CASE REPORT

An Endodontic Overfilling Occupied the Foramen Mentale -A Case Report

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ABSTRACT

latrogenic complications of endodontic therapy, might be an etiological factor and mediator of important pathological changes such as infections and sensory disturbances. This case presents a 52 year-old female patient, who referred with complaints of one year persisting pain and numbness of right lower lip and chin. The radiographic examinations revealed a large amount of diffuse radiopaque material suspected to be an extruded endodontic filling, extending from the lower right canine to the first molar tooth. Under local anesthesia following a routine surgical protocol, a bone corticotomy with curettage of extruded material were performed. During one month of healing period, the patient felt an anesthesia. However, two months later the recovery of sensation was reported.

Key words: overfilling, paresthesia, anesthesia, formen mentale.

Introduction

Endodontic treatment is one of the most performed dental procedures, characterized by root intracanal preparation, followed by elimination of the infected pulp and dentin tissues. Mainly the success of the treatment depens on sterilization and hermetically obturation of the root canals by different filling materials at the end of the procedure, without extension to periapical tissues (1-4). There is an opinion that ideal filling length of preparation is 0 to 1 mm short of the apex (2,3).

However, despite advances in root canal preparations, iatrogenic complications of endodontic treatment are not irrelevant. One of the most seen is overfilling, which is mostly the result of over instrumentation of the root canals (2). Filling materials due a site of extrusion, might act as a foreign body causing chemical or mechanical irritations of periapical tissues, ranging from mild inflammatory and allergic reactions to neurotoxic damages (1-8). This might be very difficult if the materials are in connection with anatomically important structures such the nerves, blood vessels or sinus space are (1,2,4-10).

The purpose of this report is to present a case of 52 year-old female patient who underwent an endodontic treatment of the right lower first premolar, with complication of overfilling in the region of foramen mentale.

Case Report

A 52 year-old female patient referred to the Department of oral and maxillofacial surgery, Faculty of dentistry, University of Istanbul, with symptoms of pain and numbness of lower lip and chin from the right side of the face. From the patient's health history, it was found out that these symptoms developed a day after the patient underwent an endodontic treatment of the lower right first premolar, approximately a year radiographs are available from that treatment). The patient was treated with antibiotics without any improvement, after which, the extraction endodonticaly treated tooth was made. However, after the extraction, the presence of sensation disturbances did not stop. The medical history also excluded the systemic diseases such as multiple sclerosis, sarcoidosis, viral and bacterial infections, metastatic malignancies etc., which might be in association with nerve sensation disturbances in previously mentioned parts of the face. Clinical intraoral and extraoral examinations disclosed partially toothless from the right side of the mandible with no presence of swelling and asymmetry. Absence of sensation to light touch, in the form of anesthesia, was noted in the region of the right mental nerve inervation including lip, chin and oral mucosa. However, a stronger touch caused a pain sensation in the region of mental foramen.

The panoramic radiograph showed the presence of a large amount of radiopaque material suspicious to be an extruded endodontic fillings, in the bone region of missing lower right premolar teeth around mental foramen. Also, from the left side below the teeth bridge crown of lower second molar, a small piece of probable dental amalgam filling was present into the bone, without production of any discomforts for the patient (Fig.1).

Seven days, before surgical procedure of nerve

decompression was done, the patient was under antibiotics and dexamethasone therapy. "Neurobion", a combination of B complex vitamins was prescribed too.

Under local anesthesia sulcular incision from the inferior right canine to the first molar tooth was made and the mucoperiostal flap was raised, after which mental foramen was exposed.

Osteotomy of the cortical bone was performed (Fig. 2). The region of the bone with overfilled material was carefully curetted, due the close relation with the mental nerve and foramen, and after that irrigated with saline solution. The flap was repositioned to its original position and sutured. Postoperative panoramic radiograph showed cleared area of previously placed filling material (Fig. 3). During one month of healing period, the patient felt an anesthesia. However, two months later the recovery of sensation was reported. The patient is under follow up for a 8 months without any complaints or complications.

Discussion

Overfilling of the rooth canals, near anatomical structures such the nerves are, may cause a different kinds of sensitive disturbances, which vary from anesthesia, paresthesia, dysestesia and hypoesthesia (1,2,4,6-8). Endodontic paresthesia is defined as a burning or tickling, tingling, pricking sensation or partial numbness, and mostly is in correlation with the inferior alveolar nerve or mental nerve injuries (1,7). There are two main mechanisms of the nerve injuries by overfilled endodontic filling materials; mechanical pressure and chemical irritation (2-7). The studies have shown that approximately all of the used endodontic materials including zinc oxide, calcium hydroxide, eugenol etc. are in different spectrum neurotoxic through inhibition of nervous conduction (1,2,7,9). However, it was also reported that eugenol and paraformaldehyde are the main materials responsible for neurotoxic reaction, causing a permanent damage of Eugenol is able to cause axon the nerves (1,2,9). destruction and protein coagulation by inhibition of cellular respiration and membrane lysis, which leads to cell necrosis (6). Serper et al. (9) in experimental study have shown that paraformaldehyde containing endodontic sealers cause a faster inhibition of the compound action potentials (CAPs), than it was a case with other materials, leading to irreversible blockade of nerve conduction. The same study have show that depending of duration, calcium-hydroxide also inhibit CAPs, with reversible or irreversible blockade of nerve conduction (9).

Due to close relation of lower molars and premolars to the mandibular canal and mental foramen, the inferior alveolar nerve and mental nerve are the most frequently liable to overfilling induced paresthesia. In our presented case, it was notified an iatrogenic overfilling by endomethasone near the foramen

mentale, which caused an one year prolonged paresthesia of right lower lip and chin. In the study of Knowles et al. (8), it was reported that incidence of iatrogenic induced mental nerve paresthesia is 0,24% comparing with about 0,96 % of all mental paresthesias. Similar to us, Brkić et al.(2) also reported a case of four months prolonged anesthesia of the mental nerve caused by overextension of endodontic sealer near mental foramina. Although it was thought that guttapercha and calcium hydroxide are the most biocompatible endodontic materials, Ahlgren et al. (5) have described a case of paraesthesia caused by displacement of calcium hydroxide paste during endodontic treatment of lower second premolar. The toxic effects of calcium hydroxide are explained with reduction of nerve activity through destabilization of the nerve membrane potential by excess of calcium and hydroxide iones, which leads to irreversible damages to nerves (9). This might be also associated with high pH value that calcium hydroxide own (2).

However, the occurrence of sensory disturbances is not only associated with nerve injuries. Yaltırık et al. (10) described a case of orbital pain and headache, resulting from overextension of endodontic sealer into the maxillary sinus space, although the occurrence of sealers, especially those containing zinc oxide is more associated with aspergillosis appearance. (Because of the fact, that zinc oxide is considered to be a growth factor for fungi of the genus Aspergillus).

There is an opinion that acute nerve injuries have a better prognosis than chronic nerve injuries, due to fact, that the nerve damage increases with the duration of the injury, because of nerve ishemia and epineural edema (4). Anyway, the practice, as it was evidenced in our case and in cases reported by the other authors before, have showed that chronic paresthesia has a good prognosis for recovery, following surgical removal of the extruded material (1-4). Although spontaneous healings of endodontic mishap are possible, surgical and medical therapy is more indicated in cases of nerve compression and persistent anesthesia and paresthesia. Therapeutical options also include a use corticosteroids, especially prednisone, for reduction of compression effects, resulting from epineural and intraneural edema as well as a prevention of epineural fibrosis developing by proliferation of soft tissues around the affected nerve (2) . A combination of B complex vitamines play a role in regeneration of peripheral nerves, by normalizing metabolism, which was proved in animal models (11). Extraction or apicotomy of the overfilled teeth by claning around bone and decortication of the mandible achieved laterally through intraoral approach are surgical procedures also performed in cases of overfillings (1-7).

In our presented case, the patient was under antibiotic and corticosteroid therapy seven days before the surgical decortication with bone curretage were performed. Two months after the nerve decompression was done, the patient reported a recovery of sensation.

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Figure 1. Preoperative panoramic radiograph showing extruded endodontic filling in the region around mental foramen.



Figure 2. Intraoperative view showing an endodontic filling material into the bone.



Figure 3. Post-Operative panoramic radiograph showing clear area around mental foramen.

This might be also associated with use of "Neurobion" therapy during these two months, in which regeneration of nerve fibers and myelic sheaths could be achieved.

Conclusion

Although ocurrence of endodontic iatrogenic errors such as overfilling, are not rare, surgical approach might be helpful in reparation and prevention of serious complications that might be a consequence of the endodontic treatment failure. Good case-history, panoramic and periapical radiographs are the main factors for planning the surgical therapy.

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