al., 2016; Pistilli et al., 2018). When it occurs, it can be associated with osteopenic bone with a low quality of bone marrow (Holahan et al., 2008; Lee et al., 2013).

Although mandible has the prerogative of being a secure location for installing dental implants, attention to bone quality during the implant planning must be seriously regarded. Radiolucencies areas should be considered as a possible

manifestation of focal osteoporotic bone marrow (Bravo-Calderón et al., 2012). If necessary, further computed tomography (CT) exams should be performed (Marar et al., 2020). Once this kind of manifestation is present, the primal stability is reached anchoring the implant exclusively on the cortical bone (Sugiura et al., 2019).

The present case reports an unusual dislocation of dental implant in a 59 old healthy patient's mandible and a secure solution for this kind of complication.

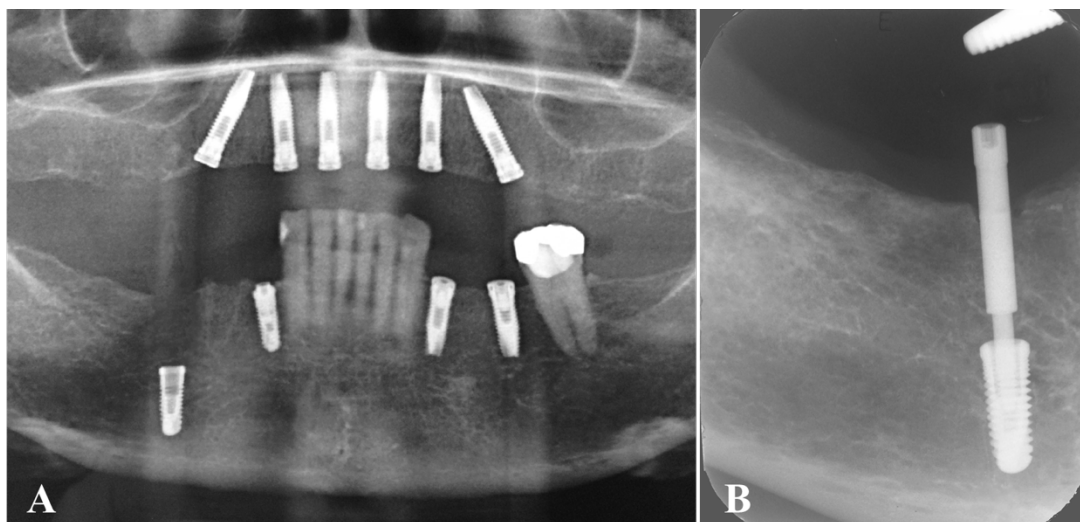
2. Methodology

This is a interventional, prospective and descriptive case report study that has the patient's authorization through the Informed Consent Term (ICT), elaborated in easy-to-understand language and following the precepts for publication, without patient identification and according to the principles of the Declaration of Helsinki (Pereira et al., 2018). In addition to the description of the case and the technique used for its resolution, a brief review of the literature was also carried out through the search for scientific research articles and case reports, from the last 15 years, through the portals “PubMed” and “Google Scholar”, through the descriptors “Dental implants”, “Bone Density”, “Movement” and “Mandible”.

3. Case Report

A 59-year-old woman presented to the Department of Diagnosis and Surgery of Univ. Estadual Paulista (UNESP/Aracatuba) for implant placement to prosthetic rehabilitation of maxilla and posterior mandible. The patient did not claimed any medical problems. The clinical examination revealed absence of posterior teeth in the mandible and complete edentulism of the maxilla. At the first appointment, 6 implants were placed in the upper jaw without any complications. At 2 months later, a second surgery was performed for implants placement in the lower edentulous segments. Local infiltrative anesthesia was performed. A crestal incision was made along the alveolar ridge, and a mucoperiosteal flap was elevated. Type IV bone quality was observed during the osteotomy, and the drilling sequence was ended at a 3mm-diameter drill. The implant selected for the region was a 4.1- mm diameter, 13-mm length (Implalife®, Jales, São Paulo, BR) with internal connection. During the insertion of the implant, the implant was abruptly inserted in the perforation site and dropped into the bone marrow (Figure 1).

Figure 1 – (A) Panoramic radiography showing the displaced implant inside bone marrow, close to mandibular base. (B) Periapical radiograph showing the attachment of the implant transfer's screw to the implant connection. After the installation of the screw, the implant was pulled out from the bone marrow.



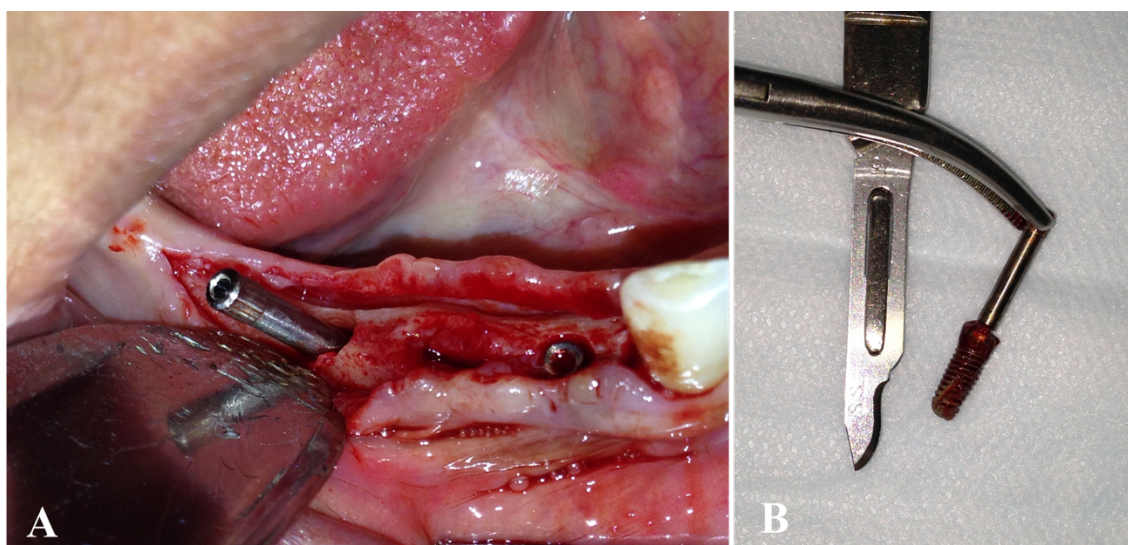
Source: Authors file (2021).

The figure 1- A demonstrates panoramic radiograph performed over the trans-surgical moment to detect the implant location and revealed the implant inside bone marrow, close to mandibular base, maintaining a vertical position.

It was proposed to the patient the removal of displaced implant through the surgical site, avoiding any bone defect on the region or parenthesis risk by a buccal osteotomy. The screw of the implant prosthesis transfer was used to reach the displaced implant.

In figure 1-B it is possible to observe the periapical radiography that was took to evaluate the position of the transfer screw in relation to the implant after the insertion.

Figure 2 - (A) Intraoperative demonstration of the placement of the transfer's screw implant during the technique for removing the displaced implant. (B) Implant connected to transfer screw after mandibular body removal.



Source: Authors file (2021).

As seen in Figure 2, guided by the radiography, the transfer screw was attached to the connection of the displaced implant, and then, it was pulled out from the bone marrow.

A second implant with the same dimensions as the first one, differing by the external hexagon, was placed into the same implant site. Postoperatively, a 7-day course of amoxicillin and chlorhexidine 0.12% rinse was prescribed. The sutures were removed at 7 days postoperatively, and the healing was uneventful. The patient didn't claimed any neurosensorial alteration or pain.

4. Discussion

Although dental implant surgery is considered a simple and predictable procedure with high rates of success, especially on mandible, (Geckili et al., 2012) unforeseen complications and rare accidents could occur especially in the posterior segments with lower trabecular bone density than in anterior segments (Lutz et al., 2018; Wanner et al., 2013). It could be hypothesized that the patient had osteopenic bone from osteoporosis, commonly presented in postmenopause women (Ji & Yu, 2015). Nonetheless, the patient didn't have a medical history of osteoporosis, confirmed by bone densitometry test.

Radiologic improvements over the years didn't enhanced bone density diagnoses on panoramic radiographic. The lack of a clear radiographic visualization on the most common image exam, makes difficult to perform a preoperative bone quality diagnoses (Geraets et al., 2007). CT is a more sensitive exam, that can provide an improved image for the assessment of bone marrow of the area. In osteoporotic patients and post-menopause women, a loss of bone mass might occur. A CT exam should be performed prior to implants placement, except on mandible anterior region (Brasileiro et al., 2017; Guerra et al., 2017).

On a poor-quality bone marrow mandible, the implant must be anchored on the superior layer of cortical bone. Internal connections implants are assumed to be anchored on medular bone, being positioned 2mm infraosseous. In the present case, primal stability could not be relied on the poor quality bone marrow (Farré-Pagés et al., 2011; Isoda et al., 2012). Considering the characteristics of the mandible, external hexagon should be selectioned for the case, assuring the implant locking. After the removal of the dislocated implant, another implant with a external hexagon connection was installed on the same moment, with no further complications.

Once displaced, the anatomical features of this region lead the implant to be positioned lingually to the alveolar nerve. For the implant retrieving, it's possible to perform a mesiodistally enlargement of the drilling hole to gain access for the implant removal (Doh et al., 2011). As second option, a osteotomy on mandibular body can be performed and the bone fragment removed to reach the dislocated implant, repositioned and fixed with titanium miniplates and screws (Bayram & Alaaddinoglu, 2011; Pistilli et al., 2018). Although this approach can be easily performed by a maxillofacial surgeon, it can be technically tricky to most of dental practioners, with the possibility of neurosensorial disorders with an inadequate surgical technique. Besides, the miniplates leads to a second intervention for its removal and a bone repair period prior to the reintervention on the area is necessary on both options. On the present case, the removal of the implant was performed with no additional bone removal, configuring to less morbidity for the patient and possibility to install immediately another implant on the cortical bone.

Implant placement is actually a high predictable surgical procedure. Intraoperative complications should be well understood by the practitioners. Unforseen events as the dislocation of implant on mandibular bone marrow should be prevent by a criterious radiograph analysis and careful surgical technique. Even if the dislocations occur, the removal of this implant can be performed without any damage to nerve and vessel bundles. The authors strongly recommend the use of the presented technique prior to osteotomy on mandibular body, reserving the second in the impossibility of reaching the internal connection.

5. Conclusion

Due to dental implants displacement into the mandible body, which can occur mainly in patients with low bone mineral density, implants removal technique using the screw of the implant prosthesis transfer is highly practiced indicated since its safety, practicality, and reduced need for second surgical interventions.

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