

CASE REPORT

The Importance of Interdisciplinary Management in Successful Diagnosis and Treatment of Impacted Maxillary Primary and Permanent Central Incisor: A Case Report

Fitriana Fitriana¹, Rofi Nurdiansyah², Pingkan Ayu Ningtyas³

¹ Department of Oral Maxillofacial Surgery, Faculty of Dentistry, Brawijaya University, 65145, Malang, Indonesia

² Orthodontic Specialty program, Dentistry Faculty, Orthodontic Department, Airlangga University, 60132, Surabaya, Indonesia

³ Dentistry Study Program, Faculty of Dentistry, Brawijaya University, 65145, Malang, Indonesia

ABSTRACT

Impacted maxillary permanent incisor is a challenge for Oral Surgeon and Orthodontist. The incidence of this case is the third highest after unerupted third molars and canines and is more common in Asian races. Orthodontists and the oral surgeon must collaborate to define why the teeth are impacted. This report aims to describe the importance of interdisciplinary management and communication between the orthodontist and oral surgeon. This case report presents a patient 10-year-old boy with unerupted maxillary right permanent central incisor. The orthodontist and oral surgeon diagnosed it caused by odontoma. After the odontoma was removed, the tooth above the odontoma was seen mimicking the maxillary permanent central incisors. Further exploration and re-analysis show that the suspected tooth was a primary tooth that could not erupt. After a discussion, it was decided to take the primary teeth and re-explore them to look for permanent incisors. After four months of orthodontic treatment, permanent teeth erupted completely and the patient was very satisfied. Interdisciplinary management is very important to determine the right diagnosis and the success of the treatment.

Keywords: Unerupted maxillary right permanent central incisor; Interdisciplinary management; Surgical tooth exposure; Orthodontic treatment

Corresponding Author:

Fitriana, Sp.BM

Email: fitriana.drg@gmail.com

Tel: +6282-231283908

INTRODUCTION

Management is a dynamic process that includes many elements and activities that need to be implemented so that things go as expected and achieve mutual success. There are four management functions, such as planning, organizing, action, and evaluation. Many studies show that achieving optimal treatment result besides competence need two factors, such as good management and teamwork¹. In this report, teamwork can be divided into two parts, which are between the orthodontist and oral surgeon (interdisciplinary), and between the doctors and the patient (patient cooperation). Impacted maxillary permanent incisor is a challenge for Oral Surgeon and Orthodontist, for patients it can cause functional and aesthetic problems that result in psychosocial and quality of life problems.

The incidence of unerupted maxillary central incisor in 5-12 year old children is 0.13%, the prevalence is 2.6% and is more common in Asian races. A study conducted by Cray showed that unerupted maxillary central incisors were the most common among other incisors.

The majority of impacted maxillary central incisor cases are not accompanied by the impacted primary maxillary central incisor, however in this report, this common does not occur. The primary maxillary central incisor also did not erupt. This condition will be unknown if the interdisciplinary team and management treatment are inadequate. Therefore this report aims to describe the importance of interdisciplinary management in the successful diagnosis and treatment of impacted maxillary primary and permanent central incisor.

CASE REPORT

Firstly, we Planned several components, which are defining the problems list, the human resources,

and treatment steps. After that, we organized the planning for the stakeholders or the human resources. The next step was to act the treatments as the planning and to document or record every step to compare to every progression. Then, every comparison would be evaluated based on data. The results of evaluation or monitoring would be followed up to be the next planning that would be done for the next action or treatment.

This case report presents a patient 10-year-old boy with unerupted maxillary right permanent central incisor. Anamnesis obtained from parents who know very well about the patient's history is very helpful for examination. From clinical examination there was a lump of approximately 5 x 7 x 5 mm between the maxillary left permanent central incisor and the maxillary right permanent lateral incisor. The color and the temperature same as the surrounding, no abnormality in surrounding tissue, and there is no involvement of lymph nodes. Its shows the absence of teeth in the anterior. The first molar permanent relations were neutroclusion, overbite 3 mm which is normal (N), overjet 4 mm (N), and diastema on 11 regions, 11 and 21 were mesioversion (Fig. 1). The cephalometric indicators show SNA 81° (N), SNA 75° (N), ANB 4° (skeletal class I), I – SN 104° (N), I – FH = 111° (N), IMPA 107° (protrusion) I – GoGn 110° (protrusion), FMA 25° (N). We also performed the model analysis, the upper jaw available space 77.5 mm, the required space 76.4, and the diastema on the 11 region was 6 mm. The patient has been diagnosed with class I malocclusion with protrusion in the lower jaw and impacted 11.

The goal of the treatment is to extrude 11, then to level and to align it. Generally, the treatment was divided into four steps. The first was achieving the space, the second was surgical exposure, The third was extruding, leveling, and aligning, and the last



Figure 1 : Pre treatment extraoral and intraoral. There is a lump between the maxillary left permanent central incisor and maxillary right permanent lateral incisor. The patient's teeth were neutroclusion (class I angle), had a deep bite, and the face was symmetrical. The vertical proportion of the face was proportional, and the type of face was convex.

was retention. All of them were finished in nine months.

We used an MBT bracket, however, the patient denied wearing a bracket in the lower jaw so the protrusion was not corrected, fortunately, the protrusion was not significant. The first treatment was three months by using niti 0,012, 0,014, 0,016 plus open coil spring and SS wire 0,016 x 0,016. The wire was changed every 2 weeks – 4 weeks.

After we regained the space, we performed the surgical exposure. At the beginning of the treatment actually, the Orthodontist advised the patient to do a panoramic photo. The results of the panoramic photo showed a radiopaque lesion in the region of the lump, surrounded by radiolucency in the anterior area of the anterior maxilla. The quality of the radiograph panoramic photo was not quite good, it have been taken by the previous dentist and he rejected to be taken the radiograph for one more (Fig. 2). Panoramic is a technique for producing a normal level or better quality image showing the facial structures including the maxillary and mandibular jaws and their supporting structures with distortion and overlap minimal detail of the anatomy on the contralateral side when the patient is still, the light source and film rotate around the patient, the film cassette rotates on its axis and moves around the patient. Before taking panoramic images, some general guidelines must be prepared including preparation of tools, patients, operators and the environment in order to get good detail contrast and sharpness.. However, the Orthodontist diagnosed it with odontoma and planned to perform enucleation with windowing techniques on maxillary permanent central incisors. The odontoma was removed surgically with local anesthesia. After the odontoma was surgically removed, the teeth above the odontoma were seen mimicking the maxillary permanent central incisors. With a lack of quality of panoramic, the Orthodontist and Oral Surgeon have to discuss, re-exploration, and re-analysis whether this is the primary maxillary central incisor or maxillary permanent central incisor. The Orthodontist and Oral Surgeon evaluates this case intraoperative and discussed it with the parents. After some re-discussion, we found that the primary tooth could not erupt due to obstruction by odontoma (Fig. 3A and 3Da). We decided to extract the primary maxillary central incisor (Fig. 3Db) and re-explored it to identify the permanent incisor (Fig. 3B). After finding the permanent incisors (Fig. 3C), a button was placed and the wound was closed with stitches, then orthodontic treatment was continued. However, we did not take the histological examination because the sample was only part of the tooth without a capsule and any other tissue2.

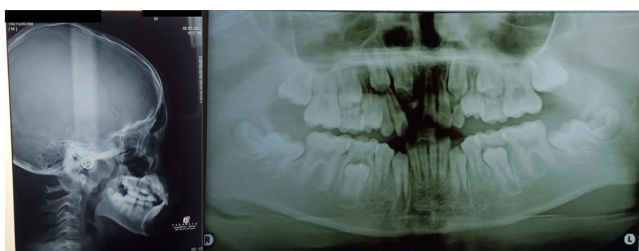


Figure 2 : Pre treatment panoramic and cephalometry radiograph. The photo showed a radiopaque lesion in the region of the lump, surrounded by radiolucency in the anterior area of the anterior maxilla. Due to the lack of facility the quality of the radiograph panoramic photo was not quite good.

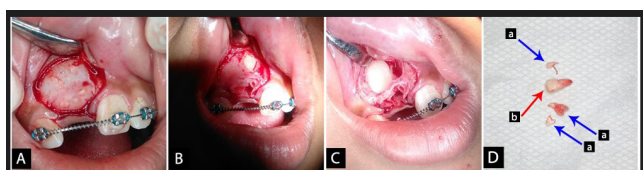


Figure 3 : IntraOp. The primary tooth could not erupt due to obstruction by odontoma (A). We decided to take the primary maxillary central incisor (B) and re-explored it to look for permanent incisors (C). The primary maxillary central incisor tooth (Db). The odontoma (Da).



Figure 3 : Post treatment extraoral photograph. The maxillary permanent central incisor erupted completely and the patient was very satisfied.

After six months of using the Piggyback technique, he maxillary right permanent central incisor erupted completely and the results were satisfactory (Fig. 4). Furthermore, after 11 has been leveled and aligned, the last step was retention. We used a fixed retainer which is made from fiber material.

DISCUSSION

There are three factors contributing to successful diagnosis and treatment in dentistry. Such as competence, good management, and teamwork¹. In this case, competence means that every dentist

has each expertise. This case was handled by two specialists, were Orthodontist and Oral Surgeon. An Orthodontist's job is to erupt and align the tooth until it can return to normal function (occlusion), with aesthetic and stable results, without replacing it with a prosthetic tooth. Whereas an Oral Surgeon has a role to open and remove the barrier which was odontoma, to give access to the tooth to be erupted by the Orthodontist.

Intra-operative discussion between the Oral surgeon and the Orthodontist was done to define the right tooth as radiographic imaging did not offer extra information due to lack of quality. An impacted primary central incisor was also successfully discovered during the operation, which was forgotten to be interrogated when pre-treatment anamnesis. (Fig. 3D)

The next factor is teamwork. The Author divided into two components of teamwork internal teamwork and external teamwork. Internal teamwork is teamwork between the operators or the doctors, nurses, and other supporting staff. Moreover, external teamwork is teamwork between the doctor and the patient.

The internal teamwork in this journal will be limited to the orthodontist and oral surgeon (interdisciplinary). According to Nancarrow, several characteristics have been a good interdisciplinary team such as good communication, leadership and management, individual characteristic, and respecting and understanding of roles³. Internal teamwork is like organization. The organization's definition is an alliance of two or more people. Usually, in the organization, there is an organization structure, leader, members as well as their job description. In this case, the Oral Surgeon was the leader the job is to lead the member to act their job description as same to their expertise which has been mentioned in the discussion's first paragraph.

External teamwork is also a very important factor, although every component is already accomplished but if this factor is not fulfilled so the treatment may not succeed. In other references, usually it is known as patient compliance. Patient compliance is a must thing in every treatment. In this case, the patient was 10 years old, so it was categorized as children's age. It means that the patient's cooperation is depending on the parents. His parents were very disciplined to fulfil the doctors' instructions and the control schedule. They always noticed the progression of their son. In addition, the progression always is communicated to the Orthodontist.

Management is a dynamic process that includes many elements and activities that need to be implemented so that things go as expected and achieve mutual success. There are four management functions, such as planning, organizing, action, and evaluation.

Firstly the Orthodontist planned the diagnosis and the treatment, by listing the problems list. After that, the leader listed the steps of treatment or the correction of each problem. Then the orthodontist drafted the timeline of the execution of the treatment and drafted the job descriptions of each team member. All of this could be categorized into planning functions in this case.

The next is the organizing function. In this step, the team leader, the oral surgeon, organized and described the planning to all team members through the meeting or discussion. The planning draft was the discussion material. After the leader explained the material, the next stage was discussion in which the member is allowed to ask or suggest his idea until the forum got a consensus.

After that, the action function was begun, we performed the preliminary orthodontic treatment, the surgical exposure, and the definitive orthodontic treatment⁴. The details steps of the treatments have been described in the case report session.

During those treatments, the team always documented every step of treatment or progress. The documentations are very important because it can be the substance for the evaluations. There are two kinds of documentation data, which are medical records and photos. This step is called the evaluation function.

During the preliminary orthodontic treatment, the Orthodontist used the data for evaluating when the surgical exposure could be performed. Then, during the surgical exposure, the Orthodontist also helped the Oral Surgeon take the pictures for documentation.

While the definitive orthodontics treatment was running the Orthodontist also always documented for the data to evaluate. We documented the pre-treatment extraoral and intraoral, there is a lump between the maxillary left permanent central incisor and right permanent lateral incisor and then we documented the post-treatment extraoral, shows that the maxillary right permanent central incisor erupted completely and the results were satisfactory. In other words, every 2 to 4 weeks the patient-controlled and came to the clinic and after the treatments

have been performed the author always noted the history of the treatments such as the patient's problem, the reposition of the dental bracket, the wire change, the stage of treatment and the next step that would be performed. Moreover, the progression or the extrusion movement of 11 was always documented by the photo to compare the previous photos and the updated photo.

This case is categorized as a complex case and has to be handled by interdisciplinary specialists. Odontoma is a benign tumor linked to tooth development and an odontogenic tumors. Odontomas are of two types, namely compound and complex odontoma. In this case, we diagnosed it with compound odontoma because the appearance is almost the same as the structure of the whole teeth⁴. Odontoma are associated with delayed tooth eruption, impaction and persistence of primary teeth. In this case, odontoma presented multiple calcified structures of different sizes and shapes. Some of them resembled deformed mini-teeth of various sizes. As for their morphology, most of the mini teeth presented a morphology rather similar to incisors. One of the most common complications due to odontomas is eruption disturbances and teeth malposition. Usually, odontoma only blocks the maxillary permanent central incisor. In this case, the odontoma obstructed the eruption of the permanent and primary maxillary central incisor. After we did the surgical exposure and put the button onto the maxillary permanent central incisor, the orthodontic treatment was continued by using the Piggyback technique. The control was done every three weeks to four weeks usually to adjust the additional wire. After four months 11 erupted completely. Finally, the patient was very satisfied.

CONCLUSION

Interdisciplinary management is very important to determine the diagnosis and treatment plan in various cases. The various cases have to be solved by the interdisciplinary specialized dentist because there are several steps of the treatments that need another expertise. The management of the treatments is a must, to achieve the success of treatment because every action in this life needs good management including the treatments in the dentistry field, particularly Interdisciplinary cases that evolve the multidiscipline and many people.

ACKNOWLEDGEMENT

The author's received no financial support for the publication of this report.

REFERENCES

1. Rosen MA, DiazGranados D, Dietz AS, et al. Teamwork in healthcare: Key discoveries enabling safer, high-quality care. *American Psychologist*. 2018;73(4):433-450. doi:10.1037/amp0000298
2. Tan C, Ekambaram M, Yiu CKY. Prevalence, characteristic features, and complications associated with the occurrence of unerupted permanent incisors. *PLOS ONE*. 2018;13(6):e0199501. doi:10.1371/journal.pone.0199501
3. Nancarrow SA, Booth A, Ariss S, Smith T, Enderby P, Roots A. Ten principles of good interdisciplinary team work. *Human Resources for Health*. 2013;11(1):19. doi:10.1186/1478-4491-11-19
4. Baldawa R, Khante K, Kalburge J, Kasat V. Orthodontic management of an impacted maxillary incisor due to odontoma. *Contemporary Clinical Dentistry*. 2011;2(1):37. doi:10.4103/0976-237X.79312