

Case Report

Complex odontoma and the use of platelet-rich fibrin for wound healing

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ABSTRACT

Complex odontomas are asymptomatic, benign odontogenic growths, more prevalent in the male and pediatric population. Although often found incidentally on radiography as a radio-dense mass, surgical removal is often necessary to prevent future complications. The use of autologous platelet-rich fibrin (PRF) has been shown to aid in wound healing and post-operative recovery. Here, we report the case of a 30-year-old male presented with a left mandibular mass on radiography. Intraoral examination revealed an asymptomatic swelling, identified as a complex odontoma by histopathology after removal. Complete excision was undertaken by piezosurgery, and the addition of PRF resulted in excellent recovery.

Key words: Multiple complex odontoma, Multiple odontomas, Hamartoma, Platelet-rich fibrin

Odontomas belong to the category of odontogenic tumors. They constitute 5% to 30% of all odontogenic tumors with a higher prevalence among children and males [1,2]. It usually manifests as a painless growth and is diagnosed as an incidental finding on X-ray imaging [2, 3]. The etiology remains yet undetermined, however, factors, such as trauma, genetics, and local trauma may play a role [3]. Odontomas are found frequently in association with unerupted teeth that have remained intraosseous [2,4,5]. They are classified as either compound or complex odontomas which can be differentiated using radiological examination [1-3]. On radiography, compound odontomas may appear as a collection of fused small teeth that may be misdiagnosed as a supernumerary tooth [6], whereas, complex odontomas show up as a radiodense mass on X-ray. Complex odontomas are often found in the region of the third mandibular molars [7].

The World Health Organization (WHO) considers these complex odontomas to be hamartomatous malformations. These tumors are characterized by malformations in which the teeth are aligned in a disorganized structure [8]. To reduce the risk of swelling and malalignment of teeth, as well as, future complications to denture fittings and for

histopathological purposes, odontomas are surgically removed. Postoperative healing may be improved by the use of autologous substances, such as platelet-rich fibrin (PRF). Several current studies demonstrate the benefits of the use of PRF in soft tissue interventions [6]. PRF consists of plasma proteins, thrombocytes, leukocytes, and their growth factors, embedded in a fibrin matrix [9]. It is of utmost relevance in wound healing and functions as a matrix by promoting cell migration and proliferation. The aim of this case report is to show the treatment of a large complex odontoma in a 30-year-old male using PRF to fill the cavity. To the best of our knowledge, this is the first case in the literature, which describes the use of PRF after the removal of a complex odontoma.

CASE REPORT

A 30-year-old male patient presented with partial missing dentition. The past medical history was non-significant except for a rare diagnosis of folliculotropic mycosis fungoides. However, there is no current known connection between odontomas and the folliculotropic mycosis fungoides. On general examination, the vitals were stable. The intraoral examination revealed an expansion that was firm to palpation with normal appearing overlying mucosa. In addition, there was minimal general gingivitis with no relation to the odontoma. Moreover, oral hygiene was good.

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Extraorally, there was a tender and palpable left submandibular lymph node. No further extraoral signs were seen. Panoramic radiography showed a relatively well-defined, mixed, radiolucent-radiopaque lesion on the left mandibular side containing multiple tooth-like structures. The lesion expanded in the anterior and posterior dimensions with intimate involvement of both the buccal and lingual walls. In the inferior dimension, the lesion was in direct contact with the inferior alveolar nerve canal. The cone-beam computed tomography (CBCT) specified an initial diagnosis of multiple complex odontomas (**Figure 1**).

The surgery was performed under local anesthesia. The access was created by performing an incision with a 15c scalpel in order to reflect a full-thickness mucoperiosteal flap. A piezoelectric handpiece was used to perform the osteotomy. The odontoma was segmentalized and removed in its entirety. Once removed, the lesion was submitted for histopathological analysis to confirm the diagnosis (**Figure 2**). The histopathological report confirmed our primary differential diagnosis of complex odontoma.

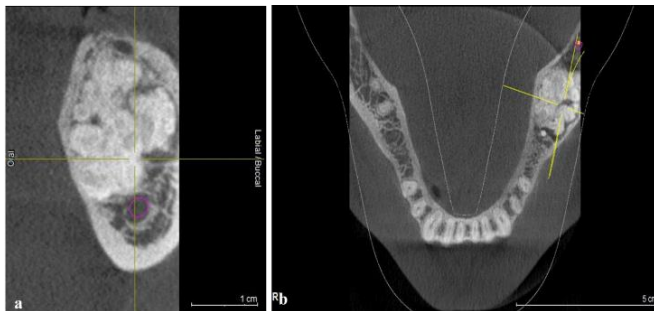


Figure 1: Cone-beam CT of the odontoma showing (a) the relation to the inferior alveolar nerve in a transversal plane; (b) the expansion of the odontoma in bucco-lingual and mesio-distal dimension



Figure 2: (a) Intraoral view of the odontoma; (b) Odontoma fragments after removal

Next, the PRF was prepared. Forty milliliters of venous blood was withdrawn into four separate tubes and centrifuged at 1300 rpm for 8 minutes to obtain the I-PRF and A-PRF. The PRF was then strategically placed into the entire bone defect (**Figure 3**).

The wound was closed with a 5-0 non-absorbable multifilament silk suture. Antibiotic postoperative coverage with amoxiclav 875 /125 mg was given to prevent further infections. Close follow-up was indicated at 12 weeks postoperatively (**Figure 4**). Up until this day, there was no recurrence or postoperative complications seen.

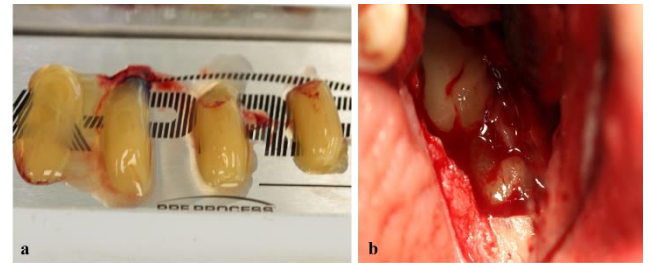


Figure 3: (a) The appearance of PRF-clots after centrifugation; (b) PRF placed into the wound after removing the odontoma



Figure 4: Postoperative panoramic X-Ray after 12 weeks

DISCUSSION

Odontomas are the most commonly diagnosed odontogenic tumors. They are often asymptomatic and diagnosed on routine radiological analysis. We distinguish between the complex and the compound type odontoma. While the compound type mostly occurs in the anterior region of the jaw, the complex odontoma occurs most frequently in the mandibular molar region above the crowns and roots of unerupted teeth [10-12]. In spite of the high prevalence of odontogenic tumors, multiple complex odontomas are rare and unknown in their prevalence [13].

The etiology of complex odontomas is unknown, but infection, trauma, and family history are considered as predisposing factors. Recently, a study suggested that mutations of the fibroblast growth factor genes (FGF3 and FGF4) may contribute to the development of an odontoma in the mandible. In our case, the family history was unknown [14]. Multiple complex odontomas present an operative challenge, particularly in regard to nerve injury prevention and the preservation of anatomic structures. In our patient,

we utilized a piezosurgery handpiece to create a conservative osteotomy in effort to prevent any damage to the patient's anatomy. In addition, PRF was used to aid in the expedition of wound healing [15,16].

Current literature demonstrates that PRF has an advantageous effect on soft tissue regeneration. It acts on the secretion of growth factors, including platelet-derived growth factor (PDGF) and vascular endothelial growth factor (VEGF). Within the last decade, PRF has shown how the autologous platelet concentrate has changed regenerative therapy in oral and maxillofacial surgery. Both A-PRF (advanced PRF) and I-PRF (injected PRF) have a very significant, slow sustained release of growth factors for at least one week, which stimulates the early phases of vascularization and angiogenesis [17].

CONCLUSION

This case report illustrates a rare case of histologically confirmed complex odontoma and its successful treatment with a piezoelectric hand piece and PRF. Currently, there is not much evidence available on the etiology and risk factors associated with the development of odontomas. Epidemiological prospective cohort studies are needed to determine predisposing factors that put patients at higher risk of developing odontomas. Further, the utility of piezoelectric surgery in its less invasive nature during surgery and the associated benefits in post-operative recovery need to find more recognition in oral and maxillofacial surgery.

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