Scholars Journal of Medical Case Reports **ISSN 2347-6559 (Online)**
Sch J Med Case Rep 2014; 2(3):153-155 **ISSN 2347-9507 (Print)**

(An International Publisher for Academic and Scientific Resources) DOI: 10.36347/sjmcr.2014.v02i03.012

Restoration of an Impacted Maxillary Incisor Tooth by Using Fiber-Reinforced Composite Bridge

Ceren YILDIRIM[1], Mehmet KAPLAN[2], Aybarshan YILMAZ[3], Özlem Martı AKGÜN[1]
[1]Dr, DDS, PhD, Gulhane Medical Academy, Department of Pediatric Dentistry, Ankara, Turkey
[2]Research Assistant, DDS, Gulhane Medical Academy, Department of Orthodontics, Ankara, Turkey
[3]Research Assistant, DDS, Gulhane Medical Academy, Department of Pediatric Dentistry, Ankara, Turkey

***Corresponding Author:**
Name: Dr. Ozlem Marti Akgun
Email: ozlemmartiakgun@gmail.com

Abstract: The term "impacted teeth" refers to dentition that is partly or completely impacted in bone or soft tissue after eruption should have been completed although eruption age is completed not replaced in dental arc. The most commonly impacted teeth in the anterior region are maxillary canines, while the prevalence of impacted maxillary incisors ranges from 0.06% to 0.2%. Impacted maxillary incisors are of particular concern because they adversely affect a patient both aesthetically and psychologically at an early age. This case report investigates the replacement of an impacted right maxillary central incisor with the patient's own tooth. The incisor was extracted surgically, space was created with fixed orthodontic treatment, and a fiber-reinforced composite dental bridge was created using the extracted tooth.
Keywords: Maxillary central incisor, Fiber-Reinforced Composite Bridge, Impacted teeth

INTRODUCTION

Impaction of anterior teeth may be caused by a variety of factors, both local and systemic. Local reasons include the presence of an odontoma or super numerary teeth, space loss, positioning of adjacent teeth, morphologic structure, compression of teeth, intensity of bone structure and soft tissue, or chronic inflammation of the environmental mucosa [1,2]. Systemic factors that may play a role include heredity, rachitism, anemia, congenital syphilis, tuberculosis, or endocrine disorders [3]. A team-based approach involving a pediatric dentist, orthodontist, and oral maxillofacial surgeon is required when treating impacted teeth [4]. Updated periapical radiographs must be reviewed, and the position and morphology of the impacted tooth as well as the surrounding available space should be evaluated to determine whether surgical intervention is necessary. If a more conservative approach utilizing orthodontic treatment alone does not achieve the desired response, extraction can be considered [5].

In accordance with the recent emphasis on minimally invasive dentistry, new research has focused on the construction of polyethylene fiber-reinforced resin-bonded bridges to replace single missing teeth [6, 7]. Resin-bonded bridges are a type of fixed partial denture that use micromechanical retention gained from the composite resin cement as well as retentive features cut in enamel to adhere to the adjacent abutment teeth. Ribbond™ is a biocompatible, colorless, translucent polyethylene fiber that can be used to reinforce these composite restorations. It is resistant to abrasion and has a low coefficient of friction [8, 9].

CASE REPORT

An 11-year-old boy with no systemic diseases or complications was referred to the GATA Department of Pediatric Dentistry with a chief complaint of an unerupted maxillary right central incisor. A brief history was taken and revealed that the maxillary primary right central incisor had been intruded due to trauma when the patient was 4 years old, likely having an adverse affect on the succedaneous tooth. Clinical examination verified that the anterior tooth was not erupted, and radiographic exam showed that it was impacted horizontally in the sagittal plane (Fig. 1). After consultation with the orthodontist, the decision was made to attempt to conservatively erupt the tooth using braces alone. However, due to the dilaceration of the root, a likely consequence of the intrusion of the corresponding primary incisor years before, the tooth could not be extruded. Instead, it was surgically extracted and maintained until the fixed orthodontic treatment had created adequate space in the anterior region for the planned restoration (Fig. 2-4). The brackets were removed, and to satisfy the patient's request for a fixed restoration utilizing his natural tooth, a fiber-reinforced composite bridge was fabricated with the extracted tooth (Fig. 5).

Fig. 1: Panoramic radiograph of the patient before treatment

Fig. 2: Impacted tooth was surgically extracted and maintained until the fixed orthodontic treatment

Fig. 3: Fixed orthodontic treatment was applied to the patient

Fig. 3: Clinical appearance of fixed orthodontic treatment

Fig. 5: Fiber-reinforced composite bridge with the extracted tooth

DISCUSSION

Missing or impacted maxillary incisors have a significant adverse affect on dental and facial aesthetics [10]. Causes of impaction include the presence of odontomas, supernumerary teeth, and cysts, which create obstacles to the path of eruption. This condition can also be a consequence of tooth malformation, root dilaceration, ectopic positioning, non-vital or ankylosed primary teeth, early extraction of primary teeth, or endocrine disorders and bone disease [11, 12]. The root dilaceration mentioned above may occur in permanent teeth when the corresponding deciduous teeth are disrupted from trauma, although the extent of the damage on the successors varies depending on their development stage as well as the direction and type of trauma [12].

Early diagnosis of eruption delay is a critical factor affecting the success of treatment, and a variety of treatment approaches are used to resolve this condition [13-15]. If an obstruction exists, it can be removed, and spontaneous eruption of the impacted tooth may occur if sufficient space is present. Sometimes, surgical exposure of the tooth in

conjunction with orthodontic treatment is required [14, 15]. If there is widespread pathology jeopardizing the health of adjacent teeth, or excessive ectopic eruption, dilaceration, or malformation, extraction of the impacted tooth is required [16, 17]. In the case discussed, the degree of malpositioning as well as the extent of root dilaceration of the impacted maxillary central incisor caused orthodontic traction to be unsuccessful, and so the tooth was surgically extracted and space was then gained with orthodontic treatment [18, 19].

Once an impacted tooth is extracted and adequate space is created for a replacement tooth, there are a variety of fixed and removable denture options that may be used to maintain the existing space and improve aesthetics, especially if the patient is not old enough to be a candidate for implant placement. One such option, the fiber-reinforced composite bridge, uses ceramic fillers and advanced polymer chemistry to provide improved function and aesthetics [20]. This restorative option is also advantageous because it can be completed in one session, exerts minimal load damage on abutment teeth, allows for the creation of hygienic interdental spaces, and can be easily repaired without complicated techniques or materials [21]. Since the patient in the discussed case did not want a removable prosthesis to replace the missing anterior tooth, the fiber-reinforced composite bridge using the patient's extracted tooth as a pontic served as a viable and appealing alternative.

CONCLUSION

When unerupted incisors are noted during a clinical exam, the dentist must determine the cause and prepare an appropriate treatment plan in conjunction with a pediatric dentist, orthodontist, and oral maxillofacial surgeon. Although impacted maxillary incisors are rarely observed, early diagnosis is critical to improving the success of treatment and, consequently, the facial aesthetics of the person affected.

REFERENCES

1. Huber KL, Suri L, Taneja P; Eruption disturbances of the maxillary incisors: a literature review. J Clin Pediatr Dent., 2008; 32(3): 221-230.
2. Chokron A, Reveret S, Salmon B, Vermelin L; Strategies for treating an impacted maxillary central incisor. Int Orthod., 2010; 8(2): 152-176.
3. Bayram M, Ozer M, Sener I; Bilaterally impacted maxillary central incisors: Surgical exposure and orthodontic treatment: a case report. J Contemp Dent Pract., 2006; 7(4): 98-105.
4. Becker A; The Orthodontic Treatment of Impacted Teeth, London, Martin Dunitz Publishers, 1998.
5. Jena AK, Duggal R, Roychoudhury A, Parkash H; Orthodontic assisted tooth eruption in a dentigerous cyst: a case report. J Clin Pediatr Dent., 2004; 29: 33-35.
6. Van Wijlen P; A modified technique for direct, fibre-reinforced, resin-bonded bridges. Clinical case reports. J Can Dent Assoc., 2000; 66: 367-371.
7. Unlu N, Belli S; Three-year clinical evaluation of fiber-reinforced composite fixed partial dentures using prefabricated pontics. J Adhes Dent., 2006; 8(3): 183-188.
8. Ellakwa AE, Shortall AC, Marquis P; Influence of fiber type and wetting agent on the flexural properties of an indirect fiber reinforced composite. J Prosthet Dent., 2002; 88(5): 485-490.
9. Miller TE; A new material for periodontal splinting and orthodontic retention. Compend Cond Educ Dent., 1993; 14(6): 800-812.
10. Cons NC, Jenny J, Kohout FJ; DAI: the dental aesthetic index. Iowa: College of Dentistry, University of Iowa; 1986.
11. Huber KL, Suri L, Taneja P; Eruption disturbances of the maxillary incisors: a literature review. J Clin Pediatr Dent., 2008; 32(3): 221-230.
12. Jones JW; A Medico-legal Review of Some Current UK Guidelines in Orthodontics: A personal View. J Orthod., 1999; 26(4): 307-324.
13. Tanki JZ, Naqash TA, Gupta A, Singh R, Jamwal A; Impacted maxillary incisors: Causes, Diagnosis and Management. IOSR Journal of Dental and Medical Sciences, 2013; 5(2): 41-45.
14. Kramer RM, Williams AC; The incidence of impacted teeth. A survey at Harlem hospital. Oral Surg Oral Med Oral Pathol., 1970; 29(2): 237-241.
15. Oliver RG, Hardy P; Practical and theoretical aspects of a method of orthodontic traction to unerupted teeth illustrated by three cases. Brit J Orthod., 1986; 13(4): 229-236.
16. Jones JW, Husain J; Management of the unerupted incisor. Dent Update, 1996; 23(1): 36-39.
17. Asher C, Lewis DH; The integration of orthodontic and restorative procedures in cases with missing maxillary incisors. Br Dent J., 1986; 160(7): 241-245.
18. Lewis DH, Eldridge DJ; Orthodontic/restorative interface. Dent Update 1992; 19(5): 195-96, 198-99.
19. Henry PJ, Laney WR, Jemt T, Harris D, Krogh PH, Polizzi G *et al*.; Osseointegrated implants for single-tooth replacement: a prospective 5-year multicenter study. Int J Oral Maxillofac Implants, 1996; 11(4): 450-455.
20. Kristensen L; Autotransplantation of human premolars: A clinical and radiological study of 100 teeth. Int J Oral Surg., 1985; 14(2): 200-213.
21. Javaheri DS; Replacement of an anterior tooth with a fiber reinforced resin bridge. Compendium, 2001; 22(1): 68-74.