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Surgical treatment in a dental element affected by overfilling: case report

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***Keywords*— endodontic treatment; endodontic surgery; apicectomy.**

***Abstract*—** *Parendodontic surgery is indicated for teeth with a persistent periradicular pathological process, which did not respond to the conventional approach. This intervention is also requested for cases of accidents in endodontic treatment. Among these, overfilling and extravasation of cone and obturator cement can lead to the appearance of a chronic inflammatory process in the periradicular tissues. The difficulty of removing this material makes endodontic surgery necessary. This study describes a surgical intervention in element 44, in view of the chronic inflammatory process resulting from cement leakage and obturator cone until the end of the treatment.*

I. INTRODUCTION

Parendodontic surgery constitutes a set of procedures with the objective of resolving complications resulting from a root canal treatment or its failure (LEAL, BAMPA, POLISELI, 2005). Its indication is necessary when it is not possible to access the canal system in teeth with periapical lesions, because of calcified canals or obstructed by fractured instruments, in addition to cases in which there is extravasated obturator material, failure of conventional treatment and impossibility of retreatment. , apical perforations, teeth with core or fixed prosthesis carriers (ARAÚJO et al., 2004).

The indication for performing wall-endodontic surgery is due to the failure of conventional endodontic treatment and retreatment, as the pathology continues to evolve. If there is a need to perform retrocavitation with its subsequent filling by an obturator material after the surgical technique, apical root resection. It is prerequisite that the material that will fill the retrocavity must be biocompatible, impermeable and have antimicrobial activity (VERRI et.al., 1991).

MTA (Mineral Trioxide Aggegate) was evaluated in vitro for its apical sealing power. Comparing MTA, amalgam and Super-EBA, the authors observed a considerably lower infiltration of rhodamine B dye in the group where MTA was applied. There are no errors between the material and the opposite wall, unlike the others (TORABINEJAD et.al., 1993).

The indication of this type of procedure must be considered as being an extension of the non-surgical treatment, since the etiology of the pathological process and the objectives of the treatment are the same: prevention or elimination of apical periodontitis (MARIANO, MESSORA, 2004). Therefore, surgical treatment of the root canal should not be considered separate from non-surgical treatment, although the instruments and technique are obviously different. Abitbol (1994), reports that this procedure is carried out approximately 3% to 10% in the practice of the endodontic specialty. Rosa et al. (2015), points out that endodontists perform almost 78% of surgical treatments, while general practitioners and other specialists perform 15.5% and 6.6%, respectively.

The extravasation of filling materials can contribute to treatment failure (KIM, KRATCHMAN, 2006). While this is possible and even likely with certain toxic materials (e.g. pastes containing formaldehyde), the

role of relatively inert materials such as gutta percha and filling cement is less clear, however, these materials become significant contributors if microorganisms are present. (WITHERSPOON, GUTMANN, 2000). A significant extravasation of material, especially when important anatomical areas and possibly toxic materials are involved, is an indication for referral for evaluation and possibly treatment (ARAÚJO et al,. 2004).

Contraindications can be local or general. Local ones occur when there is the possibility of treating or retracting the canal and when there is impossibility of surgical access, insufficient periodontal support, pathological processes in the acute phase and risk of injury to anatomical structures. Some of these contraindications can be minimized with operator experience. As for general contraindications, the precarious general state of health of the patient and the degree of systemic impairment are cited (BRAMANTE, BERBET, 2000).

Periapical curettage is a surgical procedure that aims to remove pathological tissue in a lesion at the apical level of a tooth or foreign bodies in the periapical region (BARNABÉ, HOLLAND, 2004). In some situations, in case of pulpal necrosis and periradicular lesion, there is formation of a periapical biofilm that is difficult to eliminate by conventional endodontic procedures and medications. This layer is colonized by bacteria that can perpetuate the periradicular lesion. Thus, periapical curettage should be performed to remove the microbial biofilm (GOMES et al., 2003).

For Lealet al., (2005), curettage should always be accompanied by an apical plasty, that is, careful smoothing of the root apex. This procedure is necessary, as the cementum that covers the apical portion of the root may be reabsorbed.

The objective of this article is to report a surgical intervention in element 45, in view of the chronic inflammatory process resulting from cement leakage and obturator cone, emphasizing the technique and the operative steps followed in the treatment to obtain the success of the procedure.

II. CASE REPORT

In the anamnesis, the patient had a previous history of endodontic treatment in tooth 44 for almost two months and presented symptoms. At that moment, no mobility or alteration in tooth color was observed. On clinical examination, there was pain on palpation. In the initial radiographic examination (Figure-01) unsatisfactory endodontic treatment was observed, extravasation of 6 mm of filling material and radiolucent area in the periapical region. In this initial X-ray, the proximity of the root apex of this dental element to the mental foramen was also analyzed, in order not to injure this anatomical structure. To assist in this analysis, a panoramic radiograph was suggested.

In view of the excess of extravasated obturator material and the difficulty in removing this material, it was decided to retreatment the dental element and simultaneously perform a surgical procedure to remove the extravasated material, thus allowing a better predictability of the case.

The patient was previously medicated for the surgical procedure. As systemic medications, the following were prescribed: Amoxicillin 500 mg + Potassium clavulanate 125 mg (every 8 hours for seven days) and Nimezulid 100 mg (every 12 hours for five days). For both drugs, he was instructed to start administration one day before the surgical procedure.

Anesthesia was then performed by blocking the right lower alveolar region, complementing the infiltrative anesthesia through the vestibular. The retreatment of tooth 44 was then carried out, to then start the surgery with an intrasulcular incision, using a scalpel blade nº 15 (Suzhou Kyuan Medical Apparatus Co. Ltd. –China), extending from the distal of the lower right canine tooth to the mesial of the lower 1st molar on the same side. The surgical flap (figure-02) was elevated with a number 7 spatula. At the time of incision and elevation of the flap, care was taken, based on the initial radiograph and panoramic radiograph, not to cause injury to the mental canal. With the aid of a 701 truncated conical drill (JET Carbide – Beavers Dental - Canada), at high speed and under abundant irrigation with saline solution (Laboratório Farmacêutico Arboreto Ltda. – Brasil), grinding was performed on the buccal cortical bone, in the region just below tooth No. 44 to join with the points of rupture of the cortical bone affected by the lesion itself. Afterwards, a chisel was also used to continue removing the bone, now in a less invasive way. This procedure was completed until the visualization of the root apex and the extravasated obturator material (figure-03), which had been extravasated, was observed. With the help of Gracey 11/12 type curettes, the extravasated filling material (figure-04) was removed. A curettage was also performed in the periapical region to remove granulomatous tissue and promote smoothing of the apical region with the aid of ultrasound (CVDentus®) with a 0.3 mm truncated conical tip with 30º and 60º bends.

During the procedure, intense irrigation with saline solution was maintained to wash the surgical site, to completely remove necrotic remains of the lesion, bone scrapings. The surgical site was cleaned and dried with

sterile gauze. Bleeding was encouraged in the periapical region until the blood filled the entire bone pocket, so that the clot formed after the bleeding would help repair the tissues involved in the surgery. The suture was performed with simple interrupted stitches in the region of the relaxing incision on the sides and interdentally in the region of the gingival papillae with Vicryl 4.0 thread (Brasuture Ind. Com. Imp. Exp. Ltda. –Brasil). A final periapical radiograph (figure-05) was performed shortly after the completion of the procedure and the extravasated obturator material was removed.

Fig.1: Initial X-ray

Fig.2: Surgical flap

Source: Own authorship

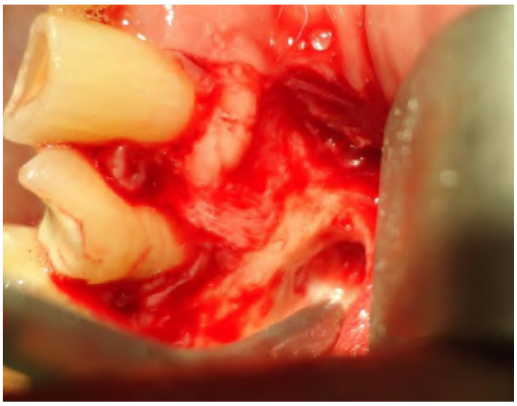

Fig.3 - visualization of the root apex and the extravasated filling material

Source: Own authorship

Fig.4 - extravasated filling material removed

Source: Own authorship

Fig.4 - extravasated filling material removed

Source: Own authorship

III. DISCUSSION

For Mariano, Messora (2004) and Gomes et al., (2003) endodontic surgery proposes to solve the problems resulting from endodontic failures, but it is a secondary alternative, since all possibilities of clinical therapy must be exhausted.

According to studies by Bottino and Feller (1992) and Chandler and Koshy (2002), the success of endodontic surgery is more guaranteed when complemented by endodontic retreatment. Therefore, our clinical planning was carried out with the association of endodontic retreatment and endodontic surgery.

Studies carried out by Bramante and Berbert (2000) one of the contraindications of surgery is the risk of injury to anatomical structures. Lower premolars have their root apices close to the mental foramen, where the lower alveolar vessels and nerves exit, which perform important functions in terms of blood irrigation and innervation. In this context, to avoid damage to this anatomical structure, a detailed study of the initial and panoramic radiographs was carried out before the surgical procedure, in order not to cause injury to this anatomical structure.

For Walton and Torabinejad (1997), overfillings are indicated for surgery if there are persistent symptoms or if radiographically the repair is not observed, which was verified during the anamnesis and the initial radiographic examination of the patient.

In the literature, Machado (2007), Marzola (2002), Von and Kurt (1999) found works in agreement with the present article in the choice of the technique of root obturation simultaneous to the surgical act, which also obtained success in carrying out such a procedure. Surgical exposure of the apex facilitates the biomechanics of the root canal, allows a more efficient obturation, with vigorous condensation without worrying about extravasation of obturation material. By removing the pathological material from the periapical, an absent conduit of exudation is obtained, allowing complete obturation and regeneration of the supporting tissue. Surgical access to the apex allows the elimination of foreign elements in the region, such as extravasated filling material or fractured instrument, or even the removal of the fractured root apex (ARAÚJO et al., 2004) and (Machado, 2007).

Contradicting the recommendations of Holland et al., (1994), periapical curettage was performed. According to the authors, who do not believe in the success of the treatment only with this surgical modality, apicectomy of the apical portion of the root is also necessary due to contamination in the ramifications, deltas, and cement craters.

Baraldi and Puricelli(2000) and Xavier and Zambrano(2001) always indicate apicectomy because, when only curettage is performed, the apex will be maintained close to the lesion area, which may persist.

According to Waltone Torabinejad (1997) and Walton (2000), when curetting a periapical lesion, portions of inflamed tissue or epithelium left will not compromise healing. This statement is in line with what was said in the study by Cohen and Burns (2000): the removal of the lesion content will lead to repair if the contaminants of the root canals are eliminated or isolated from the periapical tissues (WALTON and TORABINEJAD, 1997).

For Gagliani et al., (2005), the use of technological resources, such as ultrasound and operating microscope, during endodontic surgery becomes an excellent auxiliary resource.

Thus, in order to help in the periapical curettage procedure, it was ultrasound is used, given that, according to Von Arx and Kurt (1999), the association of the ultrasonic system manages to overcome the deficiencies observed with the manual curettage method, as the ultrasound tips are well smaller and thanks to their different conformations allow better access to the periapical region and require a smaller ostectomy area, thus preserving greater amount of healthy bone tissue.

IV. CONCLUSION

Through this clinical case, an example of clinical success and radiographic when associating endodontic retreatment with periapical curettage without the need for odontosection of the apical portion of the tooth root. Technological advances, such as the ultrasonic system, represent an excellent auxiliary means for endodontic surgery.

REFERENCES

[1] Abitbol P.V. Analysis of a referral-based endodontic practice. Part 2. Treatament provided, J. Endodon 20:253, 1994.

[2] Araújo EF, Gomes APM, Silva EG, Castilho JCM, Camargo CHR. Obturação do canal radicular simultânea ao ato cirúrgico: caso clínico J Bras Clín Odontol Integr. 2004; 8: 319-23.

[3] Araújo RA, Delboni MG, Bueno CES, Miguita KB, Cunha RS. Avaliação do selamento apical após retroobturações com utilização de duas diferentes marcas de MTA. **Jornal Brasileiro de Endodontia**2004;5(17):150-6.

[4] Bramante CM, Berbert A. Cirurgia paraendodôntica. São Paulo: Santos; 2000.

[5] Bernabé PFE, Holland R. Cirurgia paraendodôntica: como praticá-la com embasamento científico. In: Estrela C. Ciência endodôntica. v. 2. São Paulo: Artes Médicas; 2004. p 657-797.

[6] Bernabé PFE, Holland R. Cirurgia paraendodôntica: quando e como realizá-la. In: Gonçalves EAN, Feller C. Atualização na clínica odontológica. São Paulo: Artes Médicas; 1998. p. 217-54.

[7] Bottino M, Feller C. Atualizaçãona clínica odontológica: o dia a dia do clínico geral. 1. ed. São Paulo: Artes Médicas; 1992. p. 23-32.

[8] Chandler NP, Koshy S. The changing role of the apicectomy operation in dentistry. J R Coll Surg Edinb. 2002 Oct;47(5):660-7.

[9] Cohen S, Burns RC. Caminhos da polpa. 7. ed. Rio de Janeiro: Guanabara Koogan; 2000. p. 573-621.

[10] Gagliani MM, Gorni FGM, Strohmenger L. Periapical resurgery versus periapical surgery: a 5-year longitudinal comparison. Int Endod J. 2005 May;38(5):320-7.
[11] Gomes AAA, Dourado AT, Dias EOS, Albuquerque DS. Conduta terapêutica em dente com lesão refratária ao tratamento endodôntico convencional e cirúrgico –caso clínico. Rev ctbmf upe-fop. 2003 Jan-Mar;3(1):23-9.
[12] Holland R, Otoboni Filho JA, Bernabé PFE, Nery MJ, Souza V, Berbert A. Effect of root canal status on periodontal healing after surgical injury in dogs. Endod Dent Traumatol. 1994 Apr;10 (2):77-82.
[13] Kim S, Kratchman S. Modern endodontic surgery concepts and practice: a review.J Endod. 2006; 32: 601-23.
[14] Leal JM, Bampa JU, Poliseli Neto A. Cirurgias paraendodônticas: indicações, contra-indicações, modalidades cirúrgicas. In: Leonardo MR.
[15] Endodontia –tratamento de canais radiculares: princípios técnicos e biológicos. São Paulo: Artes Médicas; 2005. p. 1.263-343.
[16] Mariano RC, Messora MR. Cirurgia periapical: aplicação de princípios básicos de técnica cirúrgica. Relato de caso. Revista Portuguesa de Estomatologia, Medicina Dentária e Cirurgia Maxilofacial. 2004;45(3):155-61.
[17] Machado MEL. Endodontia –da biologia à técnica. 1. ed.São Paulo: Santos; 2007.
[18] Marzola C. Cirurgia pré-protética. 3. ed. São Paulo: Pancast; 2002.
[19] Von Arx T, Kurt B. Root-end cavity preparation after apicoectomy using a new type of sonic and diamond-surfaced retrotip: a 1-year follow-up study. J Oral Maxilofac Surg. 1999 Jun;57(6):656-61.
[20] Walton RE. Princípios de cirurgia endodôntica. 3. ed. Rio de Janeiro: Guanabara Koogan; 2000.
[21] Walton RE, Torabinejad M. Princípios e prática em Endodontia. 2. ed. São Paulo: Santos; 1997.
[22] Xavier CB, Zambrano CBB. Avaliaçãoda ressecção apical e indicação de materiais retrobturadores, em cirurgias parendodônticas, no Brasil –estudo de campo. Rev Bras Cir Implantod. 2001 Oct-Dec;32(8):325-42.