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Cemental Tear Associated With Upper Left Canine – Case Report

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Abstract: This study aims to report an unusual clinical case of cemental tear in the upper left canine, presenting the clinical and radiographic characteristics of the lesion, predisposing factors, differential diagnosis, treatment and 12-month postoperative control. A 73-year-old male patient was referred for an apicectomy of the left maxillary lateral incisor. After the procedure the patient still had a capsulated intraosseous lesion at the apex communicating with the left maxillary canine. It was decided to place an immediate implant in that same region, which was later lost, and even so, the fistulated lesion continued to recur. After several attempts of curettage and total removal of the lesion the patient still presented it frequently. Through a Cone Beam Tomography, the diagnosis of cemental tear in the upper left canine was defined and its extraction was then performed. After the extraction, maintenance consultations were carried out in the subsequent periods of 3 months, 6 months and 12 months, where good bone healing was found and there was no more sign of infection. After 12 months of clinical follow-up, the surgical treatment proved to be quite efficient and, even without the placement of any type of biomaterial, bone neoformation could be observed in the region and there was no recurrence of the lesion.

Keywords: Cemental Tear, Dental Cementum, Periodontal Pocket, Radicular Cyst, Root Surface Fracture

1. Introduction

Cemental tear is a rare periapical condition characterized by total or partial separation of the cementum [1, 2]. This phenomenon of the calcified tissues of the teeth is described as a periodontal collapse associated with the separation of the cementum from the underlying tooth structure [3, 4].

It is considered a special type of root surface fracture [5, 6] and because it is located in a region where glycoproteins are present, and where the union between cementum and dentin occurs, it involves both cementum and, sometimes, root dentin [7, 8] and can lead to rapid and localized attachment loss [9, 10].

The etiology is still unknown, but some possible predisposing factors for cemental delamination have been reported, including: age (>60 years), sex (male), occlusal trauma, anterior teeth and vital teeth (not endodontically treated) [1, 2].

Clinically, teeth with cemental tear are prone to abscess formation [3, 11] and periodontal collapse [2, 3] and radiographically they are detectable through a root fracture involving cementum and sometimes dentin [4].

The differential diagnosis with periodontal disease, vertical root fracture and endodontic-periodontal lesion is of fundamental importance [11, 7]. In extracted teeth, the diagnosis of cemental tear is often made by direct observation of the fractured area of the cementum [8, 12], rather than by histological evaluation [4].

The prevalence of this lesion is still unknown, possibly due to the difficult diagnosis of the cemental delamination, leading to a limited number of cases reported in the literature [7, 13].

The purpose of this work is to present a case report of a patient from the Clínica Bertotto Odontologia, with the diagnosis of cemental tear involving the upper left canine, its respective treatment and postoperative control.

2. Methods

A 73-year-old male patient, resident of Caxias do Sul (RS, Brazil), attended the Clínica Bertotto Odontologia in August 2019, referred by the endodontist specialist to perform the apicectomy procedure of the upper left lateral incisor. All procedures followed were in accordance with the regulations of the relevant clinical and ethical investigation committee and in accordance with the World Medical Association Code of Ethics (Declaration of Helsinki), in addition, all protocols regarding the confidentiality of patient data, and its publication, were followed. We have received written consent from the patient mentioned in the article and the corresponding author is in possession of this document.

In the anamnesis, the patient reported chronic liver disease and on clinical examination, his main complaint was swollen gums and the presence of an active fistula between the apexes of the maxillary left central incisor and maxillary left lateral incisor.

2.1. Fistula Tracking

A Gutta-percha cone was used to track the fistula through periapical radiography and the radiographic image showed a radiolucent area at the apex of the upper left lateral incisor, extending the cone to the middle third of the upper left canine root (Figure 1).

Figure 1. *Periapical radiograph for tracking an active fistula with Gutta-percha showing a radiolucent area at the apex of the left maxillary lateral incisor, extending the cone to the middle third of the upper left canine root.*

A preoperative medical evaluation was then requested, in which the procedure was released and recommended the use of prophylactic antibiotics and, for analgesia, non-steroidal anti-inflammatory drugs.

2.2. Surgical Procedures

The apicectomy procedure was performed and the lesion was sent for histopathological analysis getting the result of a periodontal radicular cyst.

After the surgery, the symptoms continued to be present with an active fistula, presence of pus and no sign of healing. It was then decided to extract the upper left lateral incisor and rehabilitate with a 3.3x10mm Bone Level implant (Straumann®; Basel, Switzerland), Cerabone bone graft (Straumann®; Basel, Switzerland) and Porcine Jason regenerative membrane (Straumann®; Basel, Switzerland).

In the third postoperative month, the patient again presented infection with a fistula in the same region, symptoms and fibrointegration of the implant. A new surgery was performed by curetting the entire affected area and the implant was also removed. Histopathological analysis was performed again, this time with a result of a radicular periapical cyst.

2.3. Final Diagnosis

Two months after the operation, between the maintenance consultations, there was a recurrence of an active fistula with the presence of pus in the same region (Figure 2).

Figure 2. *Active fistula with presence of pus between the apexes of the left maxillary central incisor and left maxillary lateral incisor clinically observed.*

The fistula tracking technique was redone and it could be observed that the Gutta-percha cone led to the middle third of the upper left canine root, challenging our diagnosis (Figure 3).

A Cone Beam Tomography was performed for a better diagnosis and through it it was possible to observe a hyperdense image on the mesial of the middle third of the upper left canine root, compatible with a delamination of the cementum, concluding the diagnosis of cemental tear (Figure 4).

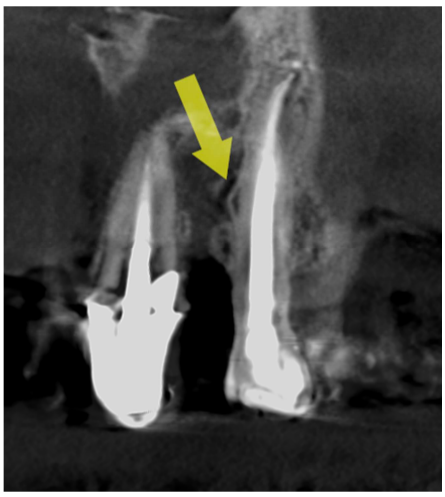

Figure 3. *Periapical radiograph for tracking an active fistula with Gutta-percha leading to the middle third of the upper left canine root, aiding in the possibility that the pathology is related to it.*

Figure 4. *Cone Beam Tomography with hyperdense image in the mesial of the middle third of the root of the upper left canine compatible with cemental delamination.*

2.4. Treatment

The conduct for the case was the extraction of the upper left canine. The technique performed was followed by left side infraorbital regional anesthesia with Articaine Hydrochloride + Epinephrine 72mg + 18µg (DFL®; Rio de Janeiro, Brazil) and Lidocaine Hydrochloride + Epinephrine 36mg + 18µg (DFL®; Rio de Janeiro, Brazil), Neumann incision with scalpel and 15C blade (Swann-Morton®; Sheffield, United Kingdom), with relaxant in the region of the upper left first premolar and tissue detachment, curettage of the entire lesion and simple suture with Mononylon 4-0 thread (Ethicon®; New Jersey, United States).

All procedures performed were prescribed prophylactic doses of two pills of Ciprofloxacin Hydrochloride (Medley®; São Paulo, Brazil) 500mg and postoperative antibiotic therapy with Ciprofloxacin Hydrochloride (Medley®; São Paulo, Brazil) 500mg every 12 hours for 7 days, Diclofenac Sodium 50mg (Neo Q; uímica®; Rio de Janeiro, Brazil) every 8 hours as a non-steroidal anti-inflammatory and analgesic Dipyrone Monohydrate 500mg/mL (Mantecorp Farmasa®; São Paulo, Brazil) 40 drops every 6 hours, according to the medical report, along with mouthwash with 15ml of Chlorhexidine Gluconate 0,12% for 1 minute (Colgate®; New York, United States) every 12 hours for a period of 7 days.

2.5. Clinical Follow-up

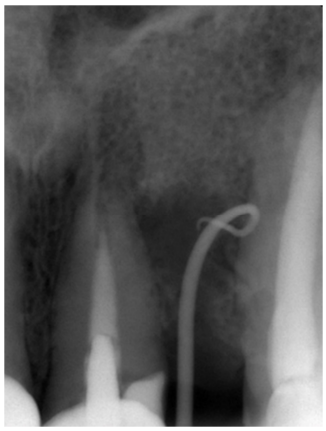

Figure 5. *Patient one year after the surgery and clinical success can be observed.*

After one year of treatment, the patient is doing well, with no sign of infection and ready for rehabilitation with dental implants. Orthodontic treatment of slow extrusion of the upper left central incisor was chosen, with the purpose of bone and gingival gain due to the vertical defect in the distal of the incisor, compromising the esthetics of the definitive treatment (Figures 5 and 6).

Figure 6. *Slow extrusion procedure of the maxillary left central incisor with orthodontics.*

3. Results

After the surgery to remove the upper left canine with the diagnosis of cemental tear, six months postoperatively, the patient presented excellent healing. For the continuation of the treatment, it was opted to fix an orthodontic appliance for slow extrusion of the upper left central incisor and rehabilitate with dental implants.

4. Discussion

The cementum tearing is a rare and specific condition of root surface fracture, characterized by the detachment of a fragment of cementum from the root surface [7, 9]. It occurs more frequently in males, usually over 60 years of age, in anterior, vital teeth, or those that have suffered some type of occlusal trauma [2, 7]. However, they can also occur in teeth that have undergone endodontic treatment or have a history of periodontal disease [1, 9]. In the present case, the cemental tear occurred in a 73-year-old male patient, in the upper left canine, with no history of occlusal trauma, but with previous periodontal and endodontic treatment, which is consistent with the literature.

Teeth that have this pathology can be clinically diagnosed by the formation of an abscess and periodontal collapse [3, 14], the patient reported frequent gum swelling and presence of an active fistula in the apical region between the upper left central incisor and the upper left lateral incisor. However, radiographically, the delamination of the cementum is hardly detected in the initial stages, only when the cementum detaches from the root surface is it possible to identify it through sequential angular radiographs [3]. In the case in question, it was not possible to detect it on the initial radiograph.

After tracking the fistula with Gutta-percha and preoperative medical advice, the apicectomy procedure was

performed, together with the referral of the lesion for histopathological analysis. The result was not compatible with cemental tear, but with a periodontal radicular cyst. At that moment, it could have been thought that the problem could be of periodontal origin and we could have exhausted all possibilities of treatment of conditions originating from the periodontium before proceeding with the case, but we ended up performing a treatment that did not comply with the pathology, generating the recurrence of a fistula.

It was only after the extraction of the upper left lateral incisor and rehabilitation with an implant that the diagnosis was concluded, as the patient returned with an active fistula present and fibrointegration of the implant three months postoperatively. We opted for a second fistula tracking with Gutta-percha, due to the recurrence of the infection, together with a Cone Beam Tomography, where the cementum fracture could be observed in the middle third of the root, in the mesial region of the upper left canine. Cases of cemental tear are often neglected, misdiagnosed and underreported because they are rarely described in the literature [7]. For this reason, the prevalence of this pathology is still unknown [13]. If an early diagnosis had been made and if there were more subsidies on the pathology in the literature, it would not be necessary to submit the patient to such invasive procedures and successive errors. A diagnostic method that could have facilitated but was not used in this case would be the microscopy of the tooth in question, which could lead to the possibility of a more conservative treatment, perhaps without the need for extraction of the upper left canine later. In view of this, case reports of cemental tear are of great value, as they describe a rare clinical situation, which can help Dental Surgeons in the diagnostic methods and possible means of treatment of these cases.

The objective of the treatment of the cemental delamination is to remove the origin of the pathology and return structure and function to the injured tissues [7], in addition, the total removal of the fractured cementum fragment is of the most importance for obtaining clinical success [7, 15]. The treatment possibilities for this condition may involve scaling and root planing, periodontal surgery, endodontic treatment and/or apical surgery, surgical debridement combined with guided tissue regeneration, bone grafting and, in cases of poor prognosis, extraction [9]. After several attempts of curettage and total removal of the lesion, the patient still frequently presented a fistulated lesion, making us opt for a more radical treatment, in this case, the extraction of the upper left canine.

All drugs used in the surgical procedures were prescribed with medical advice. In addition to the patient being elderly, he had comorbidity, reporting that he had chronic liver disease, and the drug choice (Ciprofloxacin Hydrochloride, Diclofenac Sodium and Dipyrone Monohydrate) was specific so as not to cause damage or overload his liver, having as a priority its proper functioning. For this, we use oral medications that are absorbed by the stomach and only metabolized by the liver and later excreted in greater amounts through the urine.

Some authors, such as Damasceno et al. [8] point to non-surgical periodontal therapy as the best treatment option, while Harrel and Wright [4] state that minimally invasive surgery for the removal of cementum fragments is also effective. Furthermore, Kaur et al. [13] refers to the use of MTA, together with Glass Ionomer Cement in the surgical procedure to seal the remaining tooth and restore the shape, in cases where only the fragment is removed. In cases where tooth extraction is the treatment of choice, there are studies such as the one by Pilloni et al. [2], who point to the use of biomaterials as a better regenerative approach. In the case in question, we opted for the extraction of the upper left canine and not using biomaterials, because they have already been used in the surgical procedures performed previously on the patient and had been lost, without success. After 12 months of clinical follow-up of the case, the surgical treatment of upper left canine extraction proved to be quite efficient. We opted for the orthodontic treatment of slow extrusion of the upper left central incisor with the intention of gaining bone and gum tissue, together with rehabilitation with dental implants, which is considered a safe, predictable and widely disseminated technique, which will restore aesthetics and function to the patient. At this moment, bone neoformation can already be observed in the treated region and there is no recurrence of the lesion, thus being a case of clinical success, with the patient being ready for rehabilitation.

5. Conclusion

Cemental tear is an uncommon type of root fracture, usually associated with attachment loss. Being localized and related to the tooth that has the pathology, we must be careful during clinical practice when observing isolated and deep periodontal pockets, considering all the diagnostic possibilities, both from endodontic/periodontal lesions, as well as from vertical root fracture, or even from lesions originating from the cementum, due to the fact that there are still no consistent data about the prevalence of this lesion. As their clinical and radiographic appearance is similar to periodontal and endodontic diseases, the diagnostic methods must be performed in detail and carefully analyzed. Exploratory surgery can also help, but the definitive diagnosis of cemental tear can only be made through histopathological analysis. The main objective of the treatment is to remove the source of the pathology and restore function and structure to the affected tissue, therefore, an early diagnosis and appropriate treatment avoid radical procedures such as unnecessary tooth extractions and results in a good prognosis.

Conflict of Interest

All the authors do not have any possible conflicts of interest.

Ethical Approval

The study was approved by the relevant clinical and ethical investigation committee.

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