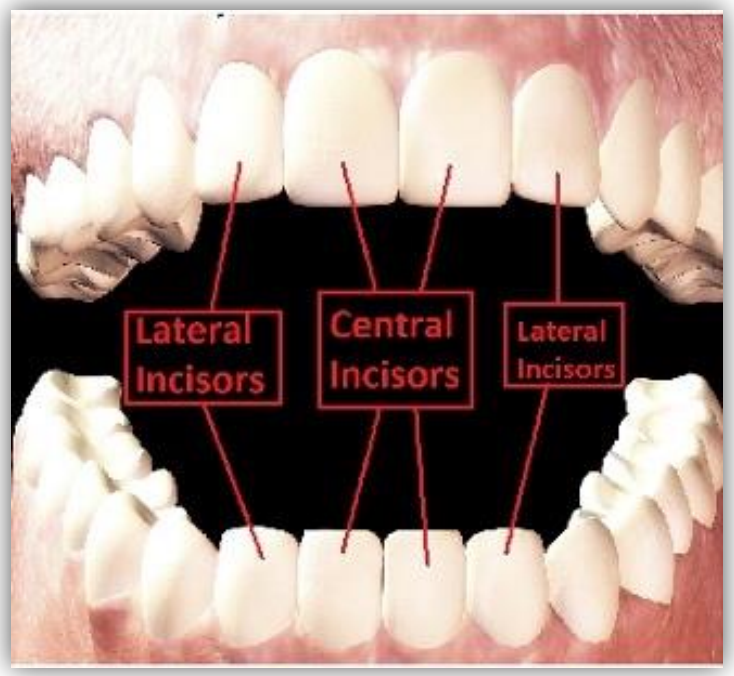
Surface Anatomy of Permanent Maxillary Incisors teeth

Dr. Fatema Elturki

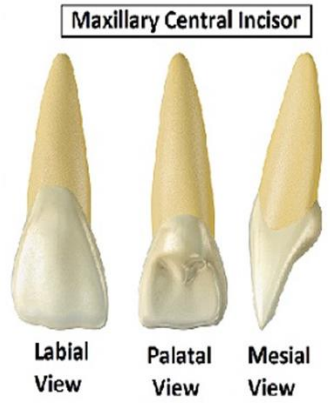
Permanent Incisors Teeth

- There are eight incisors; four in each arch and two in each quadrant.
- The central incisors are at the center of the arches, one on either side of the midline.
- The lateral incisors are distal to the central incisors.



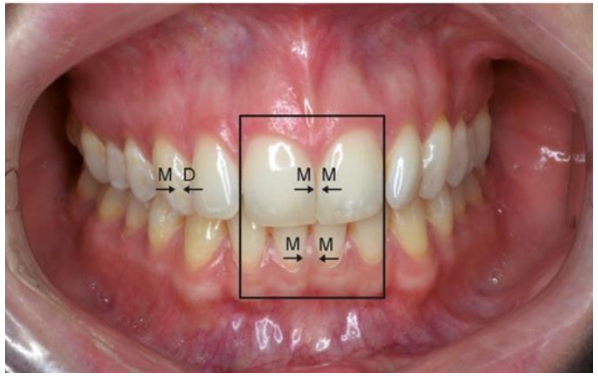
General Feature for incisors

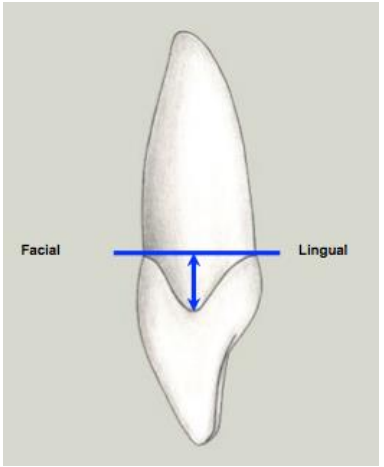
1. All incisors develop from four lobes; three labial lobes and one lingual lobe for cingulum
2. They have single, cone shaped tapering roots.
3. Their labial and lingual aspects are trapezoidal, and the proximal aspects are triangular in shape.
4. The incisal portions of the incisors are designed like the edges of blades.
5. The newly erupted incisors have three rounded eminences on their incisal portion called the mamelons, which represent the three labial lobes.



General Feature for incisors

6. All incisors have cingulum at the cervical portion of their lingual aspects and concave lingual fossa at the center of lingual surfaces.
7. The maxillary and mandibular central incisors are the only neighboring teeth in the dental arches with mesial surfaces in contact. The contact areas are relatively smaller and are nearly at the same level, especially so in the mandibular incisors.
8. The crests of both labial and lingual contours are at the same level, in the cervical third of the crown, facing each other
9. Positioned at the center of dental arches, the incisors are important for the esthetics and phonetics
10. The cervical lines on their proximal surfaces exhibit greater curvature than on other teeth.





Permanent Maxillary Central Incisors

Permanent Maxillary Central Incisors

- The maxillary central incisors are esthetically the most prominent teeth in the mouth.
- An ideal smile should have incisal dominance, i.e., maxillary incisors should be the most prominent teeth visible when one smiles.
- Any defects in the form and alignment of these teeth are easily noticed and adversely affect the normal facial appearance.
- The mesiodistal dimension of maxillary central incisor is wider than that of any other anterior tooth.

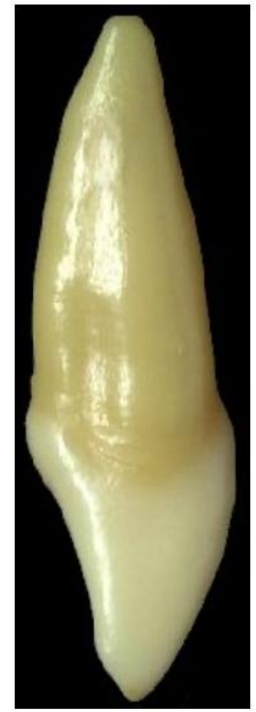
An ideal smile has incisal dominance

Maxillary central incisor have 5 aspects

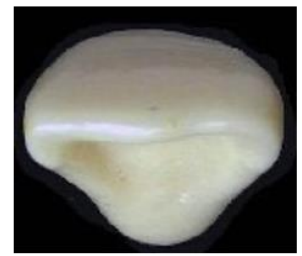
Facial

Lingual

Mesial



Distal



Incisal

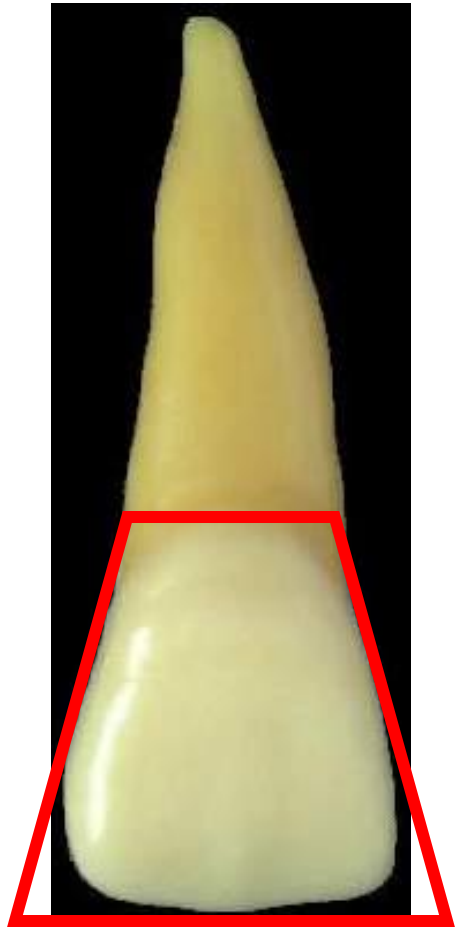
Chronology of Permanent Maxillary Central Incisor

Chronology	
First evidence of calcification	3–4 years
Enamel completed	4–5 years
Eruption	7–8 years
Root completed	10 years

Labial Aspect

Geometric shape:

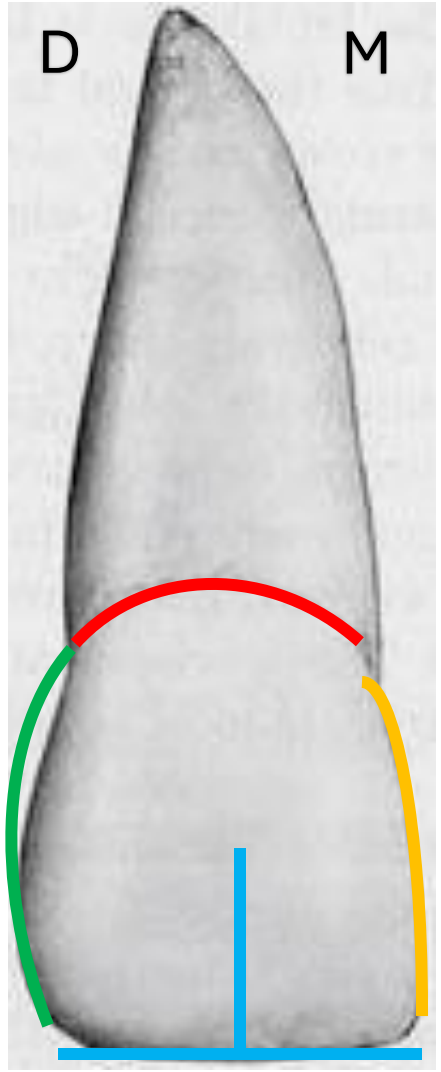
- General shape of the central incisor from labial aspect is **trapezoid** with shortest of the uneven sides towards the cervix.



Labial Aspect

Crown Outlines:

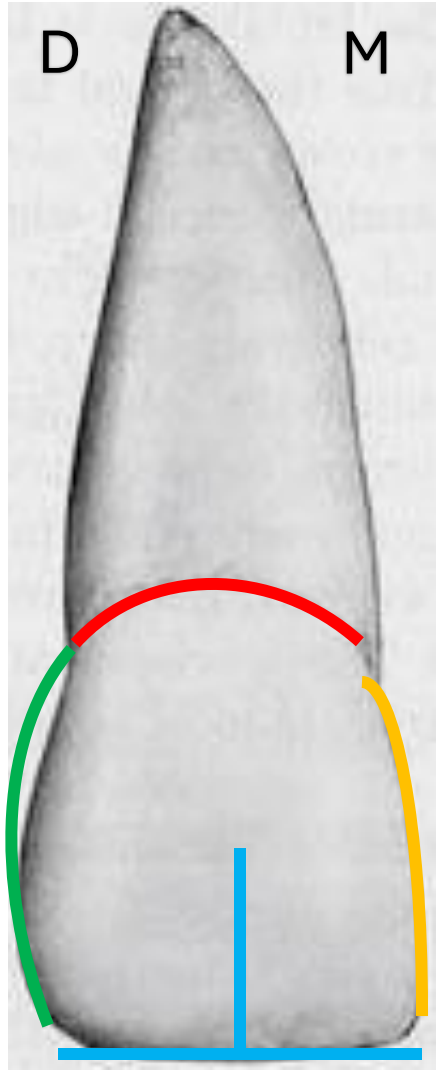
- **Mesial outline is** relatively straight or **slightly convex.**
- **Distal outline is more convex.**
- **Incisal outline is straight and perpendicular to the long axis of the tooth.**
- **The cervical line is convex root-wards.**



Labial Aspect

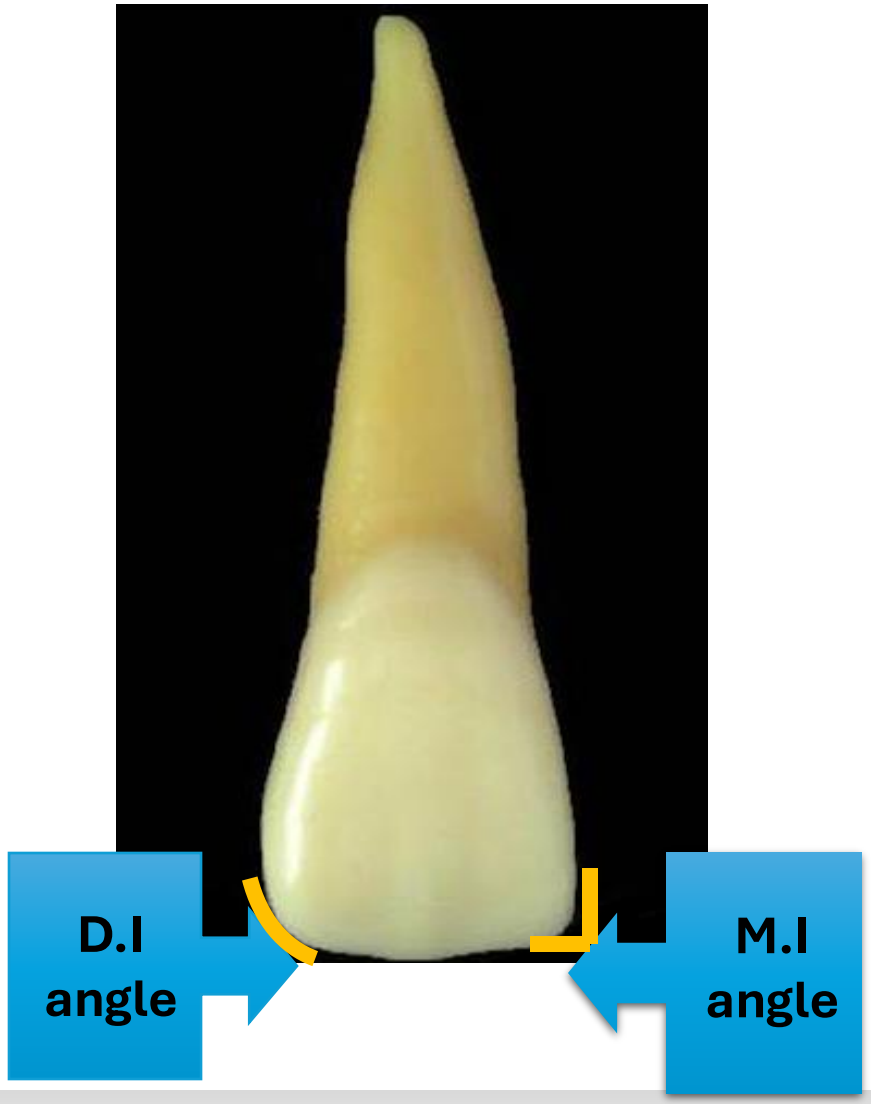
Crown Outlines:

- **Mesial outline is relatively straight or slightly convex.**
- **Distal outline is more convex.**
- **Incisal outline is formed by the incisal ridge. It is usually regually straight and perpendicular to the long axis of the tooth.**
- **The cervical line is convex root-wards (semicircular curvature towards the root).**



Labial Aspect

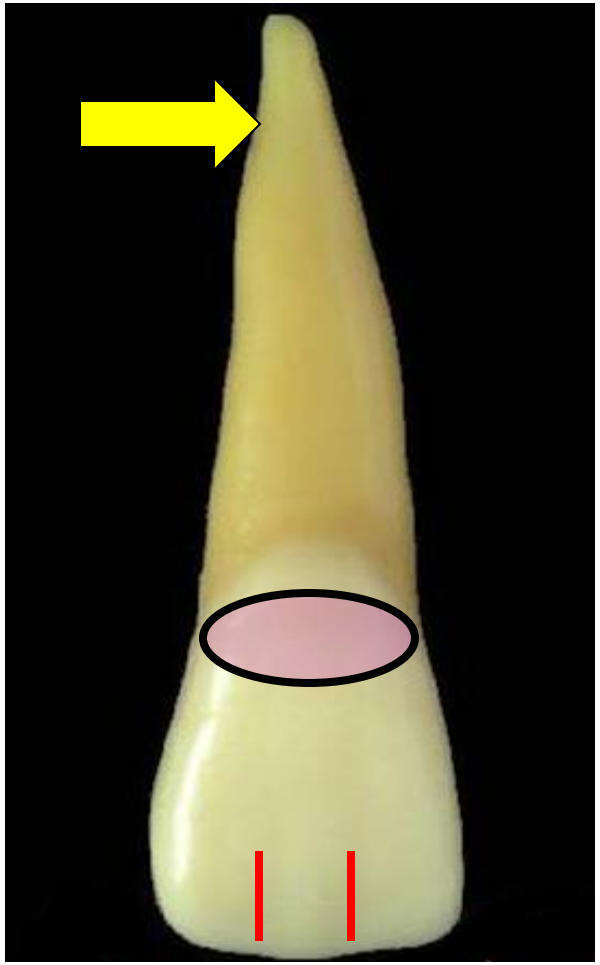
- The mesio-incisal angle is nearly **sharp**.
- The disto-incisal angle is **rounded.**
- The **crest of curvature** of mesial outline (**mesial contact a**rea) is at incisal third of the crown near the mesioincisal angle.
- The **crest of curvature** of the distal outline (**distal contact area**) is higher towards the cervical line, at the junction of incisal and middle third of the crown.



Labial Aspect

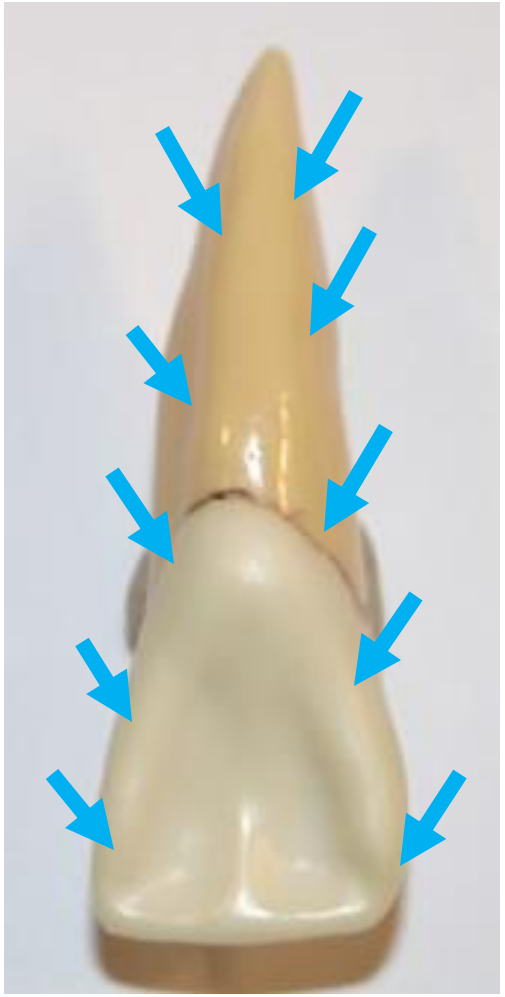
Surface anatomy:

- The tooth is longer cervicoincisally than it is wider mesiodistally
- The surface is smoothly convex and flattened incisally.
- Two shallow vertical developmental grooves divide the labial surface into 3 portions of lobes.
- Cervical ridge located at cervical third.
- It has a single root.
- It is cone shape with blunt apex.



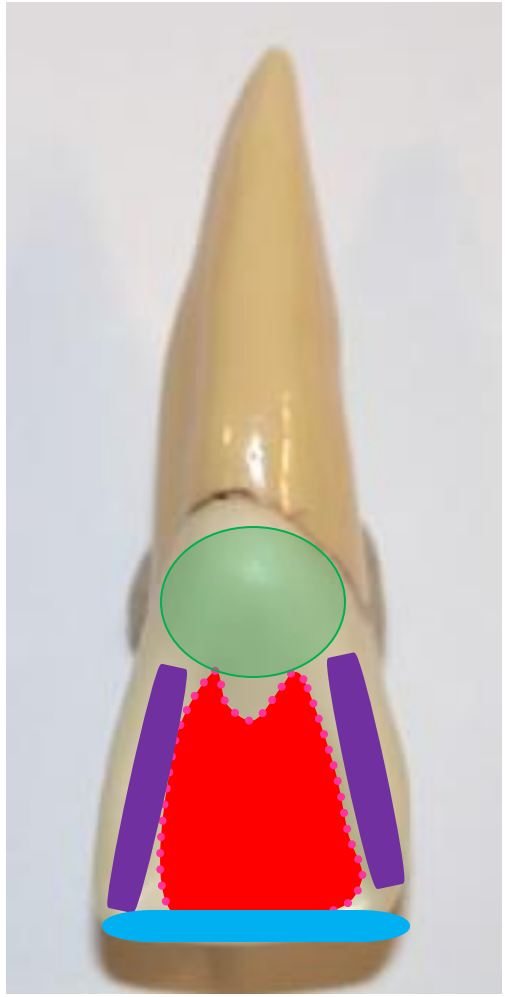
Lingual aspect

- The lingual outline of the maxillary central incisor is the reverse of that found on the labial aspect.
- The mesial and distal sides of the crown and root converge lingually (the lingual surface is narrower than the labial surface).



Lingual aspect

- ***Surface anatomy:-***
- **Elevations:**
  - Cingulum → in cervical 1/3
  - Mesial & distal marginal ridges.
  - Incisal ridge.
- **Depressions:**
  - Lingual fossa (it lies between the previous elevations).



Proximal Aspects

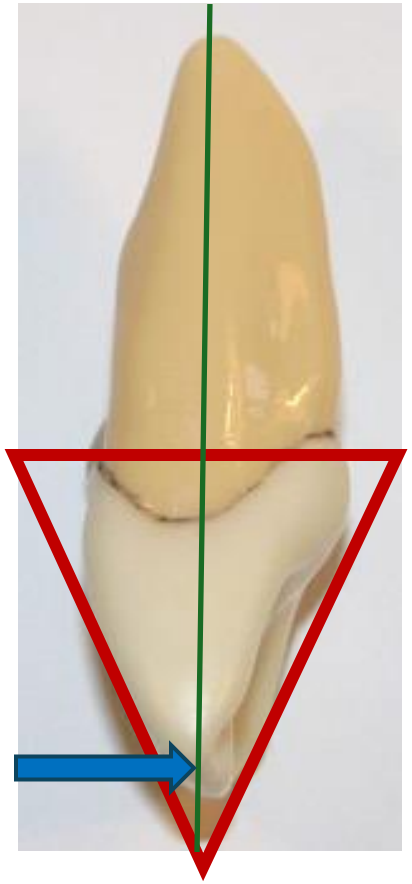
Mesial surface

Distal surface

Mesial aspect

Geometrical outline of the crown:

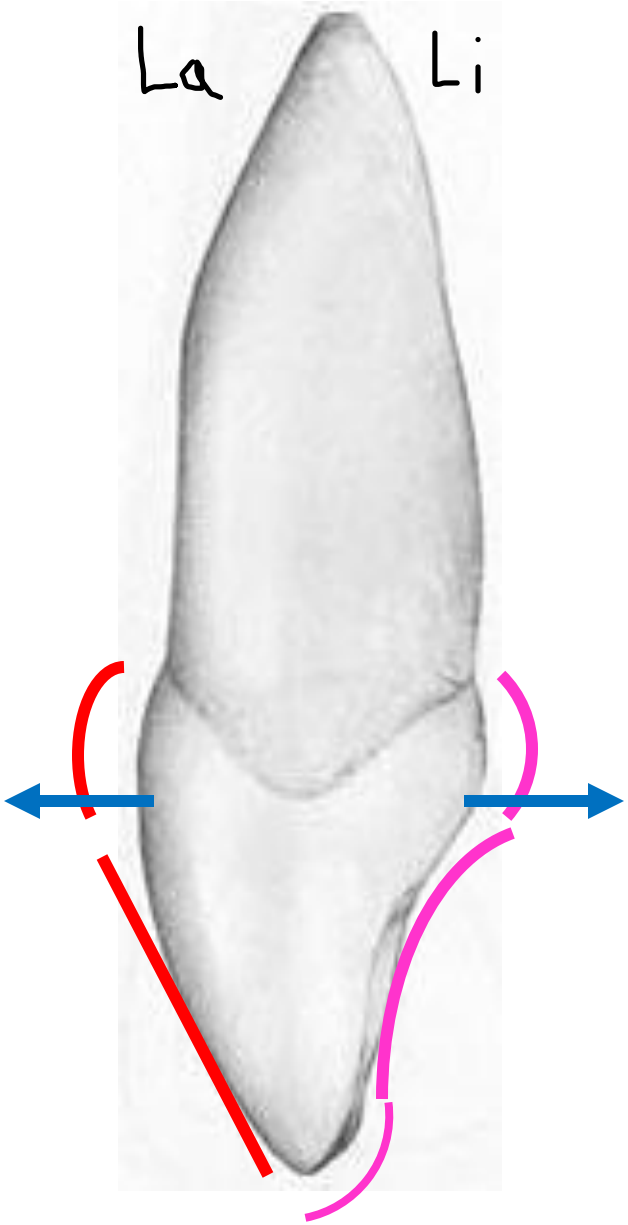
- **Triangular or wedge in shape; the base cervically and the apex incisally.**
- **The incisal ridge is on a line that bisects the center of the root.**



Mesial aspect

The crown outline:

- The labial outline is convex at cervical 1/3 (cervical ridge) then become flat to the incisal ridge.
- The lingual outline is convex at cervical 1/3 (cingulum) then concave at the lingual fossa then slightly convex for the incisal ridge.
- Labially and lingually, immediately coronal to the cervical line are the crest of curvature of these surfaces.



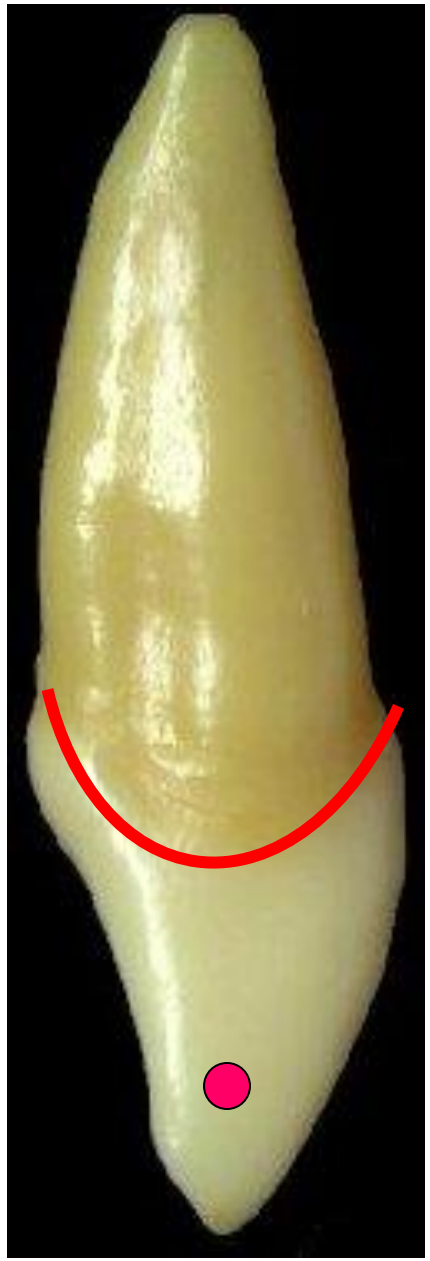
Mesial aspect

- The mesial cervical line is **convex incisally**. Its curvature is greater than any other teeth in the mouth.
- The mesial surface is **convex** with the maximum convexity at the incisal 1/3 (the **mesial contact area**)
- The **root** is cone shape with blunt apex.

Distal aspect

Similar to the mesial aspect but differ in:

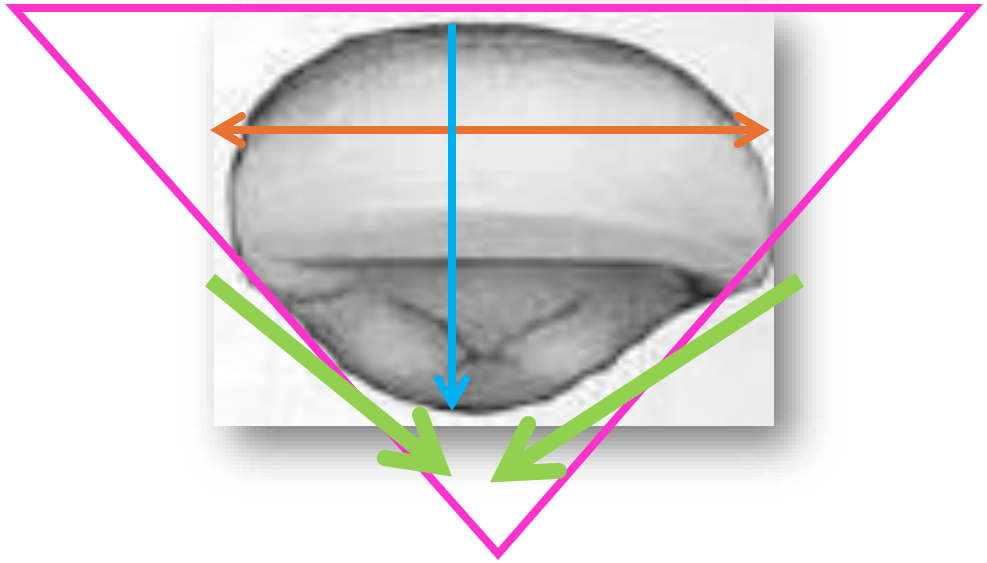
- The crown appear thicker at the incisal 1/3.
- The cervical line curvature is less than mesial (by 1 mm).
- The **contact area** located at the junction of incisal and middle thirds (the distal contact area).



Incisal aspect

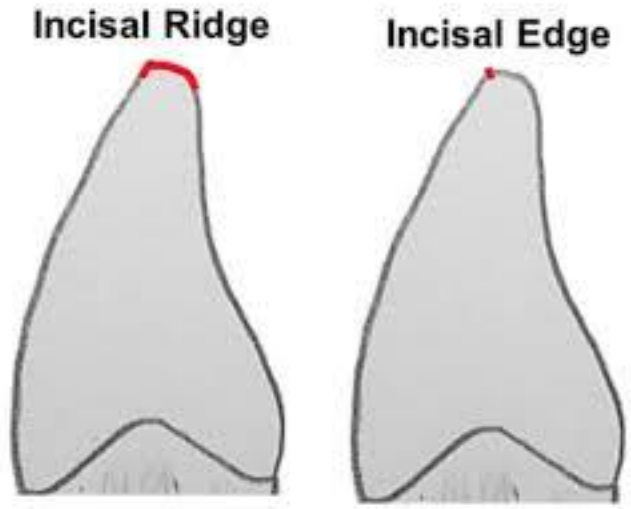
Geometric shape:

- **Triangular** in shape with **base** of the triangle towards the labial surface and **apex** towards the cingulum.
- **Mesiodistal** dimension **>** **labiolingual**.
- The labial surface is broad and flat.
- The cervical portion of the crown is convex (cervical ridge).
- The lingual outline tapers lingually to the cingulum (**lingual convergence**).



Incisal Ridge and Incisal Edge

Incisal Ridge	Incisal Edge
• It is the rounded incisal portion of a newly erupted incisor, which merges with the mesioincisal and distoincisal angles and the labial and lingual surfaces. • This linear elevation on incisal aspect of crown is called the incisal ridge	• In a functional tooth with occlusal wear (attrition), an incisal edge can be seen. • The term 'edge' means an angle formed by the merging of two flat surfaces. • Incisal edge is not present in newly erupted incisor.
	



Permanent Maxillary Lateral Incisor

Chronology of Permanent Maxillary Lateral Incisor

Chronology	
First evidence of calcification	**1 year**
Enamel completed	**4–5 years**
Eruption	**8–9 years**
Root completed	**11 years**

Permanent Maxillary Lateral Incisor

Labial

Lingual

Mesial

Distal

Incisal

The maxillary lateral incisor is similar to the maxillary central incisor except for the following details:

Labial Aspect

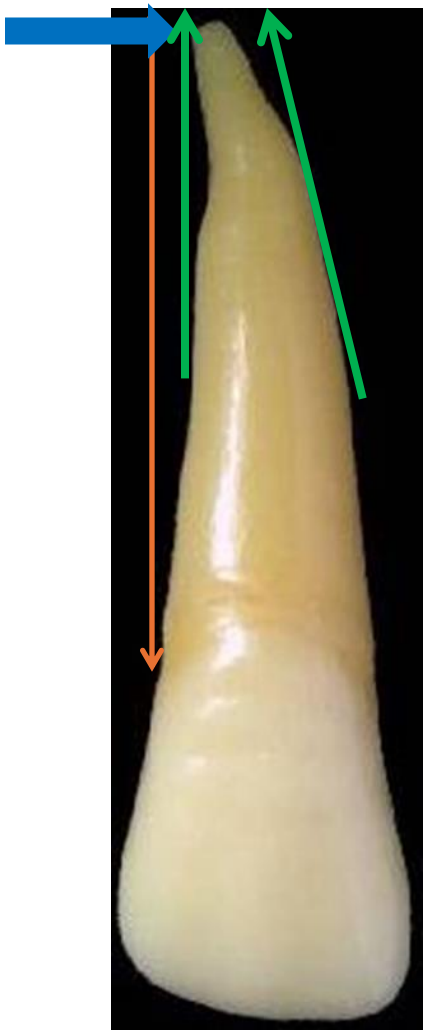
- usually it has more curvature, with a rounded incisal ridge and rounded incisal angles mesially and distally.
- the crown is smaller in all dimensions.
- The labial surface of the crown is more convex than that of the central incisor
- The crest of contour mesially is usually at the point of junction of the middle and incisal thirds.
- the mesioincisal angle is more rounded than that found on maxillary central incisors.

Labial Aspect

- The distal outline is always more rounded, and the crest of contour is more cervical, usually in the center of the middle third.
- Some forms describe a semicircular outline distally from the cervix to the center of the incisal ridge.

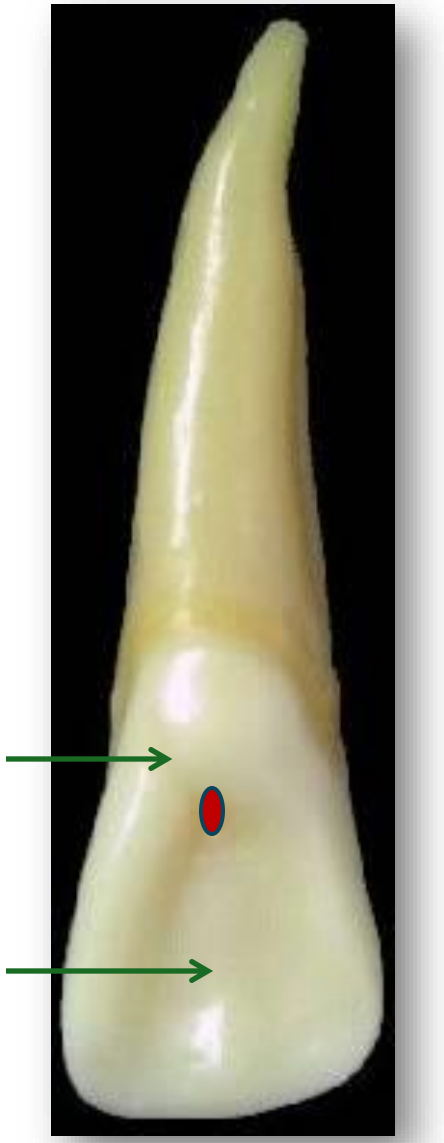
Labial Aspect

- its root length is greater in proportion to its crown length than that of the central incisor.
- The root tapers evenly from the cervical line to a point approximately two thirds of its length apically.
- In most cases, it curves sharply from this location in a distal direction and ends in a pointed apex.



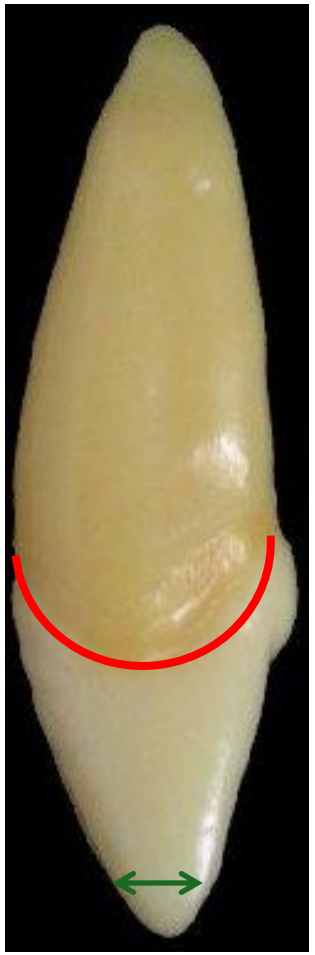
Lingual aspect

- All elevations and depression are more developed than the upper central incisor.
- Deep developmental grooves within the lingual fossa maybe present, where it joins the cingulum.
- Faults in the enamel of the crown (lingual pit) are often found in the deep portions of these developmental grooves



Mesial aspect

- The crown is shorter, the root is relatively longer, and the labiolingual measurement of the crown and root is a millimeter or so less than the maxillary central incisor of the same mouth.
- The curvature of the cervical line is marked in the direction of the incisal ridge.
- The heavy development of the incisal ridge accordingly makes the incisal portion appear somewhat thicker than that of the central incisor.
- The root appears as a tapered cone from this aspect, with a bluntly rounded, apical end.

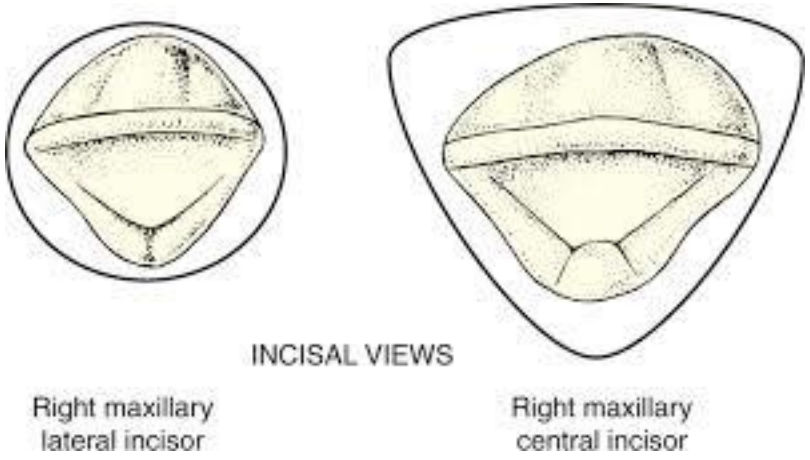


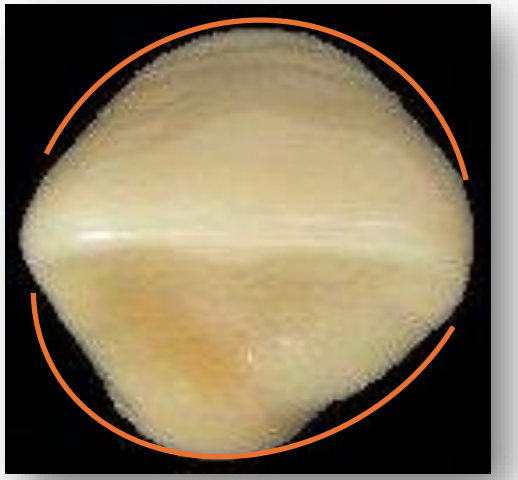
Distal aspect

- The curvature of the cervical line is usually a millimeter or so less in depth than on the mesial side.
- It is common to find a developmental depression distally on the root for part or all of its length.

Incisal aspect

- Most maxillary permanent lateral incisors resemble **maxillary permanent central incisors** from this aspect, i.e. triangular outline
- Some maxillary permanent lateral incisors resemble small **maxillary permanent canines** from incisal aspect, i.e., oval outline, due to their prominent large cingulum and incisal ridge.
- Maxillary lateral incisors exhibit more convexity labially and lingually from the incisal aspect than maxillary central incisors.





Permanent Maxillary Lateral Incisor Variations from Normal

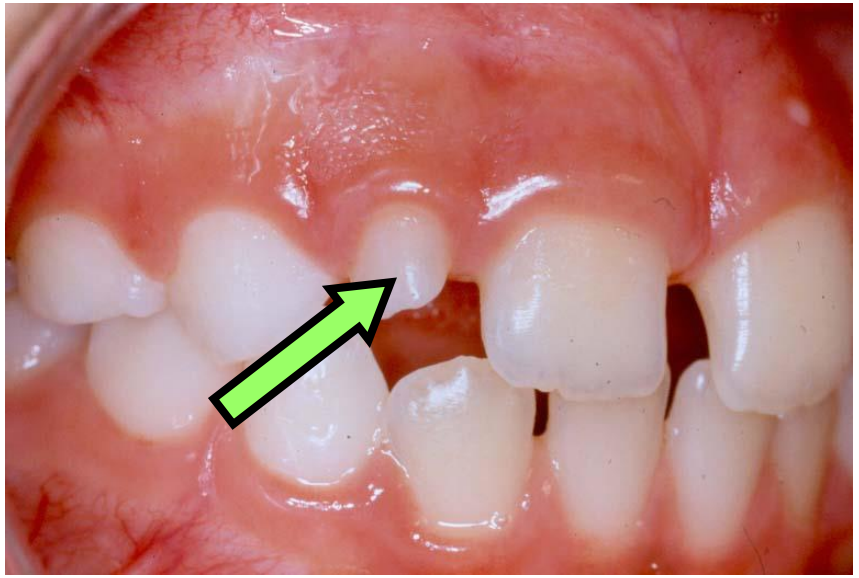
- The maxillary lateral incisors vary in form more than any other tooth in oral cavity except the third molars.
- If the variation is too great, it is considered a developmental anomaly.

Variations from Normal

Deep palato-radicular

Lingual tubercle

Malformations Of The Upper Permanent Lateral Incisor

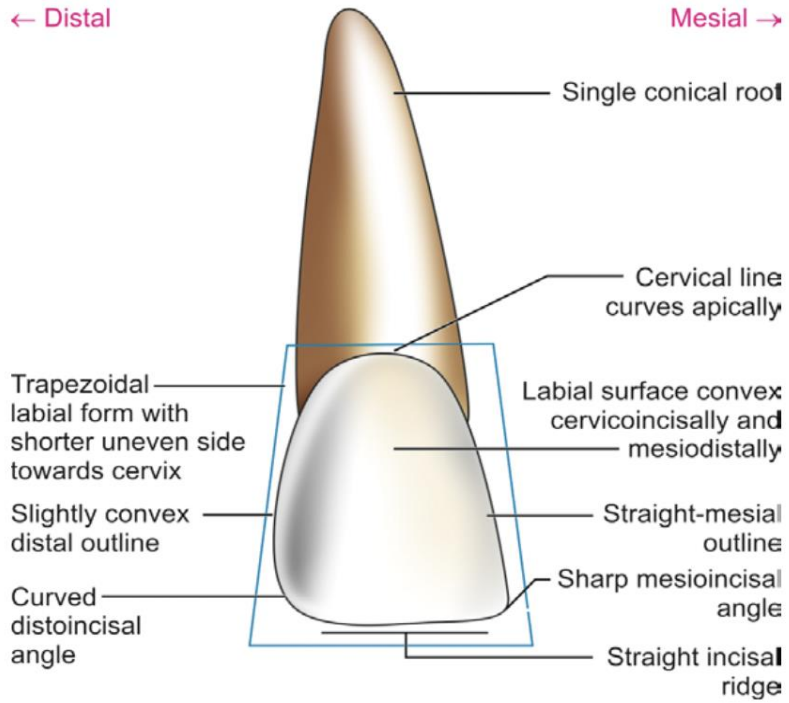
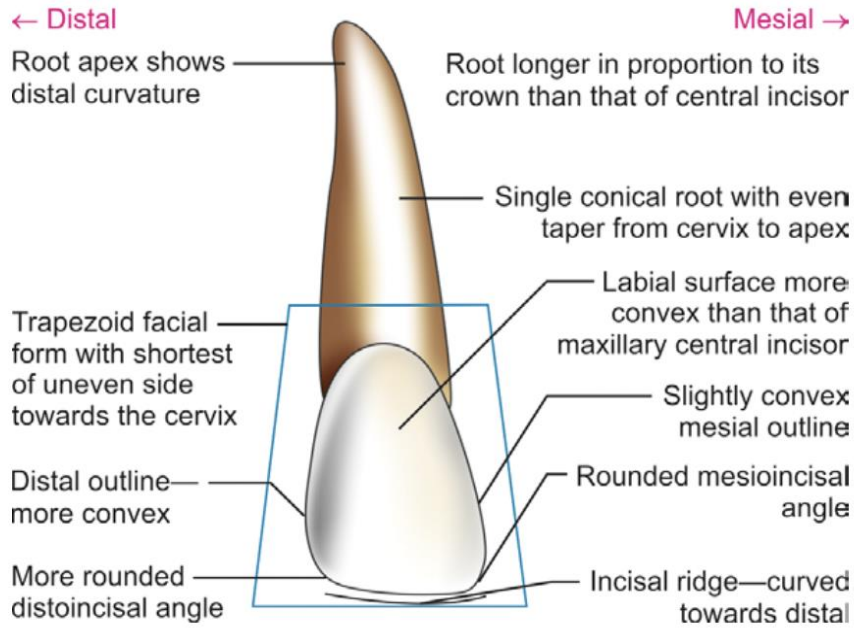


Peg-shaped lateral incisor.

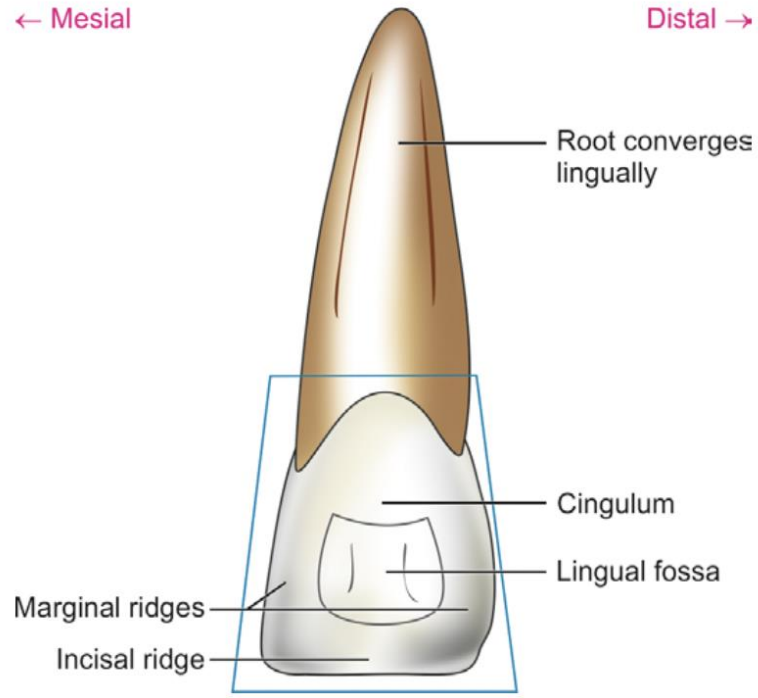
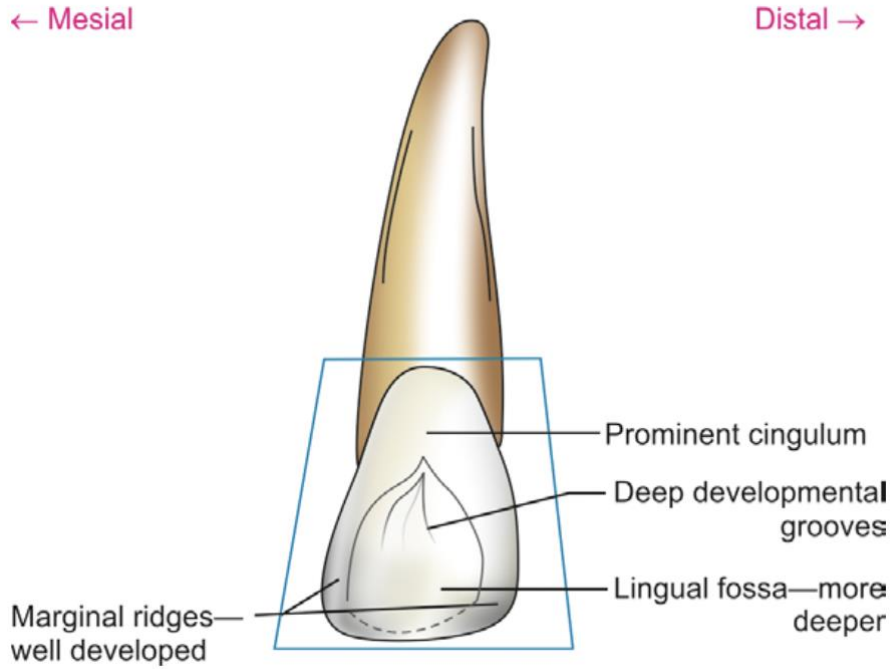
Missing lateral incisor.

Comparison between Maxillary Central and Lateral Incisors

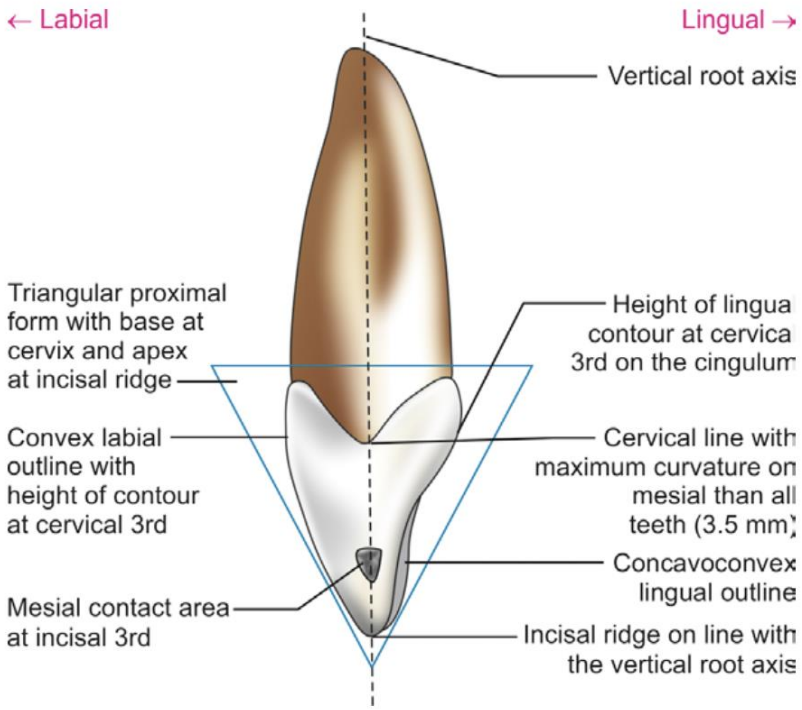
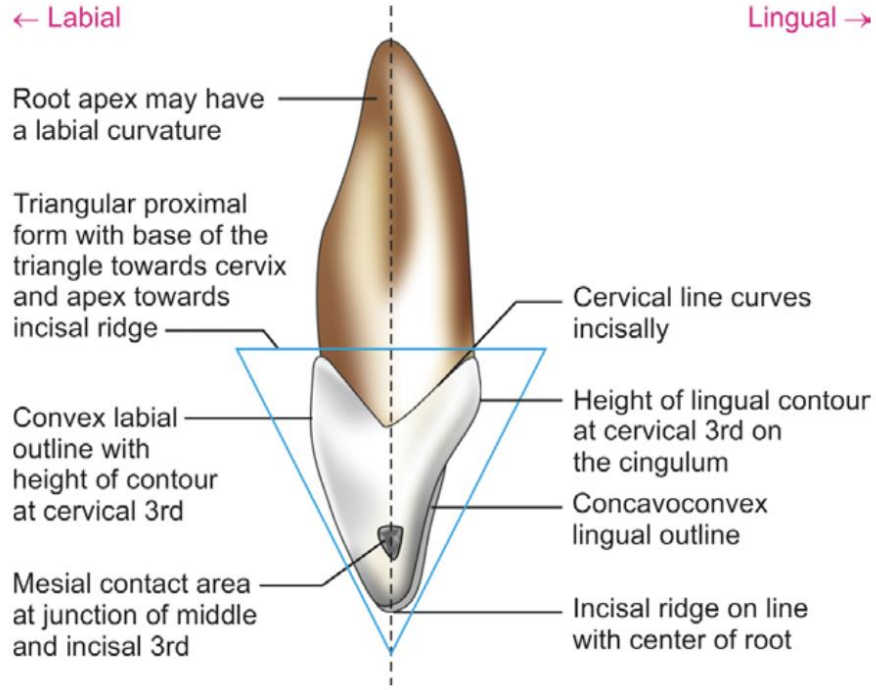
Labial Aspect

Maxillary Central Incisor	Maxillary Lateral Incisor
	

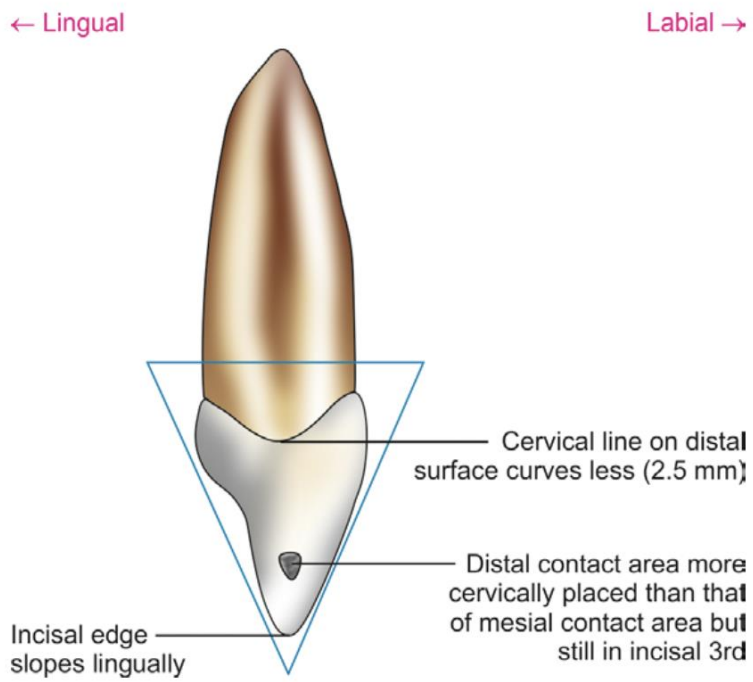
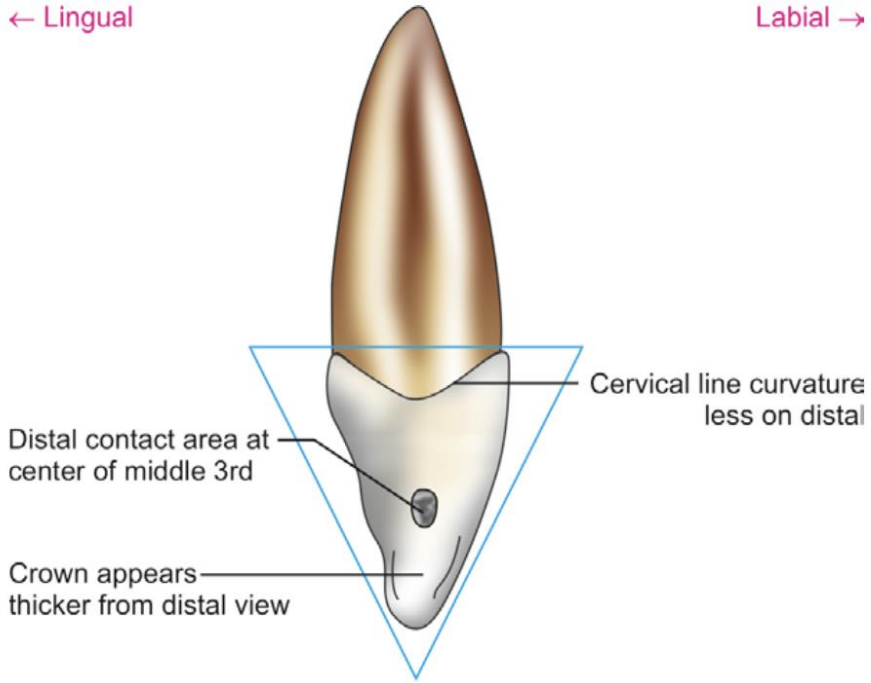
Lingual Aspect

Maxillary Central Incisor	Maxillary Lateral Incisor
	

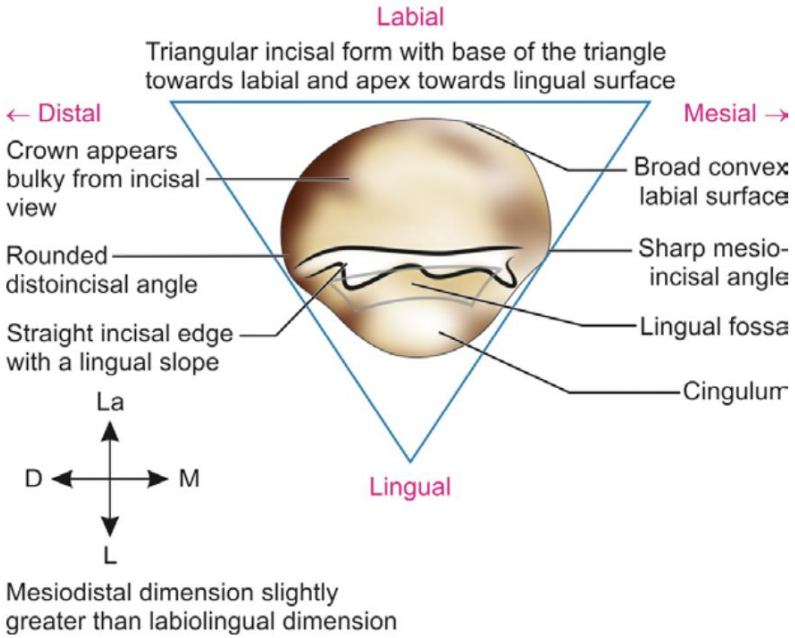
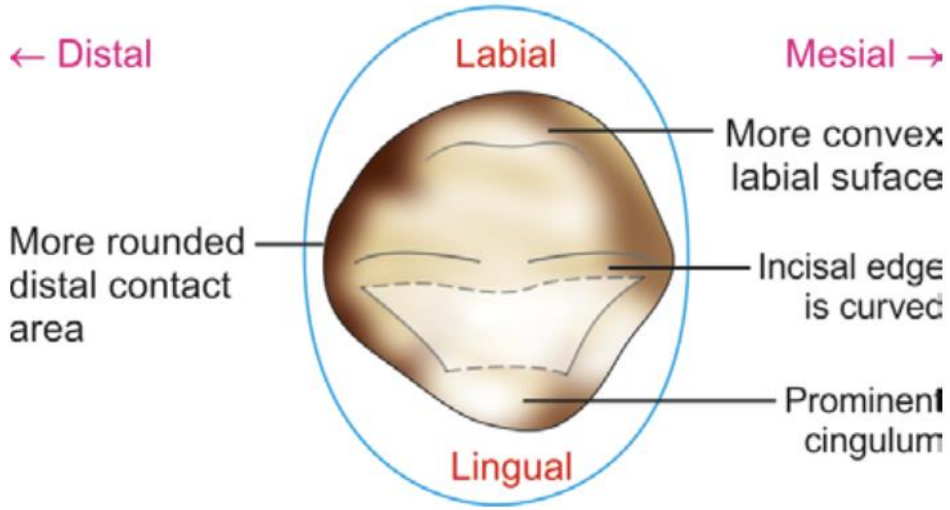
Mesial Aspect

Maxillary Central Incisor	Maxillary Lateral Incisor
	

Distal Aspect

Maxillary Central Incisor	Maxillary Lateral Incisor
	

Incisal Aspect

Maxillary Central Incisor	Maxillary Lateral Incisor
	

Thank you