

ENDODONTIC PASTE PENETRATION BOTH IN MAXILLARY SINUS AND MANDIBULAR CANAL: REPORT OF A CASE TREATED BY PIEZOSURGERY

MANDİBULAR KANAL VE MAKSİLLER SİNÜS İÇERİSİNDE ENDODONTİK DOLGU MATERYALİ VARLIĞI: PİEZOCERRAHİ İLE TEDAVİ EDİLEN BİR OLGU SUNUMU

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ABSTRACT

Endodontic incorrect preparation and overfilling can cause root canal filling material pushing into the adjacent vital anatomical structures such as maxillary sinus and mandibular canal. This condition can cause undesirable sensitivity symptoms. Although in some cases spontaneous resorption of some materials has been described; surgically removing the material presents the most favorable prognosis. In this study; a case of endodontic paste penetration both in maxillary sinus and mandibular canal which was treated by piezosurgery is presented.

Keywords: Inferior alveolar nerve injuries; Foreign body; Extrusion of endodontic paste materials

ÖZET

Kök kanal tedavisinde hatalı preperasyon ve kök kanalının fazla doldurulması, kök kanal dolgu materyalinin maksiller sinüs ve mandibular kanal gibi komşu anatomik yapılara itilmesine sebep olabilir. Bu durum istenmeyen duyarlılık belirtilerinin meydana gelmesine yol açabilmektedir. Bazı vakalarda dolgu materyalinin spontan olarak rezorbe olduğu bildirilmiş olsa da materyalin cerrahi olarak çıkarılması en olumlu prognozu sunmaktadır. Bu çalışmada; aynı vakada mandibular kanal ve maksiler sinüs içerisinde bulunan kanal patının piezocerrahi ile tedavisi sunulmuştur.

Anahtar Kelimeler: inferior alveoler sinir zedelenmesi; yabancı cisim; kök kanal dolgu materyalinin taşırılması

INTRODUCTION

Inferior alveolar neuralgia is generally seen as a complication of third molar surgery and inaccurate placement of dental implants.¹ Irreversible injury of the inferior alveolar nerve (IAN) following endodontic treatment of the mandibular teeth is a rare complication but it causes some sensory disturbances like pain, hyperesthesia, hypoesthesia, anesthesia and paresthesia.^{2, 3} These complications generally occur following the extrusion of a canal sealer into the mandibular canal. If the root canal filling materials are too close or intimate contact with the nerve structures, the toxic effects of the materials consists irreversibly.⁴

Sensory disturbances of the IAN generally give symptoms in the soft tissue of the lower lip and chin.^{3, 5} It is reported that surgical removal of root sealer from the mandibular canal is an effective treatment and often complete resolution of anesthesia and paresthesia.^{6, 7}

Maxillary molar and premolar teeth are generally close to maxillary sinus wall. In some individuals, the bone of maxillary sinus floor can be very thin or the antral mucosa may lie alone between the apices of the teeth and maxillary sinus. Because of this close proximity and anatomy, during root canal treatment over instrumentation and filling causes the root canal filling materials pushing into the maxillary sinus.⁸⁻¹⁰ Some of the cases can be asymptomatic, however some can cause chronic sinusitis.¹⁰ Additionally, overextension of root canal filling materials might be an etiological factor for aspergillosis of the maxillary sinus and it has been reported as a complication of endodontic treatment in the literature.^{10, 11}

The aim of this paper was to present a case of endodontic paste penetration both in maxillary sinus and mandibular canal in the same patient and treatment options.

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CASE REPORT

A 35 year old female patient was referred to the Oral and Maxillofacial Surgery Department of Ege University because of prolonged anesthesia in her left mandibular region and orbital pain in her left maxillary molar region, which developed following an endodontic therapy. The patient was healthy with no medical disorders. She reported that her dentist had performed root canal treatment in her left maxillary first molar and left mandibular second premolar a month ago and after endodontic therapy she had returned to her dentist for numbness in her left lower lip and chin and pain in her left maxillary region. The dentist had decided to remove both of the teeth but no healing occurred following the extraction (Fig. 1).



Fig. 1. Preoperative radiograph of the patient

In intraoral examination no swelling, erythema or any sign of infection were detected. At radiographic examination the presence of well defined radioopaque material revealed in the inferior alveolar canal region and in the periapical area maxillary first molar tooth. The patient was informed about the treatment options and potential complications of surgical treatment.

After the patient signed an informed consent form, primarily it was decided to remove the material in inferior alveolar canal. Additionally, one month later, the surgery of maxillary sinus was performed. The patient was taken under local anesthesia. After intraoral incision, bone was excised by using piezosurgery device to prevent damage to mental nerve. Bone flap was removed and root canal filling material with the inflammatory tissue around it extricated carefully (Fig. 2). Bone flap inserted in its place with one screw (Fig. 3). The wound was closed primarily. Antibiotics (amoxicillin tablet, 1000 mg, every 12 hours) and anti-inflammatory (ketoprofen tablet, 100mg) medication was given to the patient for

the next 7 days. Three months later after the surgery the patient reported that paresthesia had disappeared.



Fig.2. Root canal filling material and inflammatory tissue in the inferior alveolar canal region



Fig. 3. Bone flap inserted in its place with one screw

A month later the patient was taken under local anesthesia again for maxillary sinus surgery. After intraoral incision, bone was excised by piezosurgery device till the root canal filling material exposed and it was extricated carefully (Fig. 4). The sinus was irrigated with saline solution. Bone flap inserted in its place with 3 screw and 0, 5 cc bone graft material used. A resorbable membrane was covered over the bone flap (Fig. 5). The wound was closed primarily. Antibiotics (amoxicillin tablet, 1000 mg, every 12 hours) and anti-inflammatory (ketoprofen tablet, 100mg) medication was given to the patient for the next 7 days. Three months later, control radiography showed no pathologic changes to the mandibular canal and maxillary sinus and the endodontic filling material was completely cleared (Fig. 6).

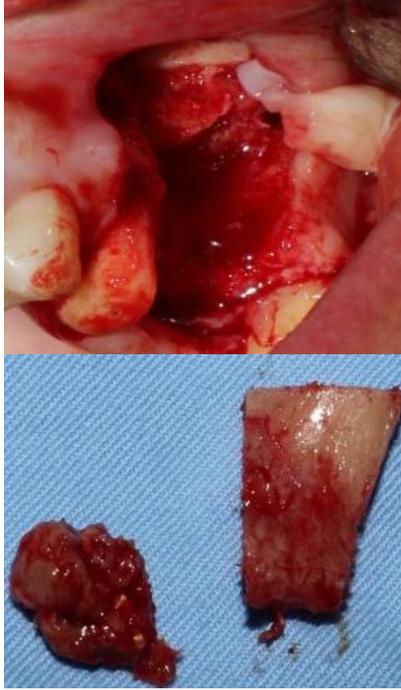


Fig. 4. Root canal filling material in maxillary sinus exposed and it was extricated carefully



Fig. 5. After bone flap inserted in its place with 3 screw, bone graft material covered over the bone flap.



Fig. 6. Postoperative radiograph of the patient

Six months after maxillary sinus surgery and five months after inferior alveolar nerve surgery the clinical examination showed that paresthesia in left lower lip and pain in the maxillary left region had completely resolved. Thereafter all screws removed under local anesthesia.

DISCUSSION

Accidental overfilling of root canals may sometimes cause damage to surrounding vital anatomic structures such as maxillary sinus and inferior alveolar nerve.^{3, 4, 6-8} Overextension of root canal materials into the mandibular canal may cause irreversible nerve damage that causes sensory loss or alteration in the area of the innervation of the IAN and overextension of the material into the maxillary sinus can cause maxillary sinusitis including aspergillosis infection and foreign body reactions.^{1, 8, 11-13}

These two mechanisms may lead to injury; chemical neurotoxicity and mechanical compression.^{3, 7, 14, 15} Compressive forces can cause irreversible changes and further fibroblast invasion, scarring, and fiber degeneration.⁷ For this reason, immediate decompression of the IAN is important to prevent this irreversible changes. Components of these materials cause reactions of inflammation in periapical tissues; and in maxillary sinus these materials cause blocking of ciliary movement because of inflammation.^{3, 8}

Many of previous clinical reports shows that surgical removal of the root canal filling material from the mandibular canal and maxillary sinus is an effective treatment and complete resolution of the problem.^{6, 7, 13} On the other hand in some clinical case reports if the patient had no complaints, no surgical treatment was performed and the patients was followed up with periodic radiographic examination.^{3, 8}

In their case reports Koseoglu et al⁶ and Garde et al¹ preferred decompressing the nerve by removing the canal sealer surgically but Poveda et al⁴ and Martin et al¹³ preferred periodic follow-up visits to surgical removal. In most cases, treatment options are decided according to the patient's complaints and preferences. Some patients do not accept surgical treatment so these patients should be followed up clinically and radiologically.^{4, 13}

A surgical approach with removal of the foreign body in maxillary sinus was performed in many cases. Tanasiewicz et al removed root canal filling material from the maxillary sinus due to the patient's complaints.¹⁰ However Batur et al preferred radiographic and clinic follow up in their case and after 5 years period, radiographic examination showed no pathological changes in periapical or antral tissues. As a result they thought that excess filling material might have been resorbed by the pressure in antrum and lost via the nose.⁸

While discussing the treatment options, several factors like the location of root canal filling material, the length of time after endodontic treatment and chemical properties of the material and also the patient's complaints might be considered.^{1, 6, 16} In the present case after discussing the treatment options, decompressing the nerve by removing root canal filling material surgically and surgical removal of root canal filling material from maxillary sinus was decided. Surgical procedure was performed by piezoelectric surgery devices to prevent damage to mental nerve and maxillary sinus mucosa during the surgery. After removal of bone flap, mental nerve was retracted to clean all the material from mandibular canal. Then, bone flap inserted in its place with one screw.

In maxilla, identical surgical procedure was performed, but bone flap inserted in its place with 3 screws. A month later after the surgery of mandible, the patient reported an improvement in sensation and 4 months later after the control she reported that paresthesia disappeared. One month later after maxillary sinus surgery she became symptom free.

CONCLUSION

Clinical success of the case presented here demonstrates the good results obtained with piezoelectric surgery for removal of root canal filling material without damage to any anatomical structures. However, to avoid this complication, dental practitioners should take some precautions such as careful instrumentation of root canals and use of necessary amount of root canal paste. When this complication occurs, the appropriate treatment method should be selected based on the patient's medical history and his/her complaints.

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