

Learning objectives

- ▶ Generals of primary dentition
- ▶ Anatomy of primary dentition
- ▶ Anatomy of permanent dentition
- ▶ A review of maxillofacial bones anatomy

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Primary dentition

- ▶ Primary teeth emerge in children between the age of 6 months and 2 years
- ▶ 20 primary teeth
 - 8 molars , 4 canines and 8 incisors
- ▶ Beginning at age 6 theses teeth are gradually replaced by the permanent teeth



Primary dentition functions

- ▶ Primary teeth are often called deciduous teeth
- ▶ Hold an important role in the reserving space for permanent teeth
- ▶ formulation of clear speech
- ▶ Maintenance of space and arch continuity(
except for incisors)



General characteristics of primary teeth

- ▶ Primary teeth are smaller in size than permanent teeth
- ▶ They are whiter in color
- ▶ They are less mineralized than permanent teeth



General characteristics of primary teeth

- ▶ They have shorter crowns with respect to their roots
- ▶ The layers of enamel and dentin are thinner than on permanent teeth
- ▶ Primary teeth exhibit fewer anomalies

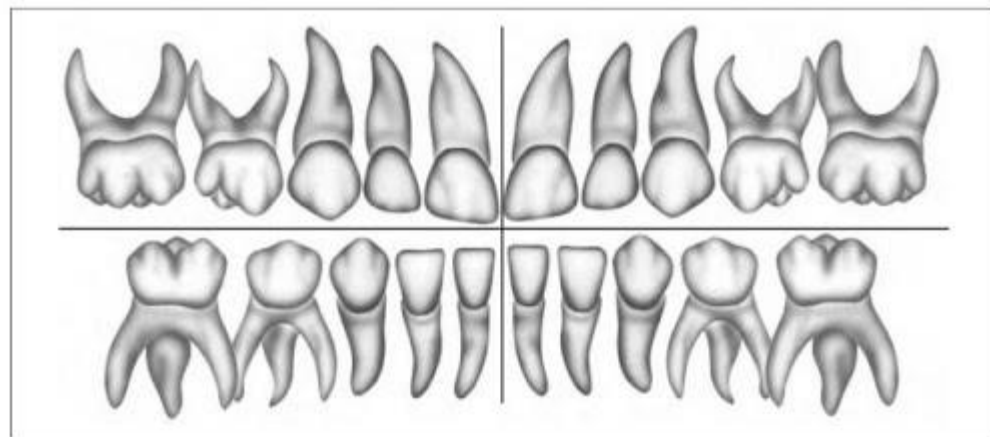
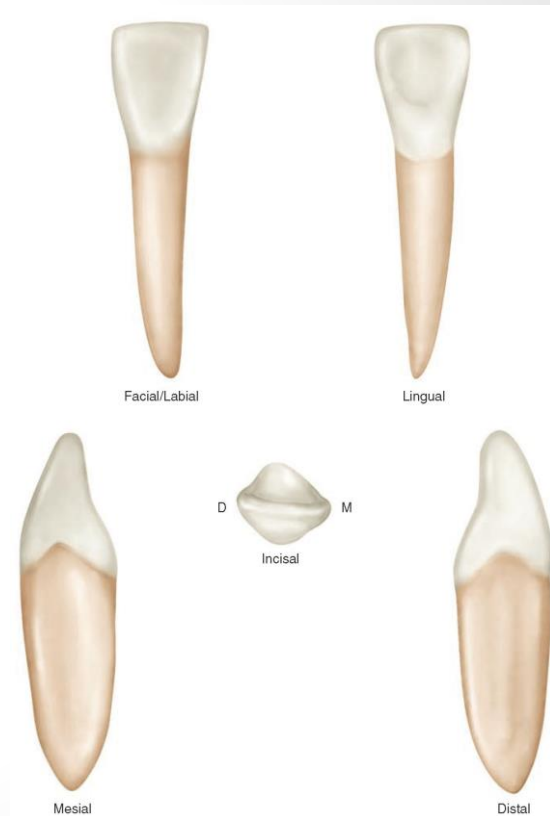


Fig 4-62 The vestibular view of the primary teeth shows their basic compact shape. The roots of the primary molars are flared; the tooth germs of the succeeding teeth lie between them.

Primary anterior anatomy

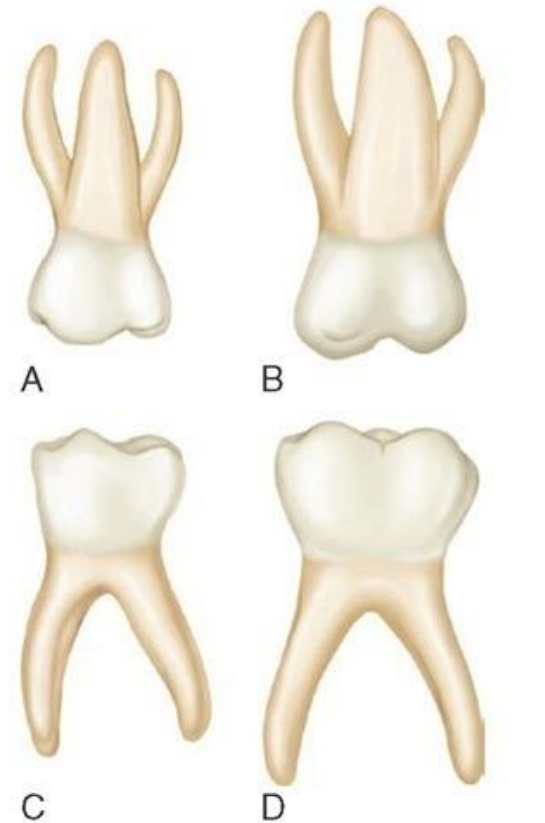
General characteristics of the anterior teeth

- ▶ Usually no depression on the labial surface of the crowns of incisor
- ▶ There are no mamelons on the incisal edges
- ▶ The roots are long in proportion to the crown length, and narrow mesiodistally



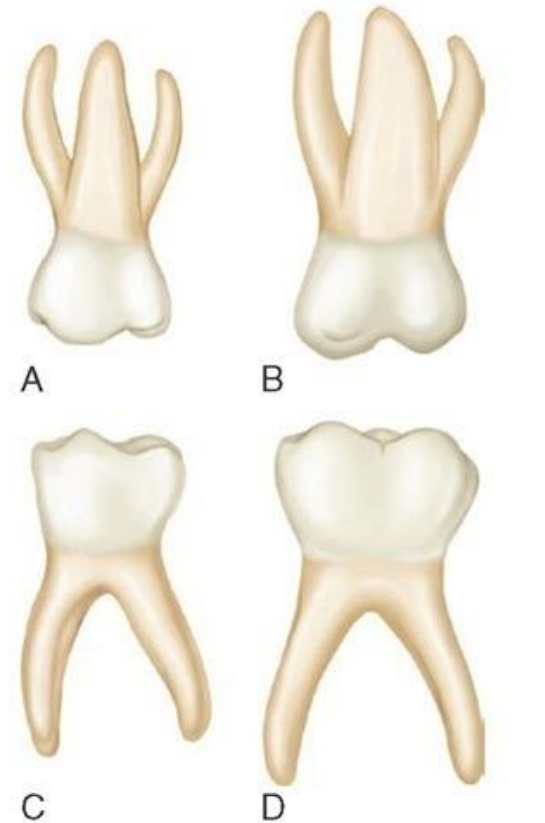
Primary posterior dentition

- ▶ The molar crowns are wider mesiodistally, yet shorter cervico-occlusally
- ▶ The second molars are much larger than the first molars
- ▶ The molar crowns have a narrow chewing surface



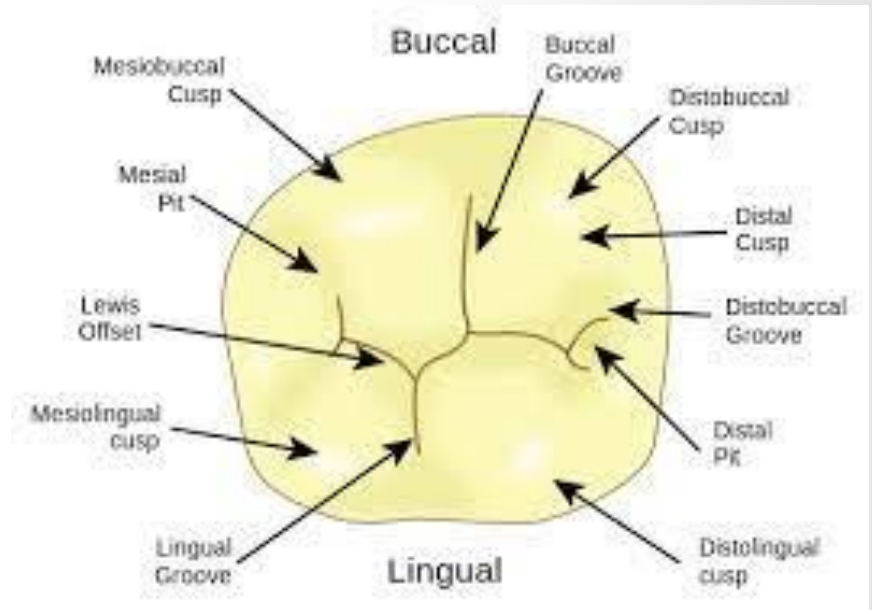
Primary posterior dentition

- ▶ The roots are widely spread beyond the outlines of the crown
- ▶ The roots are thin and slender
- ▶ The second molar roots are spread widely than the first molar roots



Primary mandibular first molars

- ▶ Primary first molars are smaller than primary second molars
- ▶ They are **quite unique** in their shape
- ▶ (resemble no other tooth in either permanent or primary dentition)



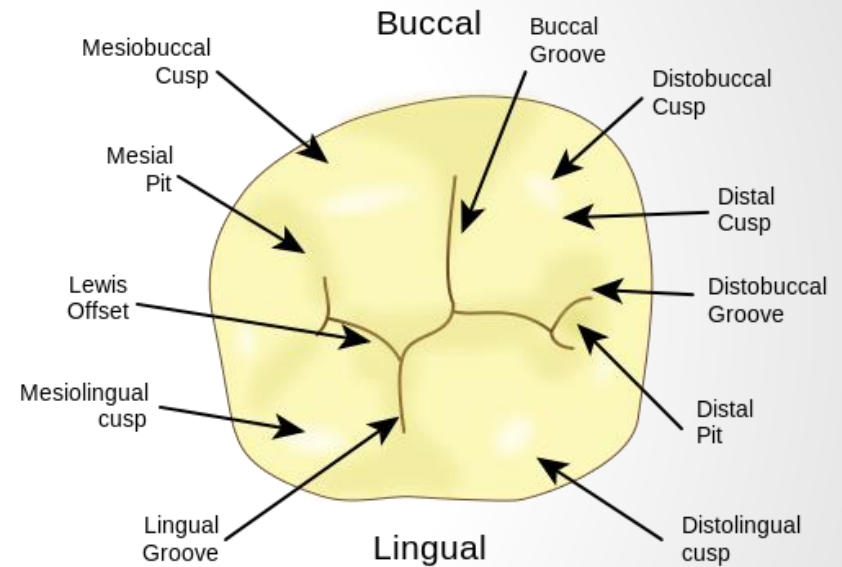
Primary mandibular first molars

- ▶ Two roots:
 - mesial and distal with the mesial wider and longer than the distal



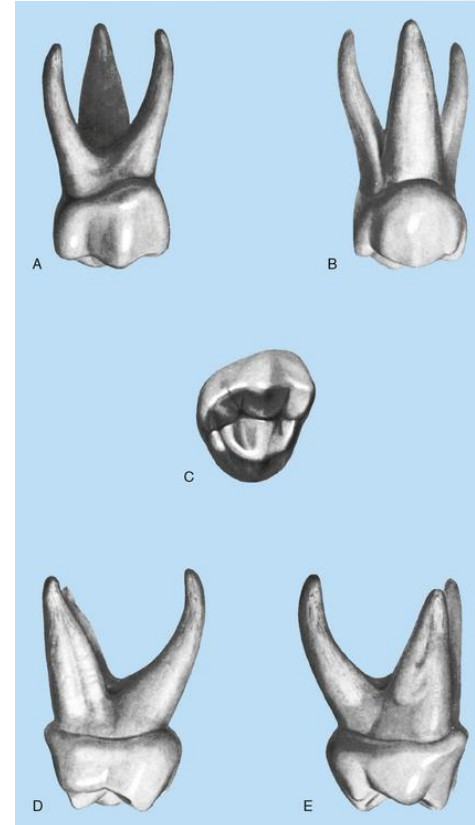
Primary mandibular second molars

- ▶ resembles the mandibular first permanent molar(except that their buccal cusps size is the same as each other)



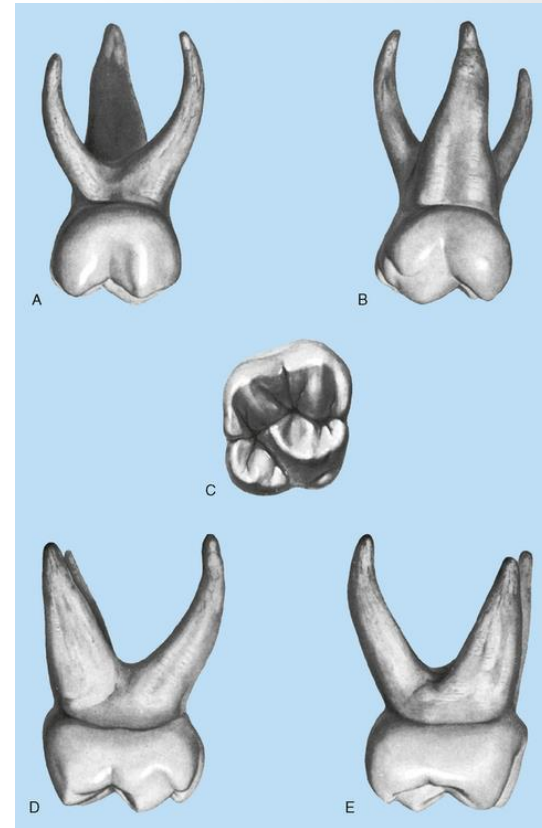
Primary maxillary first molars

- ▶ Resemble a permanent premolar
- ▶ Usually 3 roots
- ▶ The mesiobuccally root is broad



Primary maxillary second molars

- ▶ They bear Very close resemblance to **maxillary first permanent tooth**
- ▶ Most of them are 3-rooted



Permanent teeth anatomy



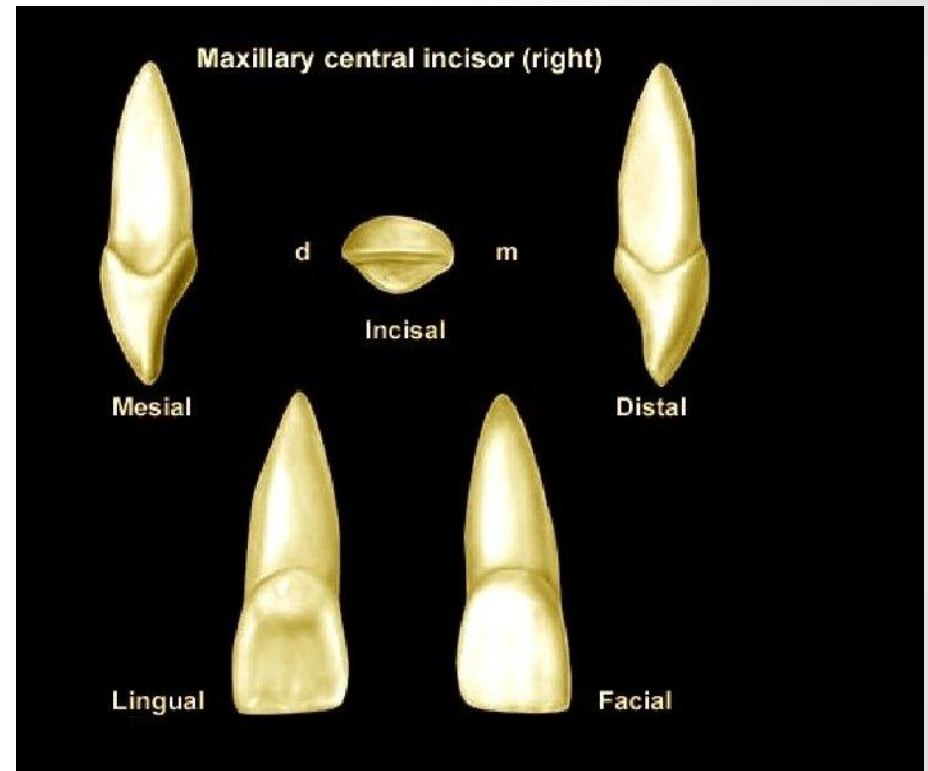
Maxillary permanent incisors

- ▶ 4 maxillary and 4 mandibular incisors
- ▶ The upper central incisors are the most broadest teeth of the anteriors.



Maxillary permanent central incisors

- ▶ The surface is smoothly, convex and flattened incisally.
- ▶ Single root (cone shape)
- ▶ Facial surface larger than lingual surface.



Maxillary permanent central incisors

- ▶ Cingulum(1 / 3 cervical)
- ▶ Lingual fossa
- ▶ Wide pulp chamber
- ▶ 3 pulp horns



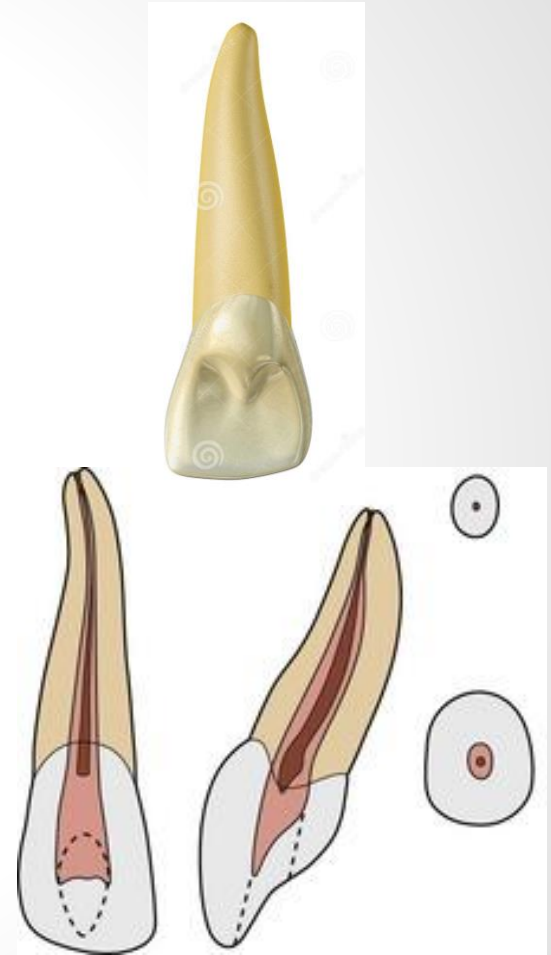
Maxillary permanent lateral incisors

- ▶ The surface is more convex than the central incisors
- ▶ Cervical ridge(cervical third)
- ▶ Single root



Maxillary permanent lateral incisors

- ▶ The cingulum(1 / 3 cervical
- ▶ Lingual fossa
- ▶ Lingual pit
- ▶ Wide pulp chamber
- ▶ Does not have three pulp horns



Malformation of upper permanent lateral

Peg-shaped



Missing



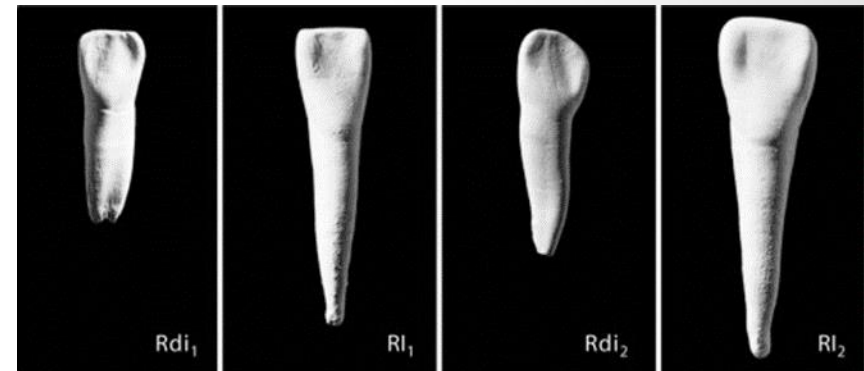
Mandibular permanent central incisors

- ▶ The surface is convex both mesiodistally and incisocervically
- ▶ Single root
- ▶ Cervical ridge



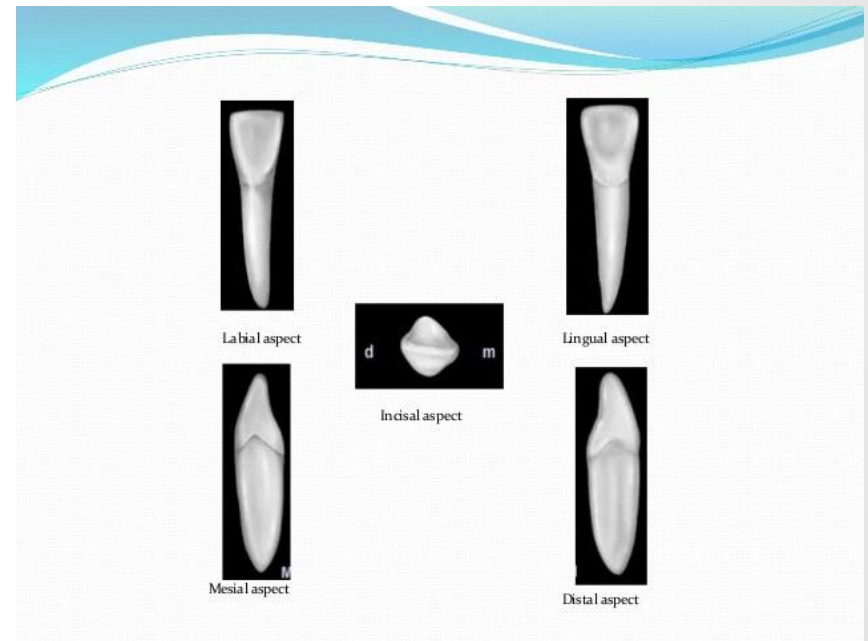
Mandibular permanent central incisors

- ▶ Lingual surface narrower than the labial surface
- ▶ Cingulum
- ▶ Lingual fossa
- ▶ All elevations and depressions are poorly developed



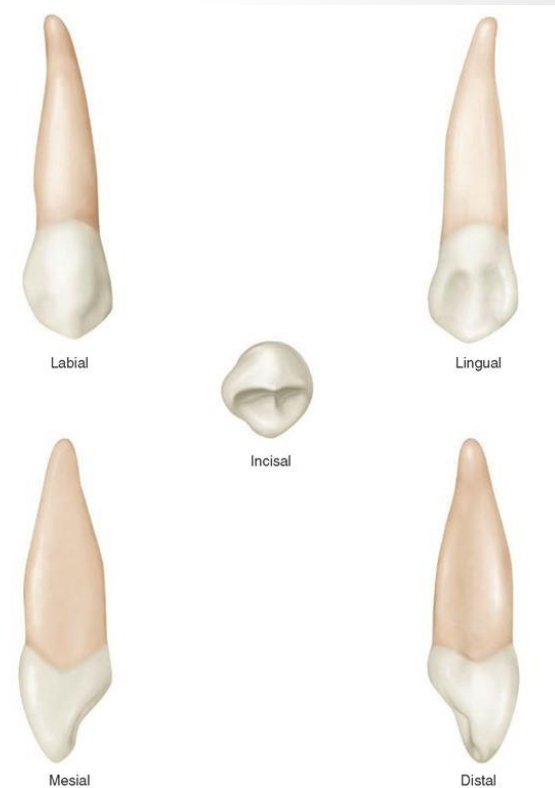
Mandibular permanent lateral incisors

- ▶ Larger than central
- ▶ Single root
- ▶ The root is longer than central
- ▶ Cingulum deviated distal



Permanent maxillary canines

- ▶ **Corner stones**
- ▶ long roots
- ▶ Convex surface both mesiodistally and inciso – cervically



Permanent mandibular canines

- ▶ The mesial half of the crown resembles the upper lateral incisor and the distal half resemble a premolar
- ▶ Convex surface
- ▶ Long and slender root



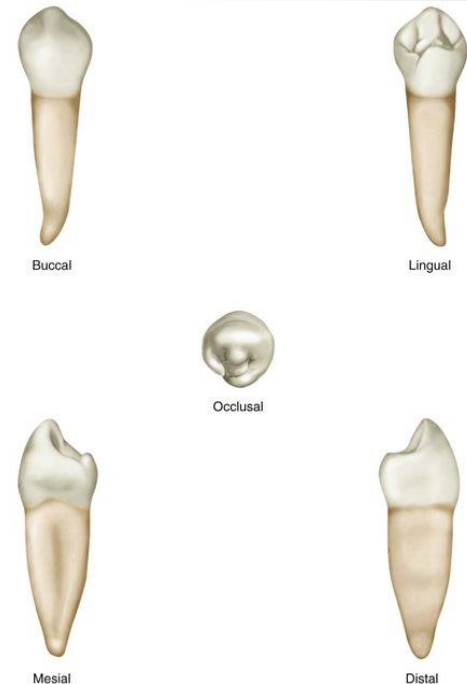
Maxillary premolars

- ▶ First and second maxillary premolars bear a very close resemblance to each other
- ▶ The crown is shorter than anterior teeth
- ▶ 1st premolar has 2 roots
- ▶ 2nd premolar Mostly has one root
- ▶ Missing in second maxillary premolar is very common



Mandibular premolars

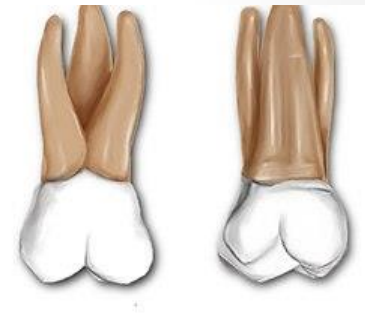
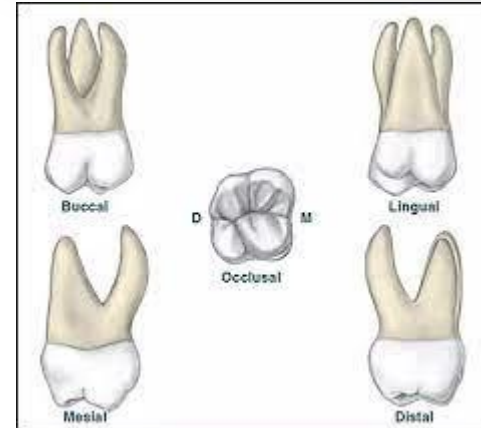
- ▶ 4 lobes(3 buccal and 1 lingual)
- ▶ The root is cone shape and shorter than canine



Permanent molars

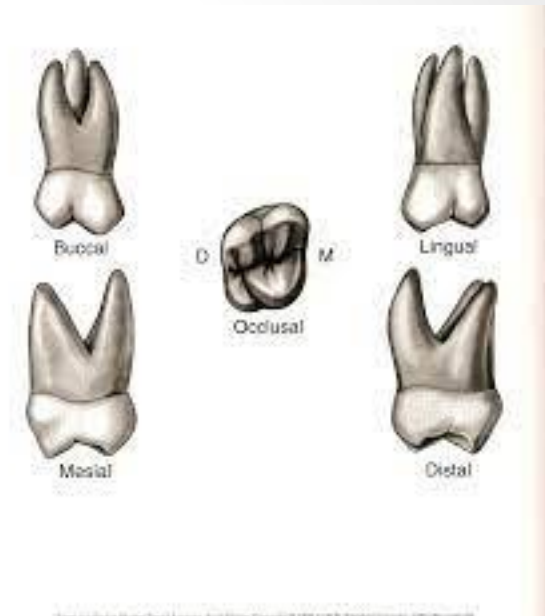
Maxillary permanent 1st molars

- ▶ 4 lobes(2 buccal and 2 lingual)
- ▶ 3 roots (2 buccal and 1 palatal)
- ▶ Similar to second primary molar
- ▶ Carabelli cusp



Maxillary permanent 2nd molars

- ▶ 4 lobes
- ▶ 3 roots
- ▶ The crown is similar to 1st molar but shorter
- ▶ No carabelli cusp



Maxillary permanent 3rd molars

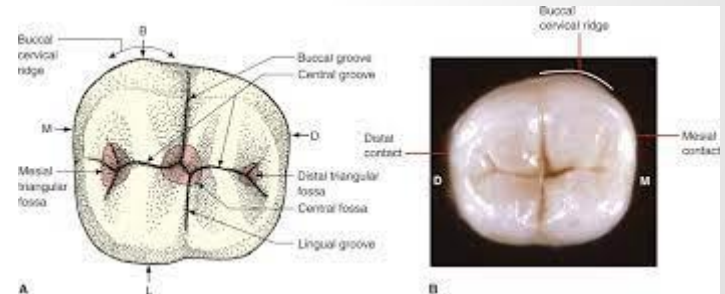
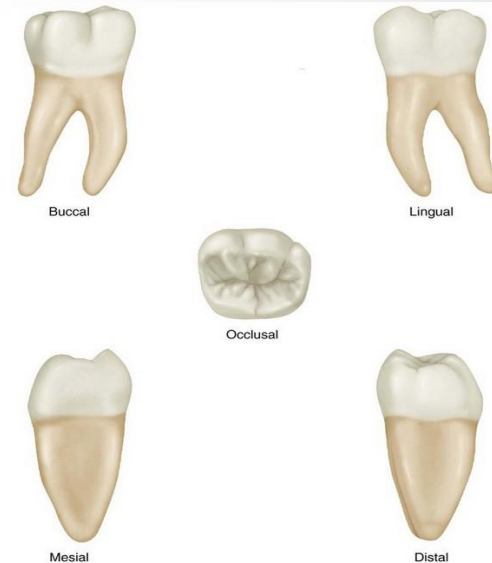
- ▶ 4 lobes
- ▶ The last tooth in the dental arch
- ▶ 3 roots
- ▶ no standard form observed for this tooth(hard to describe it)



Figure 11 – Maxillary third molar with three roots

Mandibular permanent molars

- ▶ 1st molars
 - 5 lobes(2 buccal, 1 distal and 2 lingual)
 - 2 roots
- ▶ 2nd molars:
 - 4 lobes
 - 2 roots that are smaller and shorter



Mandibular 3rd molars

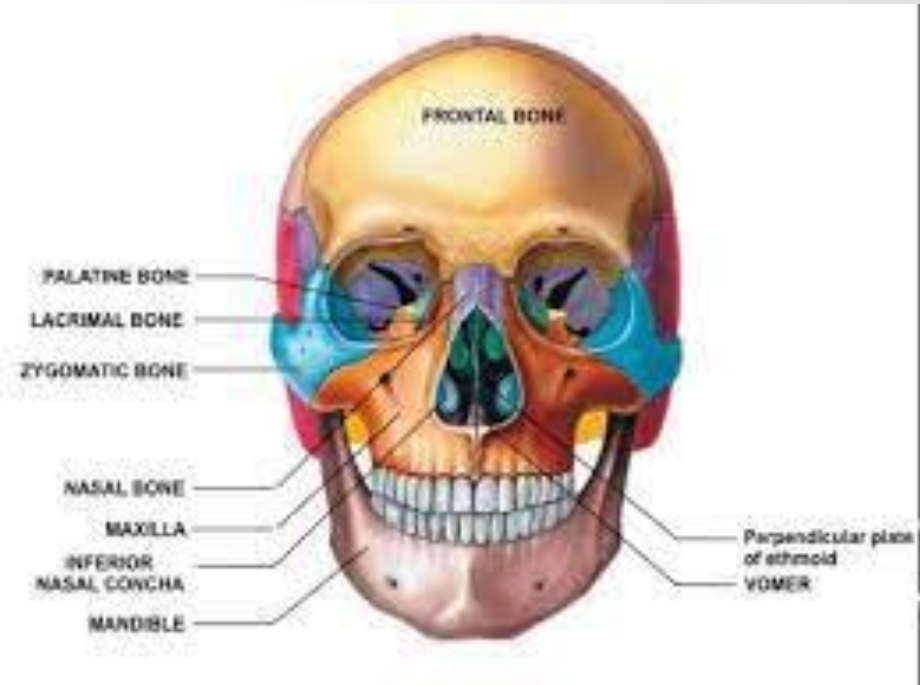
- ▶ 4 lobes
- ▶ Last tooth
- ▶ Resembles the permanent mandibular 2nd molar
- ▶ 2 roots
- ▶ Permanent molar teeth replace no primary teeth



Facial skeletons

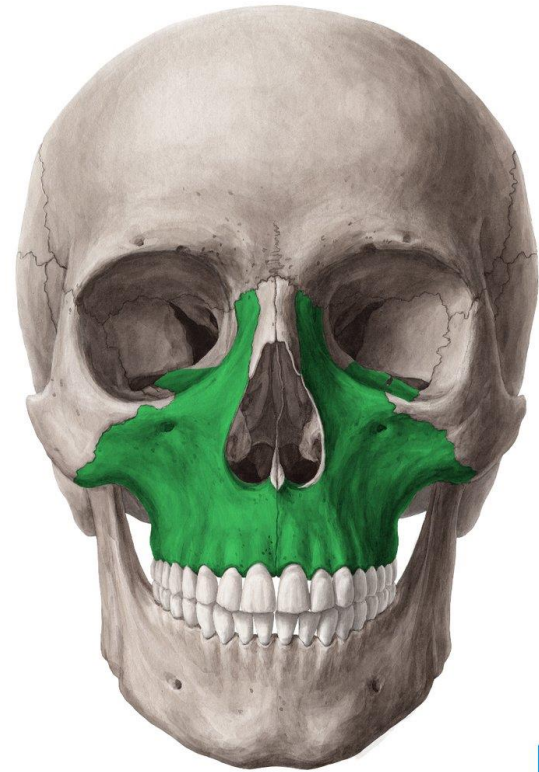
► Face: consists of these bones:

- Maxilla
- Zygomatic bones
- Lacrimal bones
- Nasal bones
- Vomer
- Mandible



Maxilla bone

- ▶ 2 maxillae form whole of upper jaw
- ▶ Each maxilla contributes:
 - Face
 - Nose
 - Mouth
 - orbit infratemporal fossa
 - pterygopalatine fossa

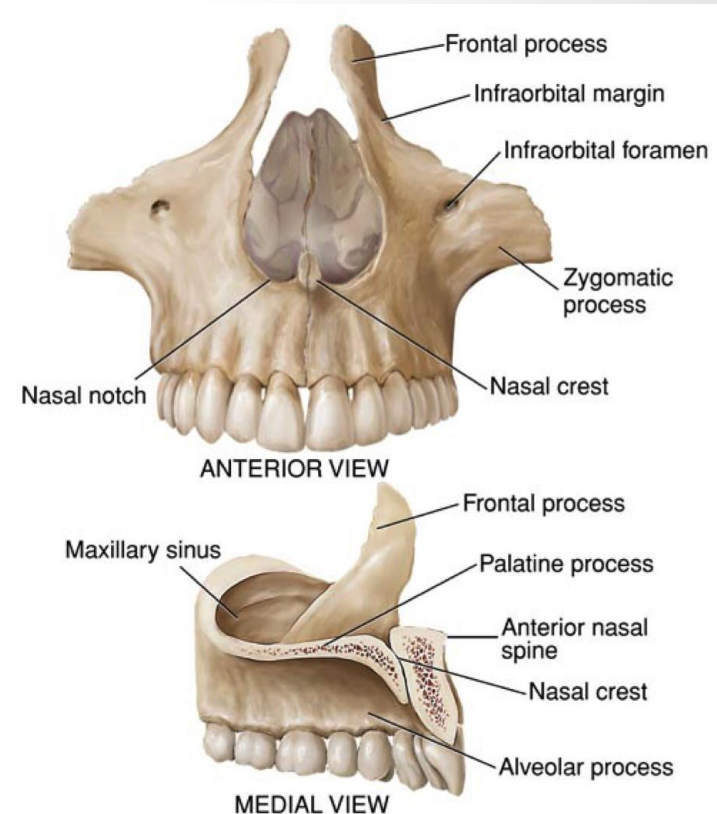


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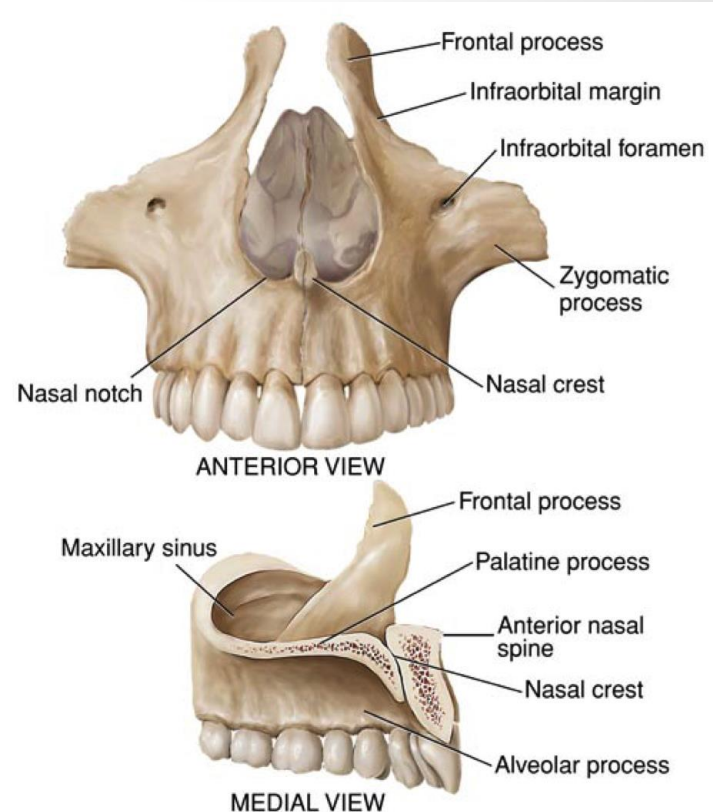
Maxilla bone

- ▶ Each maxilla has:
- ▶ a body
- ▶ 4 processes
 - Frontal
 - Zygomatic
 - Alveolar
 - palatin

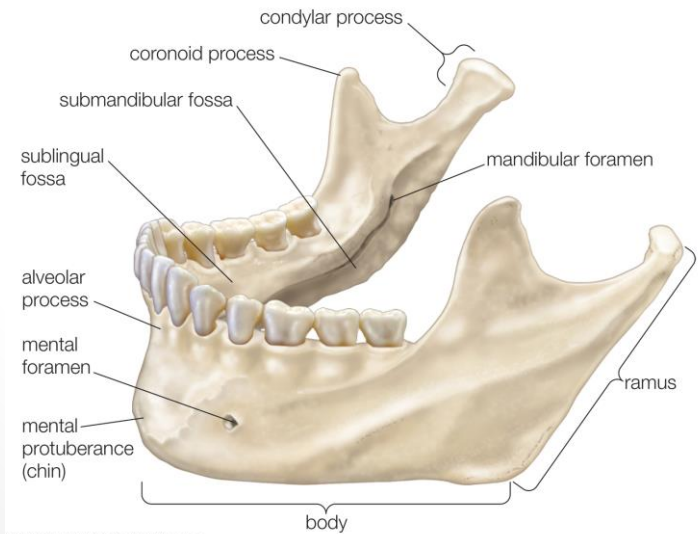


Maxilla bone

- ▶ Body (Pyramidal shape):
- ▶ Base: medially at nasal surface
- ▶ Apex: laterally at zygomatic process
- ▶ 4 surfaces ;
 - Anterior/infratemporal
 - Medial /nasal
 - Superior/orbital
- ▶ Encloses maxillary sinus



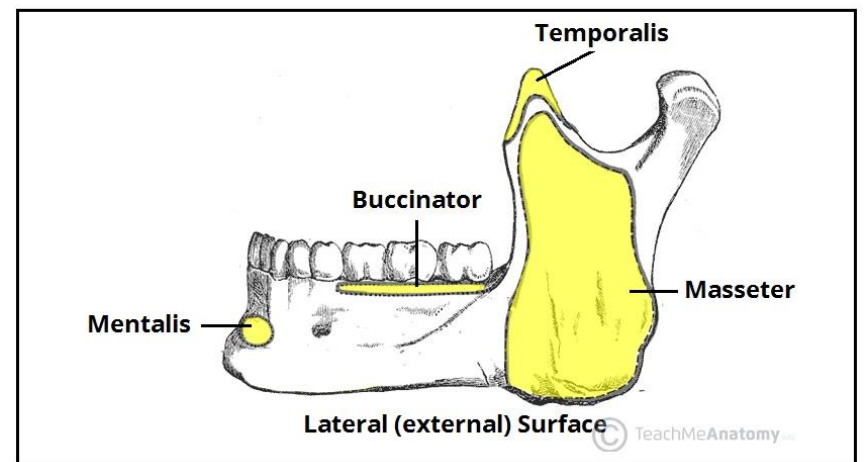
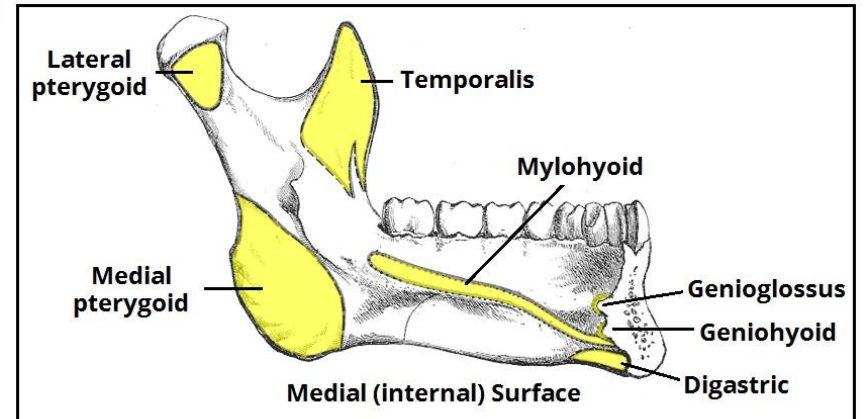
mandible



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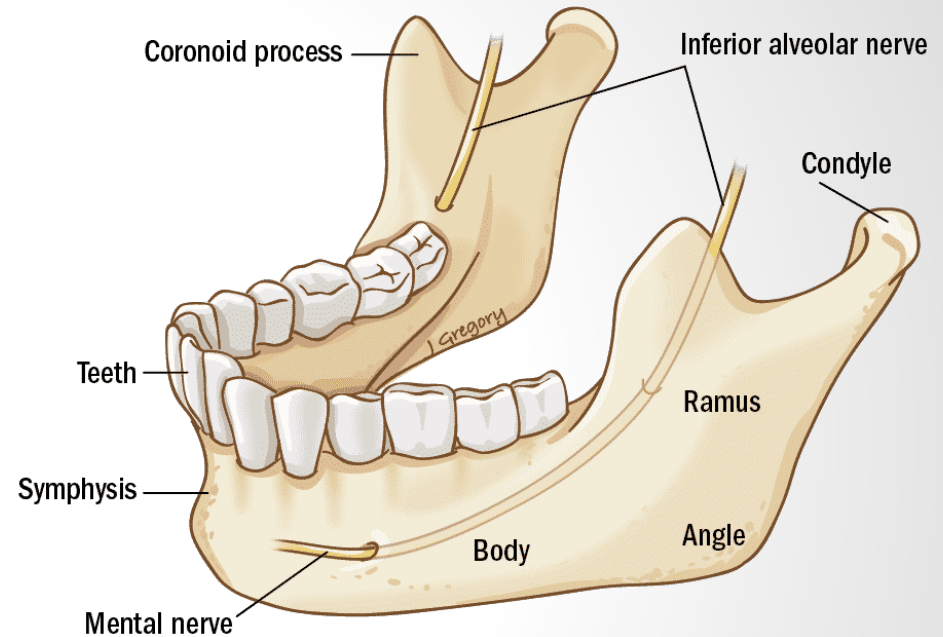
Mandible bone

- ▶ The body:
- ▶ Horseshoe-shaped
- ▶ 2 surfaces:
 - External
 - internal
- ▶ 2 borders
 - Upper
 - lower



Mandible bone

- ▶ The upper border contains 16 alveoli for the roots of the teeth
- ▶ The ramus:
 - coronoid process
 - Condylod process



Injuries to the primary dentition



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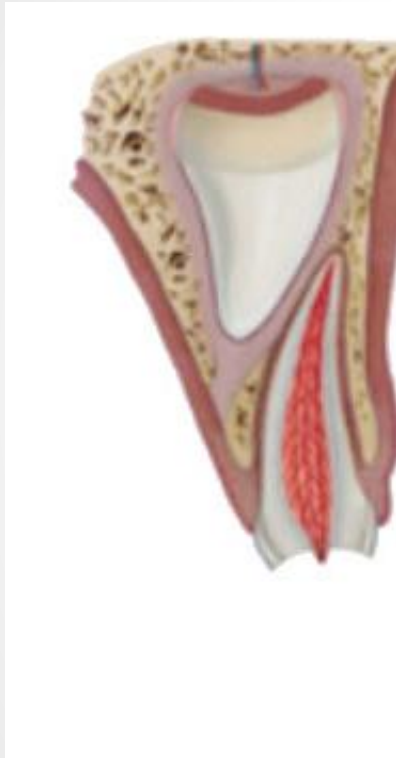
Traumatic injuries to the
teeth (J.O.andrease)

Introduction

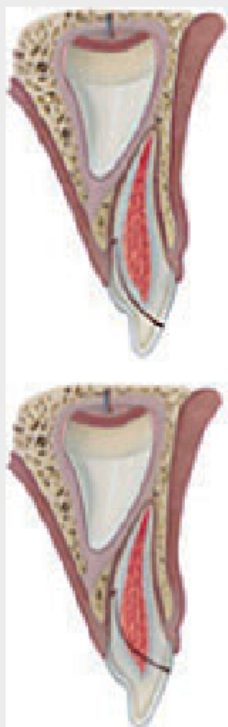
- ▶ Trauma to oral region comprise of 5% of all injuries
- ▶ Common in 2–4 years old children
- ▶ difficult to examine and treat
- ▶ Of oral injuries dental injuries are the most frequent
- ▶ Consequences after primary teeth injury:
 - tooth malformation
 - Impacted teeth
 - Eruption disturbance
 - Enamel hypoplasia is the most common sequel after intrusion and avulsion

				Follow-up procedures for fractures of teeth and alveolar bone	Favorable and Unfavorable outcomes include some, but not necessarily all, of the following	
	Clinical findings	Radiographic findings	Treatment		Favorable Outcome	Unfavorable Outcome
Enamel fracture	 <ul style="list-style-type: none"> ● Fracture involves enamel 	<ul style="list-style-type: none"> ● No radiographic abnormalities 	<ul style="list-style-type: none"> ● Smooth sharp edges 			
Enamel dentin fracture	 <ul style="list-style-type: none"> ● Fracture involves enamel and dentin; the pulp is not exposed 	<ul style="list-style-type: none"> ● No radiographic abnormalities. The relation between the fracture and the pulp chamber will be disclosed 	<p>If possible, seal completely the involved dentin with glass ionomer to prevent microleakage. In case of large lost tooth structure, the tooth can be restored with composite</p>	3–4 weeks C		

Complicated crown fracture



- ▶ Pulp preservation is necessary
- ▶ Follow up: 1 week c, 6–8 weeks C+R and 1 year C+R



Root fracture

			Follow-up procedures for fractures of teeth and alveolar bone	Favorable and Unfavorable outcomes include some, but not necessarily all, of the following	
Clinical findings	Radiographic findings	Treatment		Favorable Outcome	Unfavorable Outcome
<ul style="list-style-type: none"> ● Fracture involves enamel, dentin, and root structure; the pulp may or may not be exposed ● Additional findings may include loose, but still attached, fragments of the tooth ● There is minimal to moderate tooth displacement 	<ul style="list-style-type: none"> ● In laterally positioned fractures, the extent in relation to the gingival margin can be seen ● One exposure is necessary to disclose multiple fragments 	<p>Depending on the clinical findings, two treatment scenarios may be considered:</p> <ul style="list-style-type: none"> ● Fragment removal only if the fracture involves only a small part of the root and the stable fragment is large enough to allow coronal restoration ● Extraction in all other instances 	<p>In cases of fragment, removal only:</p> <p>1 week C 6–8 weeks C+R 1 year C(*)</p>	<ul style="list-style-type: none"> ● Asymptomatic; continuing root development in immature teeth 	<ul style="list-style-type: none"> ● Symptomatic; signs of apical periodontitis; no continuing root development in immature teeth

Root fracture





- | | | | | | |
|---|---|--|---|---|-------------|
| <ul style="list-style-type: none"> • The coronal fragment may be mobile and may be displaced | <ul style="list-style-type: none"> • The fracture is usually located mid-root or in the apical third | <ul style="list-style-type: none"> • If the coronal fragment is not displaced, no treatment is required • If the coronal fragment is displaced, repositioning and splinting might be considered. Otherwise extract only that fragment. The apical fragment should be left to be resorbed | <ul style="list-style-type: none"> • No displacement: 1 week C, 6–8 weeks C, 1 year C+R and C(*) each subsequent year until exfoliation • Extraction 1 year C+R and C(*) each subsequent year until exfoliation | <ul style="list-style-type: none"> • Signs of repair between fractured segments • Continuous resorption of the left apical fragment | <p>None</p> |
|---|---|--|---|---|-------------|

Alveolar fracture



- | | | | | | |
|---|--|--|--|--|--|
| <ul style="list-style-type: none"> • The fracture involves the alveolar bone and may extend to adjacent bone • Segment mobility and dislocation are common findings • Occlusal interference is often noted | <ul style="list-style-type: none"> • The horizontal fracture line to the apices of the primary teeth and their permanent successors will be disclosed • A lateral radiograph may also give information about the relation between the two dentitions and if the segment is displaced in labial direction | <ul style="list-style-type: none"> • Reposition any displaced segment and then splint • General anesthesia is often indicated • Stabilize the segment for 4 weeks • Monitor teeth in fracture line | <p>1 week C
3–4 weeks S+C +R
6–8 weeks C +R
1 year C+R and C(*) each subsequent year until exfoliation</p> | <ul style="list-style-type: none"> • Normal occlusion • No signs of apical periodontitis • No signs of disturbances in the permanent successors | <ul style="list-style-type: none"> • Signs of apical periodontitis or external inflammatory root resorption of primary teeth • Signs of disturbances in the permanent successors require follow up until full eruption |
|---|--|--|--|--|--|

	Clinical findings	Radiographic findings	Treatments	Follow up	Favorable and Unfavorable outcomes include some, but not necessarily all, of the following	
					Favorable Outcome	Unfavorable Outcome
Concussion 	<ul style="list-style-type: none"> The tooth is tender to touch. It has normal mobility and no sulcular bleeding 	<p>No radiographic abnormalities. Normal periodontal space</p>	<ul style="list-style-type: none"> No treatment is needed. Observation 	<p>1 week C 6–8 weeks C</p>	<ul style="list-style-type: none"> Continuing root development in immature teeth 	<ul style="list-style-type: none"> No continuing root development in immature teeth Dark discoloration of crown. No treatment is needed unless apical periodontitis develops
Subluxation 	<ul style="list-style-type: none"> The tooth has increased mobility but has not been displaced Bleeding from gingival crevice may be noted 	<p>Radiographic abnormalities are usually not found Normal periodontal space An occlusal exposure is recommended to screen for possible signs of displacement or the presence of a root fracture. The radiograph can furthermore be used as a reference point in case of future complications</p>	<ul style="list-style-type: none"> No treatment is needed. Observation. Brushing with a soft brush and use of alcohol-free 0.12% chlorhexidine topically on the affected area with cotton swabs twice a day for 1 week 	<p>1 week C 6–8 weeks C Crown discoloration might occur. No treatment is needed unless a fistula develops Dark discolored teeth should be followed carefully to detect sign of infection as soon as possible</p>	<ul style="list-style-type: none"> Continuing root development in immature teeth Transient red/gray discoloration A yellow discoloration indicates pulp obliteration and has a good prognosis 	<ul style="list-style-type: none"> No continuing root development in immature teeth Dark discoloration of crown No treatment is needed unless apical periodontitis develops

Extrusive luxation



- Partial displacement of the tooth out of its socket
- The tooth appears elongated and can be excessively mobile

Future complications

Increased periodontal ligament space apically

- Treatment decisions are based on the degree of displacement, mobility, root formation, and the ability of the child to cope with the emergency situation
- For minor extrusion (<3 mm) in an immature developing tooth, careful repositioning or leaving the tooth for spontaneous alignment can be treatment options
Extraction is the treatment of choice for severe extrusion in a fully formed primary tooth

1 week C
6–8 weeks C +R
6 months C+R
1 year C+R
Discoloration might occur
Dark discolored teeth should be followed carefully to detect sign of infection as soon as possible

- Continuing root development in immature teeth
- Transient red/gray discoloration
A yellow discoloration indicates pulp obliteration and has a good prognosis

- No continuing root development in immature teeth
- Dark discoloration of crown
No treatment is needed unless apical periodontitis develops

Lateral luxation

Lateral luxation



- The tooth is displaced, usually in a palatal/lingual, or labial direction
- It will be immobile

Increased periodontal ligament space apically is best seen on the occlusal exposure. And an occlusal exposure can sometimes also show the position of the displaced tooth and its relation to the permanent successor

- If there is no occlusal interference, as is often the case in anterior open bite, the tooth is allowed to reposition spontaneously
- In case of minor occlusal interference, slight grinding is indicated
- When there is more severe occlusal interference, the tooth can be gently repositioned by combined labial and palatal pressure after the use of local anesthesia
- In severe displacement, when the crown is dislocated in a labial direction, extraction is the treatment of choice

1 week C
2–3 weeks C
6–8 weeks C
+R
1 year C+R

- Asymptomatic
- Clinical and radiographic signs of normal or healed periodontium
- Transient discoloration might occur
- No continuing root development in immature teeth
- Dark discoloration of crown
No treatment is needed unless apical periodontitis develops

Extraction is the treatment of choice for severe extrusion in a fully formed primary tooth



- The tooth is usually displaced through the labial bone plate, or can be impinging upon the succedaneous tooth bud

When the apex is displaced toward or through the labial bone plate, the apical tip can be visualized and the tooth appears shorter than its contra lateral
When the apex is displaced toward the permanent tooth germ, the apical tip cannot be visualized and the tooth appears elongated

The tooth is completely out of the socket

A radiographic examination is essential to ensure that the missing tooth is not intruded

dislocated in a labial direction, extraction is the treatment of choice

If the apex is displaced toward or through the labial bone plate, the tooth is left for spontaneous repositioning
If the apex is displaced into the developing tooth germ, extract

It is not recommended to replant avulsed primary teeth

1 week C
3–4 weeks C + R
6–8 weeks C
6 months C+R
• 1 year C+R and (C*)

1 week C
6 months C + R
1 year C + R and (C*)

- Tooth in place or erupting
- No or transient discoloration

- Tooth locked in place
- Persistent discoloration
- Radiographic signs of apical periodontitis
- Damage to the permanent successor

Damage to the permanent successor

ممنونم از توجهتون

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