



Extraction of the posterior maxillary tooth with the crown fracture and dilaceration of palatal roots

Ridhofar Akbar Khusnul Abdillah¹, Koko Muzari¹, Salsabila Nurmalia¹ and Bambang Tri Hartomo^{2, 3}

¹ Postgraduate Program, Faculty of Dental Medicine, Airlangga University, Surabaya, Indonesia

² Dental Medicine Study Program, Faculty of Medicine, Jenderal Soedirman University, Purwokerto, Indonesia

³ Jenderal Soedirman Dental and Oral Maxillofacial Hospital, Purwokerto, Indonesia

Correspondence Author: Ridhofar Akbar Khusnul Abdillah

Received 28 March 2024; Accepted 2 May 2024; Published 15 May 2024

Abstract

Caries that are not treated early will cause the tooth structure to be damaged and ultimately untenable, so extraction must be carried out. The process of tooth extraction can experience complications or complicating conditions if there is root dilation. An extraction can be followed by separated of the root when has a dilaceration root. This paper reported a 57-year-old female patient came to the clinic complaining pain in her teeth in the right upper jaw since a year ago. To enforce diagnostics are used through deep anamnesis to patients and objective examinations. Treatment of a patient is the extraction of the tooth by the method of separation root and medical drugs. The extraction procedure is done and the patient works well without any complication. The extraction perform was done and there is no complication occurs. The procedure for extracting the tooth with a root laceration can be performed by separating the tooth and reducing the surrounding bone to make it easier to remove the tooth from its socket.

Keywords: caries, dilaceration root, extraction, fracture tooth, separated root

1. Introduction

Health is a healthy condition including physical, mental, and social which can improve the standard of living of each individual productively including in dental and oral health. One of the most common problem dental and oral diseases is dental caries which attacks at productive age with a prevalence of 67.3% in Indonesia. Caries is a disease that can dissolve organic and inorganic matrices in hard tooth tissues including enamel, dentin, and cementum [1, 2].

Tooth extraction is a surgical procedure in dentistry that aims to remove a tooth in its socket that cannot be maintained because of certain reasons, such as caries, chronic periodontitis, and residual roots that cannot be treated with root canals. The process of tooth extraction can be complicating conditions if there is root dilation. Root dilation is a rare condition that occurs at the roots or around the cemento-enamel junction so that the roots that should be straight become oblique [3-5].

The extraction procedure can also cause fracture of the crown if the crown is inadequate or if the crown has a large area of restoration. This condition is a concern of dentists who will carry out the extraction to be more vigilant and careful so that the crown does not fracture and leaves remaining roots that are difficult to reach with pliers [6, 7].

This case report describes the procedure for extraction of the maxillary posterior teeth. Tooth extraction in the posterior maxilla often experiences problems during the extraction process, such as root dilation and caused fracture, so it is necessary to reduce the alveolar bone to make it easier to remove the tooth from the socket.

2. Case report

A 57-year-old female patient came to the Unsoed Dental Hospital on January 13, 2020 to have her loose tooth checked. The patient finds it difficult to eat and speak because he feels pain and aches. On intraoral examination it was found that there were tooth 16 with amalgam fillings on the occlusal 2/3 surface with gingival recession \pm 3mm. On the palatal side there is a tooth crown that was not attached to the root due to fracture, causing tooth unsteadiness. The patient admitted that he had never had dental treatment because he was afraid of being injected.

The patient's oral condition was excellent. The patient was also taken to periapical radiographs as follows. Subjective examination showed that the patient complained of loose teeth in the upper right back area since 3 months and wanted to be extracted without pain. The patient feels loose and uncomfortable due to pain when the patient does activities such as eating and talking.

The patient's family history is unknown, but the patient works as a household assistant daily. Examination objectively, the patient showed a good general condition in the category of compos mentis, the patient's blood pressure was 120/70 mmHg, the patient's respiration was 22 beats/minute, and the patient's pulse was 98 beats/minute.

Extraoral examination found no abnormalities such as the absence of swollen lymph nodes and intraoral examination showed tooth 16 with palpation (-), percussion (-), mobility (+), vitality (-). The tooth was also fractured in the palatal area and was filled up to 2/3 occlusal and accompanied by laceration of the palatal root (Figure 1).



Fig 1: Palatal root with dilaceration

Preoperative management of the patient is carried out with the operator's assistant to prepare several tools and materials needed in the extraction procedure.

Perioperative action begins with an asepsis procedure to avoid bacterial contamination of the oral cavity area. The asepsis procedure is performed by retracting the patient's buccal area using a glass mouth, then taking a cotton pellet and forgetting it in povidone iodine with a circular motion. Operator perform an infiltration anesthetic procedure to anesthetize the posterior superior alveolar nerves and the media and the major palatine nerves. After the anesthetized area, massage the anesthetic area to reduce pain. When the anesthesia has worked, the mucosa will appear pale white and the patient will feel numb. Then the dentist can perform an anesthetic test to check if the anesthesia has worked by inserting a sonde into the mucosa. The dentist then had to perform hand stabilization to extract the maxillary teeth using the pinch grasp technique. Luksasi tooth 16 is carried out using an elevator with a parallel method parallel to the tooth axis to the root of the loose tooth. Perform tooth extraction using forceps for the posterior maxilla with a buccal-palatal-rotation-extraction movement.

Then the palatal roots left behind can be separated. Separation was performed using bone bur and low speed. Bone burs are used to reduce the bone around the root fragment so it is loose and forceps can pinch the root fragment deeper. Then do separation of the root fragments by dividing them into 2 midlines. A bone bur reduced the roots of the teeth around the socket, using high speed with water to prevent emphysema. The roots were then separated into 2 mid-occlusal sections using a bone bur up to a depth of 1.5mm. After that, leverage can be done using an elevator so that the roots can be extracted using forceps. After the tooth has dislodged its socket, a curettage can be performed to check for any remaining root fragments or lesions. The extraction site was also subjected to bone smoothing using a bone file if a sharp alveolar bone was found. Spooling with povidone iodine and sterile saline. I do compression or pressing the area of the extraction using a tampon.

Based on the history, the patient did not have a history of drug allergy, so postoperative action was carried out by prescribing a 500 mg amoxicillin antibiotic and 500 mg mefenamic acid

analgesic. The most effective antibiotics for post extraction are the penicillin group. Patients who experience bleeding that won't stop can be given gauze tampons that are bitten for 30 minutes to 1 hour post extraction. Then educate patients about gargling such as not rinsing too frequently after tooth extraction for up to 24 hours. Patients can rinse their mouths with salt water 3 to 4 times a day for 2 days. Patients must be diligent in brushing their teeth for at least 2 times a day to maintain hygiene oral hygiene. The operator also explains to the patient about important things after the tooth extraction process, such as the importance of making dentures. Then after months follow up patient show good wound healing (Figure 2).



Fig 2: Wound healing in socket

3. Diagnosis patient

The diagnosis in patient is necrose of pulp followed by crown root fracture.

4. Treatment plan

Based on the subjective and objective examinations that have been carried out, it was concluded that the assessment or diagnosis of this patient was tooth pulp necrosis. The treatment plan for tooth extraction tooth 16 with infiltration anesthesia to anesthetize the posterior superior alveolar nerves and the media and the major palatine nerves.

5. Discussion

Tooth extraction is a surgical procedure that is commonly found in dentistry. Extraction tooth occurs because of caries in Indonesia has a high prevalence. Tooth extraction is performed to remove the tooth from its socket because we cannot maintain it. During tooth extraction also results in injury to the soft and hard tissue areas in the oral cavity which the operator can minimize^[8, 9].

Tooth extraction must be done entirely covering the crown and roots so that it does not cause complications in the future such as cysts. Post extraction wound healing must also be considered so that the gums can close completely and without bacterial contamination around the wound area, causing the wound to heal difficult. One reason dentists do extraction is when the tooth is fractured and restoration cannot be done. Tooth extraction in the reported cases was appropriate because it was under the indications. The procedures and stages of tooth extraction are appropriate, including preoperative,

perioperative, and postoperative measures because they are standard oral surgery procedures [10-13].

The maxillary first molar teeth were the teeth that often experienced extraction complications in 15 cases per 37 samples. Root dilation can occur during tooth growth and development in the bud stage. The true etiology of root dilation is unknown, however some sources suggest that root dilation occurs as a result of trauma. The prevalence of maceration because of trauma during the growth of deciduous teeth is around 11-30%. It occurs mostly in the apical third of the incisors, canines, and premolars. In molars, it is often macerated up to two-thirds apical. The maxillary teeth had more root laser than the mandible, with a percentage of 4.6% vs 1.3% [14, 15].

In this case, deflection of the diaphragmatic epithelium could cause the maceration of the maxillary from anatomy such as the cortical bone of the maxillary sinus as in this case. The maxillary sinus in this case has an anatomical shape that descends to the inferior part of the sinus wall, so it presses on the roots of the maxillary first molar. This can cause root dilation [16].

This condition is in line with research conducted, which states that dental care with root lasers must be carried out appropriately for example taking X-rays first as in the case reported. X-rays are used as a guide to see the position of the roots contained in the alveolar bone. The use of a bone bur is recommended in the extraction procedure with bone separation because it allows instruments such as an elevator to enter closer to the apex. An elevator that goes deeper into the apex will cause the tooth to tilt more easily than the coronal one. Teeth can be cleaved by dividing the 2 midlines in the middle of the tooth apex in a transverse direction if they have not been lifted by elevator or pliers [17, 18].

Using bone bur is recommended in the extraction procedure with bone separation because it allows instruments such as an elevator to enter closer to the apex. An elevator that goes deeper into the apex will cause the tooth to tilt more easily than the coronal one. Teeth can be cleaved by dividing the 2 midlines in the middle of the tooth apex in a transverse direction if they have not been lifted by elevator or pliers. Dentists should still consider bone reduction because a large amount of bone reduction will cause additional problems such as loss of alveolar bone volume. In addition, bone loss after bone reduction can also result in necrosis in the tooth socket after the extraction. Dentists should still consider bone reduction because a large amount of bone reduction will cause additional problems such as loss of alveolar bone volume. In addition, bone loss after bone reduction can also result in necrosis in the tooth socket after the extraction [19, 20].

6. Conclusion

Tooth extraction must be done correctly and precisely. Tooth extraction procedures must cover the principle of minimal trauma to the surrounding tissue, especially in surgical methods such as bone separation. The bone separation method is an alternative option if there are several abnormalities in the tooth such as root dilation, which makes it difficult for the tooth to be removed from its socket.

Compliance with ethical standards (WJS-I-Heading no numbering)

Conflict of interest statement

The author declare no conflict of interest.

Statement of ethical approval

No ethical approval is needed.

References

1. Saputra FA, Ranimpi Y, Pilakoanny R. Kesehatan Mental dan Koping Strategi di Kudangan Kecamatan Delang Kabupaten Limandau Kalimantan Tengah : Suatu Studi Epidemiologi, *Jurnal Humanitas*. 2018;2(1):1-6.
2. Anindita Y, Kiswaluyo, Handayani A. Hubungan Tingkat Kebersihan Gigi dan Mulut pada Nelayan di Pesisir Pantai Watu Ulo Kabupaten Jember, *Jurnal Kedokteran Gigi Jember*. 2018;3(4):1-7.
3. Panglila K, Wowor K, Hutagalung B. Perbandingan Efektivitas Pemberian Asam Mefenammat dan Natrium Diklofenak Sebelum Pencabutan Gigi Terhadap Durasi Ambang Nyeri Setelah Pencabutan Gigi, *Jurnal Gigi*. 2016;4(2):124-132.
4. Karla H, Pandey H, Heena. Idiopathic Dilaceration in Deciduous Dentition: A Case Series With Review of Literature, *Journal International of Advance Research*. 2016;4(4):1457-1463.
5. Taiwo A, Ibikunle A, Braimah R. Tooth Extraction: Pattern and Etiology from Extreme Northwestern Norwegia, *Journal European Dentistry*. 2017;11(3):335-359.
6. Mamoun J, Napoletano D. Cracked Tooth Diagnosis and Treatment: An Alternative Paradigm, *Journal European Dentistry*. 2015;9(2):293-303.
7. Simamarta R. Penatalaksanaan Fraktur Mahkota dengan Teknik Fragment Reattachment, FKG Trisakti: Jakarta, 2015.
8. Fachriani Z. Distribusi Frekuensi Faktor Penyebab Ekstraksi Gigi Pasien di Rumah Sakit Umum dr. Zainoel Abidin Banda Aceh Periode Mei-Juni 2016, *Journal Caninus Dentistry*. 2001;1:32-38.
9. Fafat K, Mundra V. Extraction of Mxillary Molar Tooth Simplified: A Case Report, *Journal International of Medical Science*. 2017;16(8):61-65.
10. Walia P, Rohilla A, Choudary S. Review of Dilaceratio of Maxillary Central Incisor: A Multidisiplinary Challenge. *Journal of Pediatric Dentistry*. 2016;9(1):90-98.
11. Vettori E, Costantinedes F, Nicolin F. Factor Influencing the Onset of Intra and Post Operative Complication Following Tooth Exodonsia, *Journal of Antibiotic Basel*. 2019;8(4):264-270.
12. Prayudha A, Simandjuntak RM, Sumarta NPM. Musculoskeletal Disorder Risk Level Evaluation of Posterior Maxillary Tooth Extraction Procedures, *Dental Journal, Surabaya*. 2019;52:1.
13. Halaszynski TM. Preoperative Assesment and Evaluation for Maxillofacial Surgery, Springer International Publishing. 2018;57:9.

14. Sakkiko S, Souichi Y, Madoka F. Effect of Perioperative Oral Care on Preventif of Periperative Pneumonia Associated with Esophageal Cancer Surgery, *Journal of Medicine*. 2017;96(33):7436-7441.
15. Wirastriajeng H, Riawan L, Samsudin E. Tooth Extraction Complication and Treatments at The Exodonsia Clinic of the Oral and Dental Hospital of the Faculty of Dentistry UNPAD, *Jounral Padjajaran of Dentistry*. 2017;19(3):115-118.
16. Shresta A. Developmental Anomalies Affected Affecting the Morphology of Teeth, *Journal of Odontologia*. 2015;2(3):77-83.
17. Walia P, Rohilla A, Choudary S. Review of Dilaceratio of Maxillary Central Incisor: A Multidisiplinary Challenge, *Journal of Pediatric Dentistry*. 2016;9(1):90-98.
18. Yusuf H, Murniati N. *Komplikasi Pencabutan Gigi*, Leutika Prio: Yogyakarta, 2018.
19. Kuzekanani M, Sadeghi M. Prevalence and Distribution of Dilaceration in The Permanent Dentition of an Iranian Population, *Journal European Anatomy*. 2019;23(4):273-277.
20. Mamoun J. Use of Elevator Instrument When Luxating and Extracting Teeth Clinical Techniques, *Journal Korean Associated Oral Maxilofacial Surgery*. 2017;43(3):204-211.