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Correction of anterior malocclusion related to mesiodens: A case report

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Abstract

A mesiodens is a supernumerary tooth located in the maxillary anterior region. The overall prevalence of mesiodens ranges between 0.15% and 1.9%. In such instances, malocclusion in the maxillary incisor region is a common finding, and therefore, early intervention in the mixed dentition phase will promote the eruption and proper alignment of adjacent teeth. The present case report describes how mixed dentition treatment can be efficiently and effectively managed using a Hawley's and 2x4 appliance.

Keywords: Mesiodens, mixed dentition, Hawleys's, 2x4 appliance, retention

Introduction

Hyperdontia is defined as a developmental anomaly of number characterized by the presence of an extra tooth in addition to the normal dentition. Hyperdontia may be present in both the permanent and primary dentition, with a prevalence ranging between 0.15% and 3.9%. A mesiodens is a type of supernumerary tooth located in the maxillary central incisor region. Mesiodens can erupt individually or as multiples (mesiodentes); may be impacted in a normal position or inverted. There are several theories concerning the cause of mesiodentes, however, hyperactivity of the lamina dura has been said to induce an extra tooth bud, which results in a supernumerary tooth^[1].

Complications involving the mesiodens include its interference with the eruption path and, thus, altering the position of the permanent maxillary central incisors. It can either delay or prevent the eruption, cause displacement or rotation of a central incisor^[2]. Labial displacement of the central incisor is the most common sequelae found in 82% of the cases^[3]. Therefore, extraction of the mesiodens in the early mixed dentition stage is indicated to improve the appearance by aligning the incisors and minimizing the need for extensive orthodontic treatment in the future.

Case report

A 9-year-old female patient reported with a chief complaint of an extra tooth as well as irregularly placed upper front teeth and wanted treatment for the same. Medical and family history of the patient was non-contributory, with no signs related to any syndrome. Patient gave a history of trauma to the upper front tooth due to a fall. On intraoral examination, a mesiodens of conical shape was noticed, located palatally between the maxillary central incisors (Fig. 1). Moreover, the presence of a supernumerary tooth caused labial displacement of a maxillary right central incisor, which resulted in incompetent lips and unesthetic appearance. An overjet of 6 mm with respect to the right maxillary central incisor was present, which showed Ellis class I fracture. Patient was in her mixed dentition stage with primary canines and molars. An intraoral periapical radiograph was taken to confirm the presence of a single supernumerary tooth (Fig. 2). Based on the clinical and radiographic findings, the treatment plan included extraction of mesiodens followed by orthodontic correction of malocclusion.

The following treatment plan was devised

Phase I:

1. Oral Prophylaxis
2. Extraction of Mesiodens
3. Upper and lower alginate impression for study and working model
 - **Phase II:** Hawley's appliance
 - **Phase III:** Levelling & alignment with 2x4 appliance
 - **Phase IV:** Retention

Extraction of the mesiodens was performed with local anesthesia (lidocaine 2% epinephrine 1:80.000), using the labial and palatal infiltration. The wound healing was uneventful, and the patient presented with no postoperative complications (Fig. 3). Upper and lower alginate impressions were made, and a cast was poured. A removable passive Hawley's appliance consisting of adams clasps on the molars and a 0.032" short labial bow crossing the middle third of the incisors was fabricated for the initial correction (Fig. 4). Patient was instructed to wear the appliance throughout the day and night, and remove only while eating. Early correction was achieved by activating the appliance 1.5-2 mm/week for 4 weeks, resulting in retroclination of the central incisor (Fig. 5). Furthermore, for the alignment of the incisors, the basic 2x4 appliance was given; wherein the molar tubes were bonded on both upper first permanent molars and brackets were bonded onto the erupted maxillary incisors. Additionally, a continuous 0.14 nickel titanium archwire was placed for 3 months in order to maintain a good arch form as well as control of the anterior teeth (Fig. 6). After the completion of the levelling and alignment phase, the brackets were debonded, composite build-up for the fractured right maxillary central incisor was performed (Fig. 7), and an impression was made for the fabrication of a retainer. Patient was advised a full-time wear of the retainer for the first six months, followed by night time wear for the next one year (Fig. 8).



Fig 2: Intraoral periapical radiograph showing the presence of mesiodens of conical shape parallel to the central incisors



Fig 3: Intraoral image showing healing post extraction of the mesiodens



Fig 4: Hawley's appliance after 2 weeks of activation



Fig 5: Initial correction showing positive overjet after 4 weeks of activation of the Hawley's appliance



Fig 1: Preoperative image showing the labial displacement of right central incisor due to the presence of a mesiodens



Fig 6: 2x4 appliance therapy for levelling and alignment of the incisors



Fig 7: Post operative image showing well aligned maxillary incisors



Fig 8: Retention phase

Discussion

Interceptive orthodontics play an important role in guiding the developing occlusion and thereby reducing the severity of future complex malocclusions. Early orthodontic interventions during the mixed dentition period offer a favourable growth pattern and psychological benefit to the patient^[4]. Although appliance therapy is less complicated in children, patient compliance should be taken into account as it may alter the treatment procedure and outcome. The issues associated with malalignment of incisors should be managed as soon as practically possible, as it may negatively influence the child's social interaction and self-esteem.

In the present case report, the correction of anterior malalignment was achieved with a removable Hawley's and a 2x4 appliance. Hawley's appliance is a versatile treatment option indicated for the correction of slight tooth inclinations and rotations^[5]. It is easy to fabricate and generally well tolerated by pediatric patients. In the current case, a positive overjet was attained within a span of one month. However, incorrect activation may produce deleterious changes; therefore, adequate follow-up every week is required. In addition, the appliance allows only tipping movement of teeth; hence, a fixed mechanotherapy using a 2x4 appliance was performed after the initial correction with Hawley's appliance. The 2x4 appliance reduces the need for patient cooperation and, when used correctly, provides a controlled magnitude of force and vector to tooth movement in all three dimensions with a more predictable outcome^[6].

A removable retainer was given in order to prevent relapse and maintain the incisors in their corrected position until a definite occlusion is established. However, patients should be informed that this early intervention is not always the final course of orthodontic treatment.

Conclusion

The case report demonstrated an efficient and effective alignment of incisors coupled with functional and esthetic improvements using convenient appliances like Hawley's and 2x4 appliance. The treatment objectives are achieved with a short course of treatment, and alignment is maintained with a removable retainer. Further treatment may be required in the permanent dentition; however, early treatment reduced the complexity, overall treatment time and cost of any subsequent treatment required.

Conflict of Interest

Not available

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Not available

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