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The Progress Healing Of Periapical Lession In Asymptomatic Apical Periodontitis Using Bioceramic Sealer: A Case Report

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Abstract:
Background*: Asymptomatic apical periodontitis is a condition that occurs in non-vital teeth accompanied by periapical lesions and does not cause complaints in patients. In establishing the diagnosis requires a proper history, clinical examination and appropriate objective examination in order to obtain adequate treatment.Adequate endodontic treatment and the use of materials containing strong antibacterials are required. Good obturation is a supporting factor, bioceramic sealer is very good to be used as an obturation material with high antibacterial power.*
Purpose:*The aim of this case report is to evaluate conventional endodontics as a non-surgical management of teeth with asymptomatic apical periodontitis.*
Case:*A male patient aged 30 years, came with a complaint of a cavity in his left back tooth, the tooth had been treated and filled by a previous dentist about four years ago but because the filling was broken, the tooth had pain about 2 weeks ago but currently no complaints. The patient had no history of systemic disease.*
Case Management: *non-vital root canal treatment is carried out with final restoration of cuspal coverage direct resin composite. Evaluation was done to see the healing of the periapical lesion.*
Conclusion:*Adequate root canal treatment affects the success of endodontic treatment, in this case there was very good progress in healing the periapical lesion.*
Key Word*:Asymptomatic apical periodontitis, Dental management, Previously initiated therapy, Periapical lesion.*

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I. Introduction

Asymptomatic apical periodontitis is a chronic inflammatory condition in periradicular tissue from non-vital pulp, due to bacteria left in the root canal.It is an immune response results in bone destruction by osteoclasts. Adequate endodontic treatment and the use of bioactive materials support the success of endodontic treatment**.** Good obturation with good sealing material is one of supporting factor, bioceramic sealer is very good to be used as an obturation material with many advantages. [1,2,3]

The aim of this case report is to discuss adequate root canal treatment with the concept oftriad endodontic for treatment previously initiated therapy with asymptomatic apical periodontitis using bioceramic sealer.

II. Case Report

A male patient aged 30 years, came to the Clinic of the Department of Dental Conservation, Faculty of Dentistry, University of North Sumatra. The main complaint was the cavities of the left molars, these teeth had been treated and filled by a previous dentist about four years ago. The filling has been broken, about 2 weeks ago the tooth was sore but now it doesn't hurt. The patient had no history of systemic disease.

On clinical examination, intra-oral tooth 36 percussion, palpation and mobility were negative, pulp vitality examination was negative (figure 1). Radiographic examination showed radiolucency in the periapical area of the mesial root of about 3 mm, widening of the periodontal ligament, the lamina dura was severed and the crown of the orifice had been opened (figure 2). Tooth 36 was diagnosed with previously initiated therapy with asymptomatic apical periodontitis.

Intra-oral photos were taken in occlusion from the front, right and left buccal directions (figure 3) and taken from the occlusal direction of the maxilla and mandible (figure 4). Visible tooth alignment is not good. In addition, tooth 37 was found with a broken composite restoration (figure 5) but the tooth had no complaints, percussion, palpation and mobility were negative, the pulp vitality examination was sensitive.

The treatment plan that will be carried out on tooth 36 is Occlusal Adjustment with non vital root canal treatment, core build up with fibre reinforce compositeand full coverage restoration direct composites. Tooth 37 restoration with composite resin.

Figure 1 . Preoperative, teeth with cracked fillings

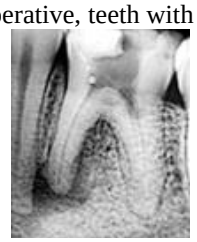

Figure 2. Periapical radiograph of tooth 36

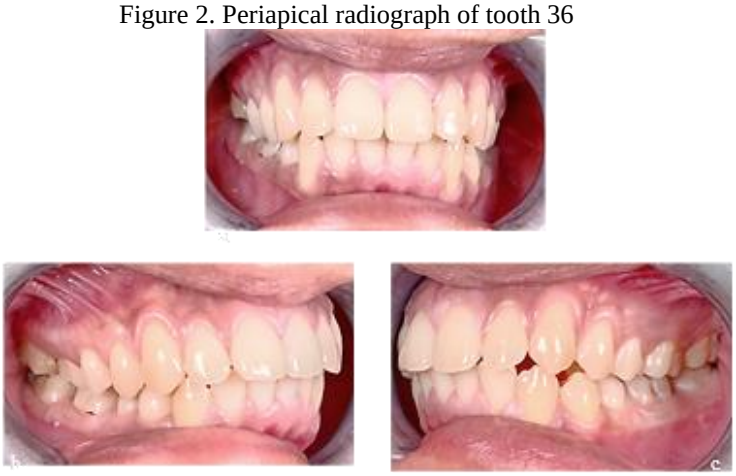

Figure 3. Occlusion

Figure 4.Maxillary occlusal view and lower jaw occlusal view

Figure 5. preoperative

III. Case Management

In the first visit, informed consent was made, occlusal adjustment was made and then tooth 36 was isolated using a rubber dam. The tooth was irrigated with 5.25% sodium hypoclorite and saline to remove all debris and necrotic tissue. Followed by root canal exploration using K-file # 10, measuring the working length using the apex locater; IAF (initial apical file) mesio buccal file #15/20 mm, mesio palatal #20/19 mm, disto buccal #15/20 mm, disto palatal # 20/19 mm (VDW) with apex locator (VDW Gold) confirmed with X-ray photo. Then proceed with preparation with reciproc blue, irrigation with 5.25% sodium hypoclorite, sonic activation (Eddy) 20-30 seconds, saline, 17% EDTA for 1 minute, saline, then the root canal was dried with a paper point and dressing with calcium hydroxide (Ultracal) for 2 weeks and temporary restoration.

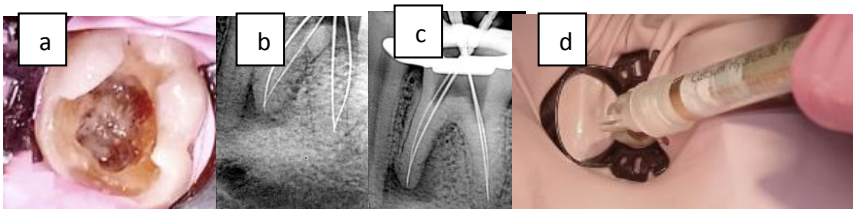

Figure 6a. orifice opening. b.c. initial apical filewith periapical radiography. d. dressing with Calcium Hydroxide

At the second visit two weeks later, clinical examination of percussion, palpation and mobility was negative on tooth 36 and there were no complaints. Followed by the rubber dam placement and the opening of the temporary restoration, then the root canal was irrigated with 5.25% sodium hypoclorite and saline, agitated with sonic frequency (Eddy, VDW), followed by MAF (Master Apical File) with mesiobuccal blue resiproc file #25/20 mm, mesio-palatal #40/19 mm, disto-buccal #25/20 mm, disto-palatal #40/19 mm (VDW). Irrigation again with irrigation with sodium hypoclorite 5.25%, sonic activation (Eddy) 20-30 seconds, saline, 17% EDTA for 1 minute, saline. Dry the root canal with paper points. MAC (Master apical cone) got tug back, mesio buccal gutta percha reciprocal #25/20 mm, mesio palatal #40/19 mm, disto buccal #25/20 mm, disto palate #40/19 mm (VDW), X-ray photo. Obturation with a bioceramic sealer (Ceraseal) with a single cone hydraulic condensation (fast pack eigteeth) technique, closing the orifice barrier with RMGIC, Nova. Core build up (palfique bulk fill flow) and full coverage direct resin composite restoration (Palfique A3) + fiber reinforced composite (EverX Posterior, GC) (Figure 7), on 37 teeth of class 1 rkrestoration. Patient instructions for control after a week.

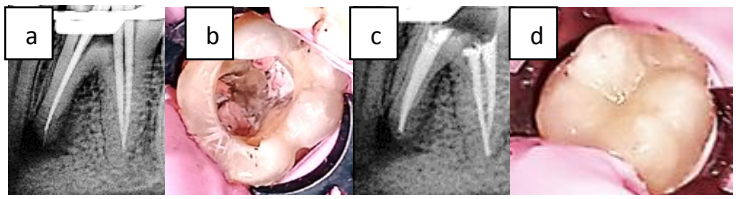

Figure 7a. MAC. b. Obturation clinic. c. Obturation. d. Cuspal coverage direct resin composite

At the post-filling control 7 days later, there were no subjective symptoms, negative percussion and palpation, no swelling.After 3 months of follow-up, clinical evaluation was performed patient had no pain and complain, evaluation with periapical radiograph showed that the lesion had shrunk (Fig. 8)

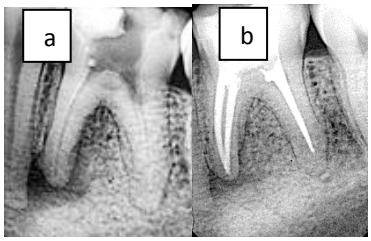

Figure 8. Evaluation of periapical radiograph after one year shows that the lesion healing

IV. Discussion

Periapical lesions may be caused by microbes in the root canal system, usually after pulp necrosis has occurred. Bacteria are the main microorganisms besides viruses and fungi in apical periodontitis. These irritants move apically from the root canal system to the periradicular tissue and initiate inflammation and tissue

changes.Asymptomatic apical periodontitis develops after relief of the acute phase and infection as a result of caries, trauma, and iatrogenic procedures. [4]

Histologically, apical periodontitis lesions are classified as granulomas or cysts. Periapical granulomas consist of granulomatous tissue consisting of mast cells, macrophages, lymphocytes, plasma cells, and polymorphonuclear neutrophil leukocytes (PMNs). [5]

Adequate conventional endodontic treatment is determined by several things that are incorporated in the endodontic triad, namely cleaning of necrotic tissue and bacteria from the root canal that irritates the periapical area, application of medicament materials to the root canal, hermetic obturation and good final restoration. Removal of necrotic tissue in the root canal will stimulate a regeneration. [6.7]

In this case, dental treatment 36 was carried out with the triad endodontic concept, namely cleaning of necrotic tissue and bacteria from the root canal with adequate chemomechanical preparation, adequate sterilization by administering calcium hydroxide medication in the root canal for 2 weeks, and hermetic filling of the root canal with bioceramic sealer.

Treatment with calcium hydroxide can stimulate healing of the apical surrounding lesion. Calcium hydroxide has an anti-bacterial effect which is influenced by the number of OH- ions released, resulting in hydrolysis of bacterial polysaccharides, increasing cell membrane permeability, protein denaturation and enzyme inactivation and DNA damage. [8.9]

In this case, the periapical lesion was reduced after 3 months of endodontic treatment. This can be seen from the negative clinical evaluation of percussion, palpation and mobility, the patient has no complaints and radiographic evaluation shows a reduced size of the periapical lesion indicating healing.

The prognosis of tooth 36 was assessed based on pre-operative, intra-operative and post-operative factors. Factors preoperative diagnosis of pulp was previously initiated therapy, periodontal diagnosis was asymptomatic apical periodontitis, periapical lesion was found to be about 4 mm, previous root canal treatment was inadequate and patient had no systemic disease. Intraoperative factors, good instrumentation with good cleaning and shaping with adequate root canal preparation and irrigation techniques, obturation material using a bioceramic sealer which has advantages in terms of antibacterial, biocompatible, remineralization and good adhesion to the root canal. Postoperative factors, restoration with core and cuspal coverage restoration direct composite both in terms of aesthetics and biomechanics. Based on these assessment criteria, the prognosis is favorable. [9.10]

V. Conclusion

Asymptomatic apical periodontitis cases can be resolved by adequate conventional non-surgical endodontic treatment withconsep of triad endodonti**.** Clinical and radiographic observation is required until the periapical lesion appears to shrink to confirm healing.The use of bioceramic sealer with hydraulic condensation technique greatly supports the healing process of periapical lesions with various advantages of bioceramic.

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