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Delayed tooth eruption as a result of trauma

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Abstract

A tooth displaced down into alveolar bone is an intrusive luxation. This injury usually is accompanied by comminution of alveolar fracture.[1] The dislocation is frequently axial and radiographic examination reveals absence of periodontal space.

The primary site for luxation injuries is the maxillary anterior region in the primary and permanent dentition with frequency higher in the primary dentition.[2] The optimal treatment for intruded permanent teeth has not been determined, but Andreasen suggests the tooth should be allowed to re-erupt or be moved into position via orthodontic measures. Immediate replacement of intruded teeth into their normal position frequently is followed by resorption of the crest of the alveolar bone.[1]

An unusual case of intrusive luxation of two permanent central incisors is described in which tooth emergence into the oral cavity was delayed and some keratinized gingiva altered.

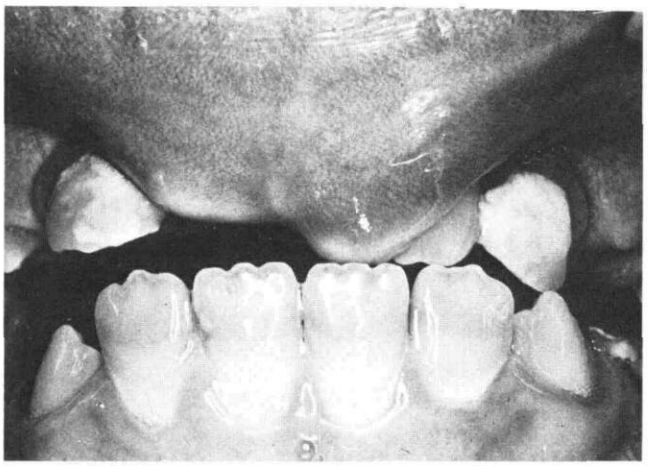

Figure 1. Note the lack of eruption of the right central incisor and partial emergence of the left central incisor. Note also the lack of fornix and the plaque accumulation on the labial surfaces of the maxillary lateral incisors.

A ten-year-old male presented with the complaint that both permanent maxillary central incisors had failed to erupt. The right central incisor crown was covered completely by an adherent elastic mucosa, and the left central incisor crown was exposed only at the distoincisal edge. The anatomical crowns of the teeth could be palpated (Figure 1). There was lack of attached gingiva adjacent to the maxillary central incisors with an absence of the anterior vestibular fornix. Oral hygiene was poor and severe gingival inflammation was present in the vestibular area adjacent to the lateral incisors. Inflammation of gingival tissue was most evident mesial to the maxillary lateral incisors where tissue folds entrapped plaque and food debris. The maxillary right lateral incisor showed an area of hypocalcification on the labial surface with subsequent demineralization due to inadequate plaque removal. A band of intrinsic strain of unknown etiology was evident on the incisal half of the four mandibular permanent incisors.

Radiographic examination revealed root dilaceration of the right permanent central incisor; root development on all other permanent teeth was normal (Figure 2). The maxillary right first permanent molar was lost prematurely due to caries and as a result the maxillary right second permanent molar erupted in mesial version. The maxillary left central incisor appeared to be erupting into a true crossbite. In addition, there was a functional anterior crossbite due to forward thrusting of the mandible. This motion avoided lacerating soft tissue covering the incisor edges of the maxillary central incisors. It appeared that there would be sufficient space available for the eruption of both maxillary incisors.

A severe traumatic injury at age two resulted in fracture and intrusion of the maxillary primary central and lateral incisors, with probable displacement of the developing maxillary right permanent central incisor. This traumatic episode may have resulted in the root dilaceration of the right permanent incisor and delayed eruption. The child sustained another trauma to the same

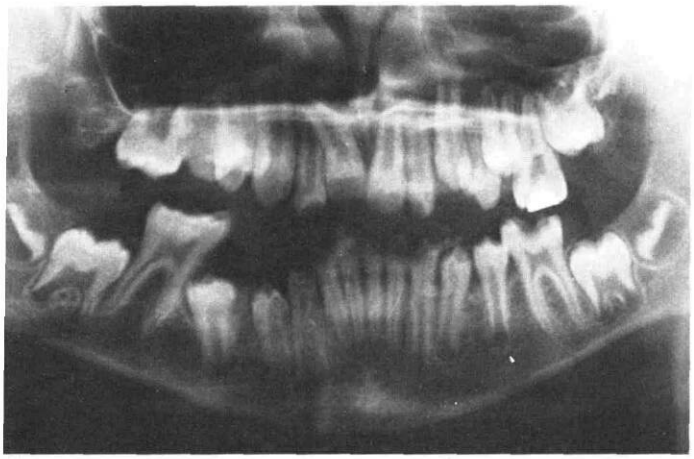

Figure 2. In this panorex radiogram showing the developing dentition, note the root dilaceration of the maxillary right central incisor. Mesial migration of the maxillary left first permanent molar is considered to be a result of premature loss of second primary molar.

Figure 4. One week postoperatively, the surgical area shows adequate healing. Note the poor oral hygiene in the mandibular incisor area.

region of the mouth at age eight in a bicycle accident, causing severe laceration of soft tissue and intrusion of both erupting permanent central incisors. The oral wound was not treated and healing may have occurred by fusion of labial and palatal fibrous connective tissue and oral epithelium. This accident may have resulted in loss of attached gingiva and delayed eruption of the permanent central incisors. The amount of gingiva may have been minimal or not present prior to the trauma and severe laceration of the labial frenum may have occurred with simultaneous intrusive luxation of the teeth resulting in the fusion of labial and palatal soft tissues.

Treatment

In order to improve the gingival health, oral hygiene instruction was given. To accelerate the eruption of the central incisors first, a conservative approach was used.

The child was instructed to occlude purposely on the soft tissue covering the incisal edges of the incisors. In addition, a snack regimen consisting of raw vegetables

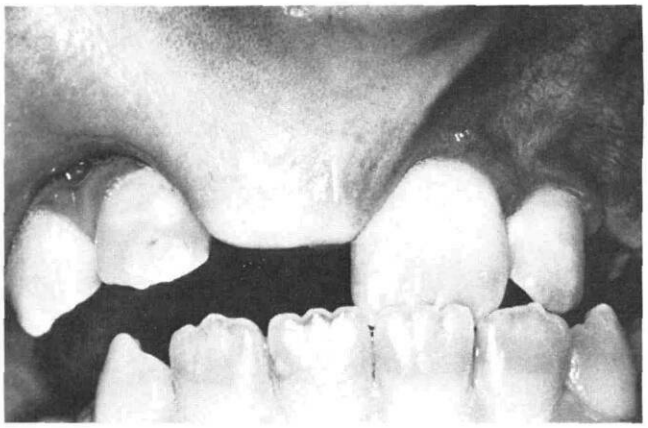

Figure 3. After four months of conservative treatment since the initial visit, the left central incisor erupted into crossbite.

Figure 5. Note the narrow band of attached gingiva and marginal gingivitis along with the full eruption of both central incisors after 18 months.

was recommended. After four months, the oral hygiene had improved greatly and the left central incisor was fully visible (Figure 3). However, the right central incisor was still covered with nonkeratinized mucosa which was associated with the maxillary frenum; the crown of the tooth was uncovered surgically. A split thickness flap operation was performed labially and the residual adherent tissue covering the anatomical crown was removed. The flap was sutured apically. A gingivectomy was performed to expose the palatal surface of the tooth. A noneugenol periodontal pack was placed for one week. On removal, the area appeared to be healing normally. Soft tissue was gently debrided with 3% hydrogen peroxide solution, and the necessity for improved oral hygiene was emphasized (Figure 4). Two weeks postoperatively healing was normal and oral hygiene had improved greatly. Eruption of the teeth was observed for 12 months.

The maxillary left central incisor erupted into crossbite. An acrylic, inclined plane appliance was constructed and seated with temporary cement on the mandibular anterior teeth. The crossbite was corrected within 3 months and the appliance removed. The central incisors were fully erupted after 18 months, and the vestibular fornix formation remained at a clinically acceptable limit. However, the amount of attached gingiva there was much less than on adjacent teeth (Figures 5 & 6).

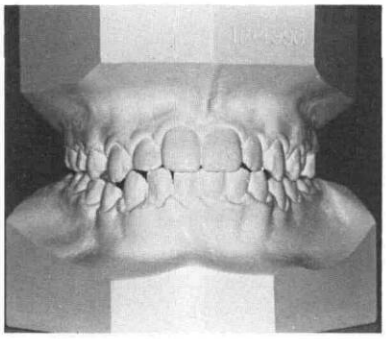

Figure 6. This postoperative study cast after 18 months shows full eruption of maxillary central incisors.

Discussion

The necessity for immediate treatment of oral trauma is emphasized by this case history. Depending on the oral hygiene of the patient, additional periodontal surgical procedures may be required in order to provide an adequate amount of attached gingiva.

Results of clinical studies have revealed that 2 mm of keratinized gingiva is required to maintain gingival health.[3] The amount of attached gingiva is usually influenced by interaction of factors such as eruption pattern of the teeth and susceptibility of tissue to plaque-induced inflammation. Therefore, it is difficult to generalize how much attached gingiva constitutes an adequate amount for optimal gingival health.

Recent clinical evidence indicates that patients can maintain gingival health with minimal or no attached gingiva.[4,5]

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Quotable Quote

One theory about dreams is that they facilitate learning and the consolidation of memories. Infants and young children reportedly experience more dream sleep than adults, and dream sleep tends to increase following learning. But it has been difficult to study the effects of dreaming on subsequent memory, because people tend to slip very quickly from dream sleep into nondream sleep.

Lawrence Scrima of Mt. Sinai Medical Center in Miami Beach has studied a group of narcoleptics — people subject to brief daytime attacks of sleep — because it is easier with narcoleptics to isolate so-called REM (rapid eye movement) sleep, during which most dreams occur, from nondream sleep. He tested the subjects on a recall task following dream sleep, nondream sleep, and wakefulness, and found that dreaming improved memory significantly more than did deep sleep. He also found that dream sleep alone had more noticeable effects on recall than did dream and nondream sleep combined, suggesting that it is not simply alertness that improves memory, but rather the consolidation and differentiation of stored information. The findings have implications for the way people schedule their sleep, Scrima said. Most dreaming is compressed into the last few hours of sleep, so that cutting sleep short — in order to study, for example — may actually interfere with learning.

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