A to Z ORTHODONTICS

Volume: 17

UNERUPTED UPPER INCISOR AND CANINE

Dr. Mohammad Khursheed Alam
BDS, PGT, PhD (Japan)
1. Causes of unerupted/ missing central incisor ............ 3
2. Investigation for unerupted/missing central incisor... 3-4
3. Treatment ................................................................ 4-6
4. Indications for maintaining and/or re-opening the space for prosthesis: ........................................... 6
5. Indications for allowing and encouraging space closure with control................................................... 6-7
6. Unerupted canine...................................................... 7
7. Causes of uneruption or delayed eruption of canine............................................................................. 7-8
8. Investigation............................................................... 8-9
9. Factors which guide treatment planning for unerupted canine ........................................................................................................ 9
10. Treatment .................................................................... 9-11
11. The prognosis and difficulty of aligning the canine. 11-12
Unerupted/ missing central incisor

Causes

One or more of the following may be responsible for missing or impaction of incisors.

(1) Partial anodontia may be associated with ectodermal dysplasia.
(2) Impaction.
(3) Supernumerary.
(4) Trauma & infection of deciduous incisors causing
   - displacement
   - dilacerations
   - destruction of tooth germ
(5) Lost early due to trauma.
(6) Retained deciduous.
(7) Eruption cyst, Odontoms etc.
(8) Traumatic intrusion
(9) Accidental removal of permanent tooth germ during removal of deciduous root.

Investigation for unerupted/missing central incisor

1. Age - central incisors normally erupt at the age of 6-8 years.
2. History of trauma or infection to deciduous anteriors.
3. History of early loss due to trauma.
4. Visual Examination of the local mucosa and inclination of adjacent teeth.
5. Palpation for any bulge of the alveolus.
6. Radiological examination by intra-oral radiographs (usually)

**Clinical**
- Observe bulge
- Palpation of labial and palatal mucosa

**Radiograph**
- To determine the presence of upper central incisor, supernumerary teeth
- Screen of developing dentition
- Periapical / Standard occlusal - crown and root morphology of unerupted \( \overline{1} \), pathology
- 2 radiographs in 2 planes /Parallax
- SLOB (same lingual opposite buccal): If tube move in the same direction – lie palatal to the arch
- Assess root of adjacent tooth
- To localize position of tooth
- Lateral ceph- to assess the dilaceration tooth

**Treatment**
- Team approach with orthodontic / paediatric dentistry/oral surgery
- Pt. main concern
- Pt compliance
• Remove any pathology

Supernumerary
• Extract supernumerary
• Sufficient space -allow eruption/ orthodontic traction
• Crowding- open space then traction

Dilaceration
• Depends on the position and crown root angle
• Severely displaced/ unfavourable position-surgical removal, replace with a prosthesis or convert 2\(\bar{1}\) into central incisor
• Favourable position – surgical exposure, bond an attachment, apply traction

Dentigerous cyst – marsupialize

Ectopic eruption of upper central – surgical removal, replace with a prosthesis or close space and convert lat incisor into central

1. If the tooth is present and of normal shape and size and in a reasonable position, the space should be maintained or reopened if necessary so that the tooth can erupt.

Tooth with fully formed root may not erupt of its own. Sometimes, surgical exposure may have to be done which may need to be followed orthodontic traction to draw the tooth in the arch.

If its eruption is prevented by supernumeraries, dentigerous cyst etc, the cause may be removed.

If it is grossly abnormal in size & shape, if dilacerated or misplaced that it will not be possible or desirable to get it in the arch or its space has closed,
then the tooth may be either removed or left alone, provided they do not cause any adverse effect on the adjacent tooth or do not hamper the orthodontic movement of any tooth.

Unless a tooth is grossly abnormal in size & shape, it can be aligned in arch and suitably crowned.

2. If the tooth is absent, lost, extracted or not possible or desirable to place it in the arch, then decision has to be made whether to maintain and reopen the space or to close the space.

In the former case, a suitable prosthesis e.g. bridge may be fitted to replace the tooth and in the later case, adjacent lateral incisor may be moved in the space and crowned to simulate missing central incisor.

If the lateral incisor is large, the other central incisor may also be trimmed to match.

**Indications for maintaining and/or re-opening the space for prosthesis:**

1. In the older patient when there is no crowding.

2. In Class III cases due to already short upper arch.

3. Where lateral incisor not considered as suitable tooth to carry the necessary crown due to its small size etc.

**Indications for allowing and encouraging space closure with control:**

1. Where extraction or loss of the tooth has occurred early in the patient who has a small arch with potential crowding elsewhere in the arch.

2. In Class II, div 1 cases, the space can be utilized to retract the remaining upper incisors
3. Where the space has already closed to such an extent that, re-opening will be difficult or time consuming.

4. Where lateral incisor is of good size to carry the necessary crown or it can be used as a central incisor by suitable trimming of the remaining central incisor.

**Unerupted canine**

A canine that is prevented from erupting into its normal functional position by bone, tooth or fibrous tissue.

The maxillary canine is most frequently misplaced tooth in the dental arch and is 2\textsuperscript{nd} only to the 3\textsuperscript{rd} molars in frequency of impaction [Thoma, 1958]

**The causes of uneruption or delayed eruption of canine may be outlined as follows:**

i. High developmental position of canine and its long path of eruption.

ii. Canine erupt late in the series and the space taken by other teeth.

iii. Early loss of deciduous teeth and crowding.

iv. Retained deciduous

v. Narrow arch and retroclination of incisors.

vi. Advanced state of development of crown at an early age.


viii. Cleft palate and lip-local disturbances may deflect canine

ix. Local pathological condition e.g. cysts, Tumors, odontoms etc.

x. Hypopitutarism eruption generally delayed.
Incidence of canine impaction: 1.5 to 2%.

6.3% of impacted canines found in mandible

No difference in incidence between right side and left side.

Incidence of bilateral canine is 17% to 25%.

Incidence of palataly misplaced canine is about 84-91% and buccally placed canine is about 9-16%.

No difference in sexes.

Investigation

Clinical assessment:

2. Palpation of the region buccally and lingualy.
3. Testing for mobility of adjacent teeth and deciduous canine.
4. Inclination of the adjacent teeth and deciduous canine, if present.
5. Position of canine in other side, if erupted.

Radiological assessment:

Radiological assessment may be done by taking some of the following radiographs, but any unnecessary exposures should be avoided.

1. Lateral skull Radiograph
2. P/A view
3. Intra-oral periapical
4. Vertex occlusal
5. Vertical paralax – upper occlusal
- periapical view

6 Horizontal paralax- 2x periapical views 20° tube shift

7 Others – - Lateral cephalogram
- CT scan

**Factors which guide treatment planning for unerupted canine**

1. Age intelligence and co-operation of the patient
2. Amount of space available in the arch for the canine
3. Presence and position of the canine, its inclination and morphology
4. The morphology and position of the adjacent teeth
5. Condition of the deciduous canine
6. Type of malocclusion
7. Tooth tissue ratio
8. Decrease inter canine width in lower labial segment

**Treatment**

Although late, canine may erupt normally without any aid. If deem necessary, any of the following treatments may be given considering the above guiding factors:

1 Exposure of the tooth and maintenance of exposure
2 Repositioning the tooth
3 Transplantation
4. Extraction or left alone

**Treatment Option**

1. No active treatment
2. Interceptive
3. Surgical exposure and orthodontic alignment
4. Surgical removal
5. Transalveolar transplant

No active treatment

- Review 6/12
- Warn and monitor for root resorption of the lateral incisor and cyst formation
- Complications:
  - Resorption of adjacent teeth
  - Pathological changes
  - Poor aesthetics

Interceptive

- Extract upper primary canine in uncrowded mouth at the age of 10-13yrs to allow the impacted 3 to normalize
- 78% of palatal canine improve within 1 year
- Assess the position of the 3 and consider the occlusion as a whole
- Increased overlap with 2 reduce the chance of normalizing.
- Should consult the orthodontist
Surgical exposure and orthodontic alignment

- Where interceptive fail or unsuitable
- Space should be available for canine to erupt, in crowded arch extraction of 4 may be required
- Surgically expose the 3 and bond bracket with/without chain
- Complication:
  - Root resorption of teeth adjacent to the canine
  - Ankylosis of canine
  - Pulpal obliteration
  - Unable to complete tx due to ↑tx time

Surgical removal

- Severely displaced canine with limited pt compliance
- Uncrowded arch - extract 3 and leave c to preserve he alveolar bone, may need prosthesis e.g implant

Transalveolar transplant

- Where interceptive failed and the canine position is unfavourable
- Ideally at 13-14 yrs of age with open apex
- Possible complication- ankylosis and submergence
- Require good team, experienced oral maxillo-facial surgeon

The prognosis and difficulty of aligning the canine are influence by:

- Horizontal position, high mean extended tx time
- Palatal or buccal
- inclination of the canine, mesio-angular or horizontal
- Position of the crown in relation to the root of the lateral incisor
Bibliography:

4. Iida J. Lecture/class notes. Professor and chairman, Dept. of Orthodontics, School of dental science, Hokkaido University, Japan.
5. Lamiya C. Lecture/class notes. Ex Associate Professor and chairman, Dept. of Orthodontics, Sapporo Dental College.
17. Yoshiaki S. Lecture/class notes. Associate Professor and chairman, Dept. of Orthodontics, School of dental science, Hokkaido University, Japan.
Dedicated To

My Mom, Zubaida Shaheen
My Dad, Md. Islam
&
My Only Son
Mohammad Sharjil
Acknowledgments

I wish to acknowledge the expertise and efforts of the various teachers for their help and inspiration:

1. Prof. Iida Junichiro – Chairman, Dept. of Orthodontics, Hokkaido University, Japan.
3. Asst. Prof. Kajii Takashi – Dept. of Orthodontics, Hokkaido University, Japan.
8. Prof. Amirul Islam – Principal, Bangladesh Dental college
9. Prof. Emadul Haq – Principal City Dental college
11. Asso. Prof. Lamiya Chowdhury – Chairman, Dept. of Orthodontics, Sapporo Dental College, Dhaka.
12. Late Prof. Begum Rokeya – Dhaka Dental College.
13. Asso. Prof. MA Sikder – Chairman, Dept. of Orthodontics, University Dental College, Dhaka.
Dr. Mohammad Khursheed Alam
has obtained his PhD degree in Orthodontics from Japan in 2008. He worked as Asst. Professor and Head, Orthodontics department, Bangladesh Dental College for 3 years. At the same time he worked as consultant Orthodontist in the Dental office named “Sapporo Dental square”. Since then he has worked in several international projects in the field of Orthodontics. He is the author of more than 50 articles published in reputed journals. He is now working as Senior lecturer in Orthodontic unit, School of Dental Science, Universiti Sains Malaysia.

Volume of this Book has been reviewed by:

Dr. Kathiravan Purmal
BDS (Malaya), DGDP (UK), MFDSRCS (London), MOrth (Malaya), MOrth RCS( Edin), FRACPS.
School of Dental Science, Universiti Sains Malaysia.

Dr Kathiravan Purmal graduated from University Malaya 1993. He has been in private practice for almost 20 years. He is the first locally trained orthodontist in Malaysia with international qualification. He has undergone extensive training in the field of oral and maxillofacial surgery and general dentistry.