Paediatric Dentistry: A Case of the Unerupted Maxillary Permanent Central Incisor and its Multi-Faceted Management

By Dr. Ghada Hussain, UAE & Dr. Iyad Hussein, UAE

Introduction
Monitoring the developing dentition is part and parcel of a general dentist’s (GDP) routine and this relies on the basic knowledge of tooth exfoliation and eruption times. Delayed eruption of maxillary central incisors can be a reason that parents/carers bring their child in for a dental assessment. Nevertheless, detecting this anomaly by a GDP by chance on routine examination can occur: According to Yacoob et al (2010)1 intervention for the delayed eruption of maxillary incisors, beyond the normal eruption dates, is needed in many cases. For example, if the eruption of the anterior incisor tooth occurred greater than six months previously; or if both central incisors remained unerupted and the lower incisors had erupted greater than one year previously or there is deviation from the normal sequence of eruption (e.g. lateral incisors erupting prior to the central incisor). This issue is important from the orthodontic point of view and it may have an effect on the facial aesthetics and psychology of the child, in addition to some difficulties in pronouncing some letters for example “S” which will lessen the patient’s self-esteem and social interactions.2,3 We report a case of an unerupted maxillary central incisor and its multifaceted treatment in a child patient.

Causes of the unerupted maxillary permanent central incisor
• Heredity (cleft lip and palate, cleidoocranial dysostosis, supernumerary teeth, hypodontia, ectopic tooth germ, gingival fibromatosis, tissue scar, odontome, generalised delayed eruption).
• Environmental (trauma, radiation, endocrine abnormalities).

Fig. 1: A previously taken DPT of 8 ½ year old (LT) when she was 7 showed the presence of a supernumerary tooth ($) in the maxillary midline. This was accidentally omitted at the time indicating the importance of a comprehensive report every time an x-ray is taken.

Fig. 2: An 8 ½ year old anxious girl presented with delayed eruption of 21 and a palpable palatal swelling. Lower teeth were carious; see bitewings in Figure 4

Figs. 3 (a & b): Periapical roents show the presence of an inverted conical supernumerary tooth present palatally to 21 (paradontal).

Figs. 4 (a & b): Patient LT, who was dentally anxious, also had dental caries which the above bitewings show.

Fig. 5 (a, b & c): An 8 ½ year old girl presented with delayed eruption of 21 and a palpable palatal swelling. Lower teeth were carious; see bitewings in Figure 4

Fig. 6: Periapical X-rays show the presence of an inverted conical supernumerary tooth present palatally to 21 (paradontal).

Management depends on the findings
• The incidence of unerupted maxillary central incisor (MCI) in 5-12 year old children is 0.15% and the prevalence is 2.6%.4

Investigations
When an unerupted maxillary incisor is suspected, a full set of investigations should be carried out including a medical and dental history, family history, history of dental trauma. A clinical investigation and examination should include direct palpation of the alveolus, assessing if buccal or palatal swellings are present, if a retained primary incisor is present, carrying out space analysis and dental charting. Special tests may be required like sensitivity tests but most importantly radiographs (DPT, upper anterior occlusal, periapical) to assess if the unerupted tooth is present or not, if it is malformed (e.g. dilaceration), if an obstructing feature is present (like a supernumerary or odontome) and to locate its correct position by parallax (i.e. buccal or palatal).

The postgraduate college offers residents a three year Master of Science Degree in the following six specialisations:
• Endodontics
• Oral Surgery
• Orthodontics
• Paediatric Dentistry
• Periodontology
• Prosthodontics

Advancing the future of education

The postgraduate college offers residents a three year Master of Science Degree in the following six specialisations:

Hamdan Bin Mohammed College of Dental Medicine, an institution of the Mohammed Bin Rashid Academic Medical Center, is a dental institution launched to support the community with the finest quality of dental education.

For more information on admissions, please call the Student Affairs Office at +971 4 424 8612 or visit our website at www.hbmcdm.ac.ae.

* Applies within the United Arab Emirates only.

Hamdan Bin Mohammed College of Dental Medicine
Mohammed Bin Rashid (MBRM) College of Dental Medicine
P.O. Box 505097, Dubai Healthcare City, Dubai, United Arab Emirates
www.hbmcdm.ac.ae
In lieu of the problem list, the following treatment plan was carried out:

**Phase 1**
- Dental prevention (Fissure sealants of the first permanent molars, Fluoride, diet analysis/advice and oral hygiene advice)
- Monitor the eruption of 21 for another 5 months.

**Phase 2**
- If no further eruption occurred and at the advice of the consultant orthodontist: arrange for the surgical removal of the supernumerary tooth with or without a gold chain attachment on 21 to allow extrusion of the said tooth.
- The patient was dentally anxious (could not cope with having treatment under local anaesthesia with or without inhalation sedation) and also needed restorative treatment it was decided to surgically remove the impacted supernumerary under general anaesthesia (GA) and restore the teeth at the same time (Complete Oral rehabilitation under GA).
- LT's mother consented for the aforementioned treatment to be carried out under GA. This was carried out in a GA day case setting.

The elective day case GA
The following treatment was carried out under the elective GA:

- **a) Restorative treatment**
  - Fissure sealants of the 6s
  - Pulpotomies with stainless steel crowns on 85, 84, 74, 75 and composites with fissure sealants on 55 & 65
- **b) Surgical treatment**
  - After giving local anaesthesia, a continuous palatal intracrevicular (sulcular) incision was carried out from 54 to 64 (Fig. 5)
  - Raised a mucoperiosteal flap with the nasopalatine bundle exposed and preserved (Fig. 6)
  - The palatal bone was exposed and a bulbosity was noted in the supernumerary (S) area. The overlying “egg shell” bone was removed with an osteotome.
  - The S tooth was elevated atraumatically as possible (Fig 8 a, b & c)
  - The bone was filed and irrigated with saline and tooth 21 was incisally-exposed. A decision not to place a gold chain attachment on 21 was made as 21 was not covered with bone. (Fig. 9)
  - The flap was repositioned and interrupted sutures were placed (resorbable sutures) after exposure of 21 with a small buccal apically repositioned flap (Fig. 10 a & b).
  - Extraction of loose 52, 62

Follow up post surgery
At one-week follow up, the patient was reviewed. She had no complaints. Tooth 21 had begun to erupt (Fig. 11). At one month’s follow up, tooth 21 had erupted in cross bite. Tooth 11 was already in cross bite.

**Phase 3**
- This phase included interceptive orthodontics which involved the cross bite correction of both teeth 11 & 21.
- Upper and lower alginates were taken (with difficulty due to LT's gag reflex) to fabricate an upper removable anterior segment palatal expander.

**Phase 4**
- Upper and lower alginate impressions were taken (with difficulty due to LT’s gag reflex) to fabricate an upper removable anterior segment palatal expander.
YOUR DENTURES GAVE THEM CONFIDENCE. WE’LL KEEP IT GOING.

Maintain your patients’ confidence and satisfaction with their dentures by helping them overcome daily social, emotional and physical challenges.

Help your patients eat, speak and smile with confidence with the Corega® denture care regime.

Arenco Tower, Media City, Dubai, U.A.E.
Tel: +971 4 3769556, Fax: +971 4 3769557, P.O.Box 23816
For full information about the product, please refer to the product pack.
For reporting any Adverse Events/Side Effect related to GSK product, please contact us on contactus-me@gsk.com.
Date of preparation: June 2014, CHSAU/CHPLD/0008/14b

We value your feedback
Saudi Arabia: 8008447012
All Gulf and Near East countries: +973 1650404
Help your patients eat, speak and smile with confidence with the Corega® denture care regime.

Dentures contain surface pores in which microorganisms can colonise.¹

Corega® cleanser is proven to penetrate the biofilm* and kill microorganisms within hard-to-reach surface pores.²

SEM images of denture surface.

*In vitro single species biofilm after 5 minutes soak

Fig. 12. One week post surgery. Tooth 21 had begun to erupt into a crossbite after the removal of the S. Note that 11 is already in its correct position.

Fig. 13. Upper removable orthodontic appliance with an anterior expanding palatal screw; to correct the cross bite of 11 & 21. The expansion key is on the right.

The appliance was activated using the key (seen in Fig. 15) and the patient was asked to wear the appliance for 24 hours a day (except at meal times) (Fig. 14).

When she was reviewed a month later, tooth 11 was corrected and the bite but tooth 21 was still in cross bite. It subsequently lost the appliance, so an alternative method to correct the cross bite without subjecting the patient to new impressions (due to her gag reflex) was used. We placed glass ionomer cement (GIC) on the occlusal surface of 55, 65, 75, and 85 to open the bite (Fig. 15 a & b).

This would allow for spontaneous correction of the anterior cross bite of 21 due to the positive pressure of the patient’s tongue. At two-month follow up, tooth 21 had moved but was still in cross bite. We placed a composite ramp/restoration on 51 incisally, to finalise the correction of the cross bite. One month later, tooth 21 was over the bite and in the correct anterior-posterior position (Fig. 16 a & b).

Fig. 16 (a & b). Final result. The anterior crossbite of teeth 11 and 21 had been corrected 4 months following surgery. There is a midline diastema, which is a normal phenomena at this stage and will subsequently close. The patient may need minor orthodontic appliance (with an anterior expanding screw) and posterior bite blocks to correct the anterior cross bite (Fig. 15).

Discussion
Supernumerary teeth occur in 1.5-3.5% of cases in the permanent dentition. Supernumeraries may present as tuberculate, conical, supplemental, inverted, pegged shaped or odontome shaped teeth. There is a male to female ratio approximately 2:1. They are more frequent in maxilla to mandible ratio around 5:1 and are called mesiodens in the maxillary anterior region. The effect of supernumeraries causing the failure or delayed eruption of permanent incisors was reported to be in 28% to 58% of the cases. Tuberculate supernumerary teeth are more likely to cause obstruction. In 54-78% of the cases removal of the supernumerary will result in the permanent incisor erupting spontaneously within an average of 16 months. In this case, the inverted conical supernumerary was obstructing the eruption of 21, and its removal facilitated the eruption of 21 almost immediately. Correction of anterior crossbites is of the utmost importance because they (if left untreated) may cause attrition to the labial surface of the upper incisors, fractures or mobility of incisor teeth or gingival recession. The treatment modalities adopted here fit with the best current practice UK guidelines.1-3

Conclusion
Monitoring the developing dentition may reveal anomalies that require multifaceted intervention by the paediatric dentist. The paediatric dentist skills should cover the range of restorative, interceptive orthodontic and oral surgical procedures as demonstrated in this case. GDPs must always check for delayed eruption of permanent incisors specially if one had erupted more than 6 months prior. If detected, an appropriate referral should be made to a paediatric dentist for overall management. We recommend following the Royal College of Surgeons of England (RCS(Uk)) Guidelines (2010) on management of unerupted maxillary incisors.

References
1. Management of unerupted maxillary incisors. Yaqoob O.

Fig. 14. The URA in place. Notice the posterior biteblocks opening the bite to facilitate the correction of the anterior crossbite.

Fig. 15 (a & b). GIC build ups on LT’s upper primary molars to open the bite. The effect of supernumeraries may present as tuberculate, conical, supplemental, inverted, pegged shaped or odontome shaped teeth. There is a male to female ratio approximately 2:1. They are more frequent in maxilla to mandible ratio around 5:1 and are called mesiodens in the maxillary anterior region. The effect of supernumeraries