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CONTENTS

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PERIAPICAL LESIONS: CURRENT MODALITIES

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Abstract: In cases with periapical lesions, there are two types of treatment modalities: noninvasive and invasive. The first one noninvasive is also known as nonsurgical or endodontic treatment. The second one – invasive method is surgical approach. In some cases, there is a need for combination of both aproaches. In everydays clinical treatment, the first choice is less invasive method and has better outcomes. Treatment of some periapical lesions (like cysts) are a theme of discussion and we do not have best option to treat them. The patient should make the definitive decision about the treatment. The doctor should inform him about the advantages and disadvantages of endodontic-noninvasive and surgical-invasive procedure. The therapeutic modalities for these pathologies are a wide range of treatment from endodontic treatment to different surgical options. We like to find out and present the best way about healing the periapical lesion. We wanted to know whenever surgical or non-surgical approach is better, and if using them might improve healing of those pathologies. The aim was clear and to reach it, we make an electronic search of medical and dental literature. We searched the following electronic databases: PubMed and Embase Ovid. Inclusion and exclusion criteria were used to reach the aim of this review study. We place restriction about language (only those articles that are written on English) and publication date (articles that are not older than 2010 year). We excluded duplicate article. We searched the references of the studies that we included for those review. We searched by hand the reference list of the studies and journals in the fields of endodontics and oral surgery. Every periapical lesion should firstly begin with good performed endodontic treatment. In some cases, there is a need for surgical approach of periapical pathologies because the endodontic treatment is not successful. Some cases might fail because of multipurpose factors such as: foreign body reaction, the size of the periapical lesion, biofilm, oral health and oral hygiene. A surgical approach is an option in cases when periapical lesion is large. Marsupialization might be the adequate option of treatment for those lesions in some cases. In cases with postoperative periapical lesion there is a need for surgical retrograde treatment. The procedure can be performed with hand endodontic instruments to make mechanical treatment of the root canal especially the part that is untreated. The advantages, disadvantages and modalities of treatment of periapical lesions are discussed in this review. According to these review there is no evidence that the first approach leads to better results compared to the second approach. This conclusion is based on electronic research of the literature database and clinical trials. There are several options for treatment to eliminate the clinical problems of periapical lesions but furder research is necessary. This review article is about the benefits of both approaches, and to determinate the best treatment modalities of cases with periapical pathologies, healing and postoperative quality of dental life.

Keywords: periapical lesions, endodontic treatment, surgical treatment.

INTRODUCTION

Periapical lesions (PAL) are pathological conditions that did not allow the bacteria to spread into the periapical tissues. PAL are commonly of endodontic origin and rarely of the pulp (Tsesis I., 2020). The majority of PAL are: granulomas, periapical cysts, or abscesses. Those lesions are radiolucent and that means we can detect them on RTG view. Cone beam computed tomography (CBCT) has better results about imaging the lesions because of the three-dimensional view (Pitcher B, 2017). In this study where 2030 cysts are analyzed, the prevalence of periapical cysts was 42% and the most common diagnosis were: cysts of the jaws. The majority of periapical lesions heal with the help of immune defense of the human, but in some cases, there is a need of therapeutic treatment. Nonsurgical and surgical treatment have high level of success of treating and healing them. Firstly, there is a need for less invasive methods that have better outcomes. All inflammatory periapical lesions should be initially treated with conservative nonsurgical procedures (Lin, 2007). Treatment of some periapical lesions (like cysts) are a matter of discussion and the best possible way to treat them is still optional depending of the characteristics of case. The patient should make the definitive decision about the treating process. The clinician should inform him about the advantages and disadvantages of endodontic-noninvasive and surgical-invasive procedure. The therapeutic aproaches for PAL are a wide range of treatment from endodontic treatment to different surgical options. The decision which therapy is better is often based on the experience of the

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doctor. More studies have assessed the relative importance of the different factors involved in the decision to perform periapical surgery (Şimşek-Kaya, 2018).

AIM

The purpose of this review study is: to find out and present the best way to treat and heal the periapical lesion. We wanted to know whenever surgical or non-surgical treatment is better, and to find out the new specific procedure for healing the periapical pathologies.

MATERIALS AND METHODS

SEARCH METHOD:

This article review was carried out by two electronic data researchers. The first one was the electronic database MEDLINE via PubMed and the second one was the electronic database Embase Ovid. Key words: “periapical lesions”, “endodontic treatment of periapical lesion” and “surgical treatment of periapical lesion” were entered in research zone. Inclusion and exclusion criteria were used to reach the aim of this review study.

SELECTION CRITERIA:

The inclusion criteria for the articles selection were: articles published after 2010, “full text” articles, literature review articles and research articles. “Case report” articles, articles with publication date prior to 2010 and duplicate articles were excluded. Also, we place restriction about language (only those articles that are written on English). Those were exclusion criteria.

We searched the references of the studies that are included. In addition, we searched by hand the references and journals in the fields of endodontics and oral surgery. We wanted to know whenever surgical or non-surgical approach is better, and if using them might improve healing of those pathologies.

DISCUSSION

The patients should make the definitive decision about the treatment. The clinician should help in this decision process by providing the relevant information. The patient should decide for treatment that the doctor mostly recommend (Prada, 2019). CBCT compared to two-dimensional imaging methods, can preview more details about the periapical pathosis (Kruse C, 2015), and can help in treatment process, no matter it is endodontic or surgical approach (Karabucak, 2016), especially low dose CBCT (Al-Haj Husain, 2021).

Patients decide for endodontic treatment because they feel less discomfort, there is no flaps and it is a minimally invasive technique (Karamifar, 2020). The bacteria, which are in root canal, play main role in the formation of periradicular pathosis.

It is possible, to stop bacteria to take part in periapical tissue, through non-surgical and non-invasive endodontic treatment. When first treatment option is endodontic, chlorhexidine is used. The role of it, is: root canal irrigant and an intracanal medicament (Naenni N, 2014).

In other study by Haapasalo, et al. (2014), is used NAOCL like intracanal irrigation and shown that the role of tissue dissolution is completed with Multisonic Ultracleaning System and has the fastest rate. (with the next protocol: 1.0% ± 0.1% per second using 0.5% NaOCl, 2.3% ± 0.9% per second using 3% NaOCl, and 2.9% ± 0.7% per second using 6% NaOCl). According to some researchers in the endodontic treatment, some systemic antibiotic therapy is needed to restrict the infection (Segura-Egea, 2017). Disinfection with diode laser could be more effective in combination with any other irrigant in treatment of periapical lesions (Bytyqi, 2021). In addition, ultrasonic devices versus handpiece burs, types of root-end filling material: gutta-percha, super-ethoxy benzoic acid, some restorative material, glass ionomer cement, mineral trioxide aggregate, are the most common used endodontic options when periapical pathosis are the cases. Del Fabbro et al. (2016) have shown that after one year following up, there was better result of healing when root canal filling is with MTA ending, than when they were with smoothing of orthograde root filling. (RR 1.60, 95% CI 1.14 to 2.24; one RCT, 46 participants; low quality evidence). This study has shown that CBCT is not rather than radiography for preoperative evaluation and his role in healing is not important. It should be noted when orthograde retreatment fails to provide predictable outcomes or cannot be performed. Some researchers claim endodontic surgery technique is the appropriate procedure for periapical lesions, and can be performed with ultrasonic or hand files to make mehanohemical processing of the untreated part of the canal (Alghamdi, 2020). Periapical surgery

is an endodontic procedure to treat periapical lesion, where firstly surgical flap is done. The treatment focuses on removing a part of a root with anatomical complexities and untreated part of the canal. It stops the bacteria to leak in the canal by sealing the root canal apically. It eliminate the apical part of the root canal, and remove the periapical lesion. The purpose was to optimize the conditions and to heal the PAL (Del Fabbro, 2016).

Root canal treatment fails in cases when the treatment is not done with the basic standards. In some cases with PAL, there is failure of the endodontic treatment, especially when lege artis is made, such as: ledges, zipping, and perforation. This is because of the interferation between uninstrumented part of the canal that is infected and the part with lege artis. (Lopes, 2010)

A study made by Metzger at al. (2010) compared the healing process of the technique of Apexum with the conventional root canal treatment. After three months, 87% of the periapical lesions completely healed. After six months, 95% of the lesions in the Apexum group showed advanced or complete healing. Apexum is minimally invasive removal of periapical chronically inflamed tissues through a root canal access to heal the periapical pathosis.

The surgical treatment options for periradicular lesions (cysts) include the enucleation of small lesions, marsupialization to decompress in case with large lesions and it can be combination of these two modalities (Consolo, 2020). Decompression relieves the pressure within a cyst.

Zubizarreta-Macho et al. (2022) has shown the use of bovine-derived and synthetic hydroxyapatite bone grafts in cases where bone loss is, because of periapical lesion. They make a comparative analyze of the clinical and radiographic results of bovine-derived and synthetic hydroxyapatite bone grafts after treatment with endodontic surgery.

In some cases, there are results of use of colostrum as a good biomaterial to fill the part where the bone defect is, after appropriate periapical invasive surgery (Veeramachaneni, 2017).

CONCLUSION

In cases with periapical pathologies, the current treatment modalities are: endodontic treatment and retreatment, periapical surgery, marsupialization and decompression. Those treatment aproaches show results of recovery and healing and elongate the dental life. In literature, there is a high success rate of nonsurgical treatment of periapical lesions. First option of treatment before we decide to surgery should be nonsurgical approach.

This knowledge would not only help clinicians about the decision for endodontic treatment and realization. Some pathological conditions has remained a matter of discussion because we do not have best option to treat them. The main problem is that, in most cases, there is a need for surgical treatment after endodontic failure treatment. There is no clear evidence in the literature, of superiority of the first or of the second option in healing and recovery period of dental life. Further research is necessary to complete the imagine about the surgical or non-surgical approaches, and to make a decision about which surgical procedures provide quality dental life.

Conflict of interests

The author declares no conflict of interest.

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