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Comprehensive management of rampant adolescent caries involving multiple maxillary anterior teeth

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Abstract
Caries in anterior teeth can lead to issues that affect physical, mental, and even social well-being. Multitooth involvement and accelerated progression are hallmarks of acute caries. Adolescence rampant caries is the name given to this more prevalent adolescence stage caries. Managing it effectively requires early identification and the start of restorative and preventive therapy. Depending on the clinical and radiological state of the affected tooth, a significant number of therapeutic options are available. The case report ought to showcase a clinically intricate situation involving a 14-year-old child who has cervical caries in all maxillary incisors. Multiple approaches such as endodontic therapy, fibre post implantation, and restoration using a metal ceramic crown and composite resin, were effective in treating the affected teeth.

Keywords: Adolescent rampant caries, anterior teeth, fibre post

Introduction

Biologically speaking, adolescence is the time between infancy and maturity marked by rapid growth, shifts in social roles, and physiological changes [1]. The adolescent child is identified as having unique requirements because of the following: (1) significantly high caries rate; (2) a propensity for poor oral hygiene, poor dietary habits, and lack of regular access to oral health care; (3) more prone to periodontal disease and dental trauma; (4) an increased concern for esthetics; (5)fear of dental procedures; (7) probability to use tobacco, alcohol, and other recreational drugs; (8) desire for piercings in oral cavity; (9) unique social and psychological needs [2–7]. It is a clinical challenge that calls for knowledge, ability, and attention to detail to employ dental procedures and materials to help young people achieve a healthy and attractive smile. Adolescent patients may require sophisticated, multifaceted care. Correct diagnosis and efficient treatment planning depend on complete, accurate, and current medical, dental, and social histories. In order to reduce the possibility of exacerbating a systemic condition while providing dental treatment, it is imperative to be familiar with the patient's history of medical conditions. When it comes to optimising dental restorations for adolescents, material selection is crucial. It is important to take into account the tooth that has to be restored, the patient's caries risk, the restoration's location, and the forces that the restoration will be exposed to when deciding which material to use for the restoration. In this instance, a pattern of widespread caries in children is demonstrated by the significant involvement of caries of all permanent teeth, with the exception of the mandibular incisors and canines. Because of the extreme carious destruction of the maxillary anterior teeth, metal ceramic crowns, fibre posts, and root canal treatment (RCT) had to be administered.

Case report

A 14-year-old male patient visited the department of conservative dentistry and endodontics, presented with pain and poor appearance of maxillary anterior teeth. He seemed well nourished and well built. History revealed grossly carious deciduous maxillary anterior teeth with discoloration and breakdown. However, condition was ignored that time, expecting the newly erupting teeth to be caries-free. The present condition was noticed 2 years before for which he did not seek any treatment. Diet history revealed that the child has not much craving for sweet food, but there was frequent snacking present, also brushes his teeth only once daily, and practices no other oral hygiene measures.

Clinically, all maxillary incisors were discolored and carious. There was white spots and pits in maxillary canines which suggest caries initiation. Involved quadrants showed severe plaque deposition and marked gingival inflammation. Teeth 11, 12, 21, 22 have severe cervical caries. The palatal aspect of all teeth was intact. 12 was grossly decayed. Radiographic examination of 11, 12, 21, 22 showed pulpal involvement in all 4 teeth associated with mild pdl thickening. No other periapical changes were present. There was very little crown structure remaining in 12. Cold testing was done which showed no pulpal response of 12 suggesting non-vital tooth. There was hypo response of 11, 21, 22. After making the diagnosis of acute adolescent cervical caries, the charecteristics of the disease was explained to both parent and patient. The brushing technique was demonstrated. From the history, it was clear that lack of proper oral hygiene is the main cause. Explained about the importance of brushing teeth twice daily. Treatment options were explained to the patient and parent. Root canal treatment on 11, 12, 21, 22 was initiated after obtaining consent. Caries removal was done until sound tooth structure became visible. Access opening is done through the labial aspect considering the conservation of maximum sound tooth structure. Working length was established and canals were instrumented using step step-back technique. Irrigation of the canals were done with 5.25% sodium hypochlorite and normal saline. This was followed by a

calcium hydroxide dressing. After 10 days, the patient was recalled and obturation was done in all 4 teeth. After 1 week, post space was prepared on 12 & fiber post was placed and crown preparation for the metal ceramic crown was done. Other teeth were restored with composite considering the age of the patient. Het came for the next appointment with a heavy plaque load and as a means to educate the patient plaque detection was done with 2 2-tone solution and educated the patient on the process of plaque accumulation and the importance of following proper brushing technique. Plaque removal was done and the crown was cemented followed by demonstration of proper brushing technique.

Fig 1: Pre operative image showing carious involvement of 11,12,21,22

Fig 2: Sound teeth structure visible after caries removal which shows there is no involvement of root

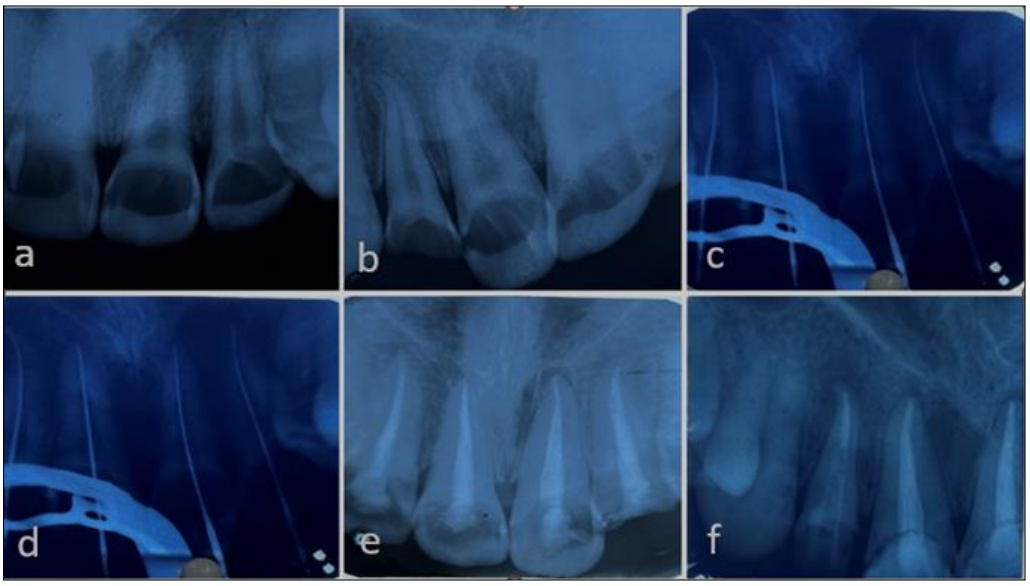

Fig 3: a, b) pre operative IOPA c) working length IOPA, d) Master cone IOPA, e) Obturation IOPA, f) post space preparation

Fig 4: Plaque detection using two tone solution Post procedure photograph

Discussion

The early adolescent years are crucial for developing healthy dental hygiene practices that carry over into adulthood [8, 9]. The challenge is that children often exhibit oppositional behaviour towards their parents and teachers during puberty, which makes it challenging to provide health education [10]. The literature has clearly demonstrated the value of brushing teeth as a critical preventative behaviour for kids and teenagers [8, 9, 11]. In our patient's case, the patient reported consuming milk and biscuits as well as not brushing their teeth before bed. This may be the underlying cause of rampant caries, another name for rapid caries. Adolescent rampant caries is the term used to describe rampant caries that develop in adolescents. Some teenagers develop the practice of putting biscuits, chocolates, and toffees in their mouths and going to sleep [1]. These kinds of individuals experience adolescent rampant caries. It follows similar pattern as nursing bottle caries. Mandibular incisors typically avoid dental cavities because their tongue shields them from the effects of decreased salivary flow as they sleep. Within a week of receiving oral prophylaxis and instruction on proper brushing technique, the patient returned for the follow-up visit with plaque buildup. This made it clear that the patient's brushing technique plays a significant role in his condition. Therefore, it is crucial to educate patients and their guardians in order to avoid such issues in the future. Plaque can be detected by utilising disclosing agents. Disclosing agents are solutions that contain dye or other colouring agents that are used to identify clearly visible bacterial plaque. They offer a useful visual aid and support the upkeep of good oral health. Most people are unaware of how much dental plaque is in their mouths or where it is located. As a result, revealing solutions must be used to identify the oral cavity's plaque-containing regions. Plaque containing bacteria is stained by a revealing chemical, which can help patients devise a successful plaque-removal strategy [12]. Fibre posts were inserted since the maxillary anterior teeth had significant carious involvement and little crown structure remained following caries treatment. Fibre posts were chosen because, in comparison to stainless steel posts, glass fibre post's biomechanical performance (stress distribution and fracture strength) is less susceptible to post diameter and post length [4].

For many people, adolescence is the time of significant caries activity. Although the rate of dental caries is generally reducing, it still peaks throughout adolescence, according to research [13]. immature enamel on permanent teeth [14], The increasing rate of caries during adolescence may also be caused by a total increase in tooth surfaces that are susceptible to decay, environmental factors like food, the ability to seek or refuse medical attention, a lack of emphasis on maintaining good oral hygiene, and further social factors [15–19]. Oral health-related quality of life (OHRQOL) has been demonstrated to be negatively impacted by missing teeth and untreated caries; however, treated teeth were not linked to lower OHRQOL [20]. In order to combat the inclined pattern of caries towards the adolescent population, dental providers should stress the benefits of professional topical fluoride therapy, regular dental check ups, patient counselling, and personal hygiene [21–23].

Adolescence is quite important period for a person's periodontal health. Periodontal disease causes irreparable tissue damage that appears to start in late adolescence or early adulthood, according to epidemiologic and immunologic studies. Gingival disease becomes common in adolescence [24, 25]. Teenagers who have dental caries, mouth breathing, crowding, and tooth eruption are more likely to develop gingivitis [24]. The increased prevalence may be due to hormonal changes that occur during adolescence [25]. Research indicates that the make up of the subgingival microflora is influenced by the increase in sex hormones during puberty, which alters the gingival response and causes exaggerated inflammation of gingiva, even when there is only a small amount of plaque present. It is thought that this inflammatory gingivitis is temporary as the body adjusts to the continuous existence of the sex hormones [24]. Other studies indicate that circulating sexual hormones have the capability to change capillary permeability and promote gingival fluid collection [26].

Conclusion

Adolescents should be taught the importance of maintaining good oral hygiene and encouraged to do so by flossing and removing plaque from their teeth on a daily basis. The frequency and method of flossing should be determined by the patient's needs and illness history. For adolescents, professional removal of calculus and plaque is strongly advised. The frequency of this intervention is chosen by the practitioner depending on the patient's evaluated risk for caries/periodontitis.

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