

Permanent Mandibular Incisors

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Mandibular Incisors

- They are four in number (2 central incisors and 2 lateral incisors).
- The permanent mandibular incisors are the smallest teeth of the permanent dentition and the most symmetric.
- They have smaller mesiodistal dimensions than all other teeth.
- They are also among the first permanent teeth to erupt into the oral cavity along with the 1st molars.
- A newly erupted tooth shows mamelons on the incisal ridge.
- The central and lateral incisors of the mandibular arch resemble each other.
- Generally, the lateral incisor is larger than the central incisor, in contrast to the teeth in the maxillary arch.





Permanent Mandibular Central Incisor

Chronology of Permanent Mandibular Central Incisor

First evidence of calcification	3–4 years
Enamel completed	4–5 years
Eruption	<u>6–7 years</u>
Root completed	9 years

Permanent Mandibular Central Incisor



Labial



Lingual



Incisal



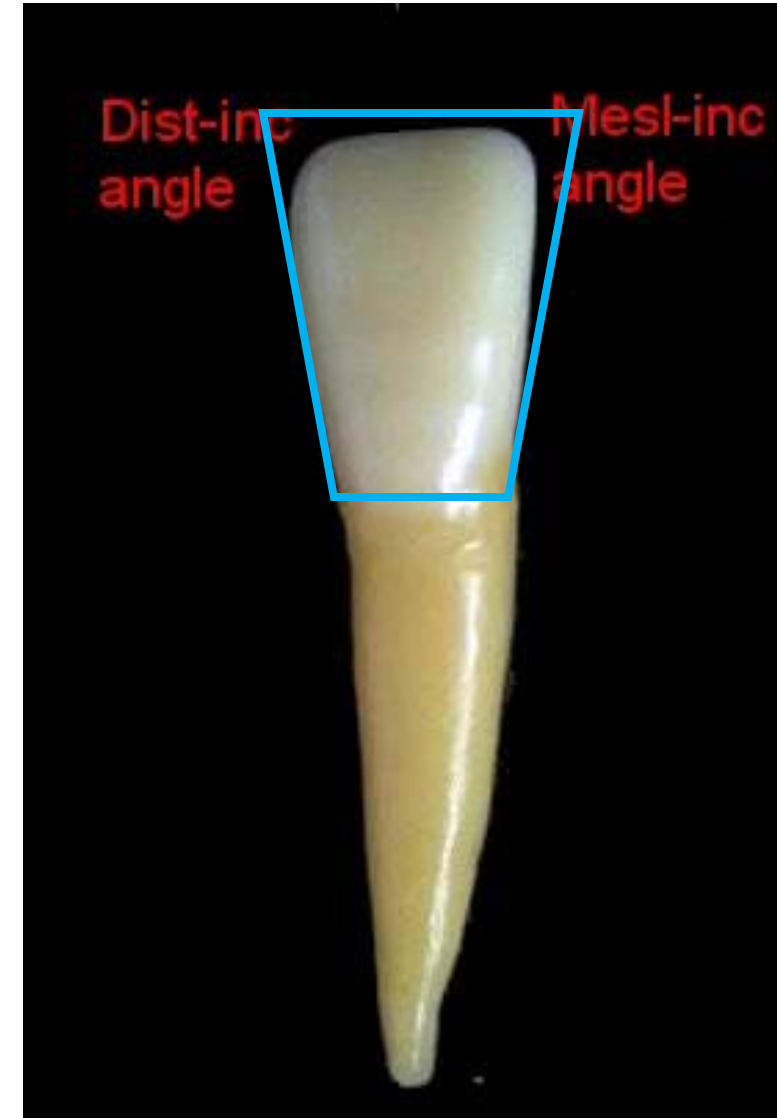
Mesial



Distal

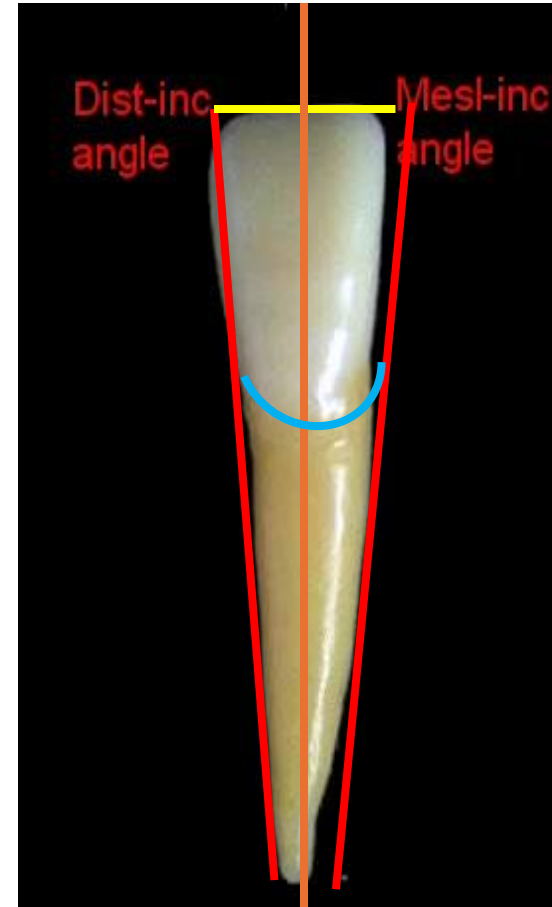
Labial Aspect

- **Geometric shape:** Trapezoidal from labial and lingual aspects with shortest of the uneven sides towards cervix.



Labial aspect

- The labial aspect of mandibular central incisor is regular, tapering evenly from the relatively sharp mesial and distal incisal angles to the apical portion of the root.
- The incisal ridge is straight and perpendicular to the long axis of the tooth.
- The cervical line is convex root-wards.



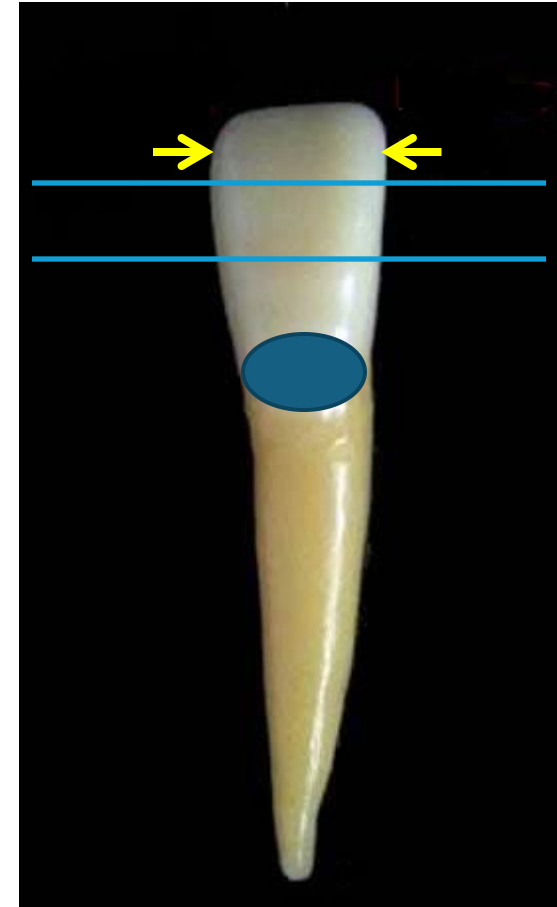
Labial aspect

The surface is convex both mesiodistally and incisocervically.

Cervical ridge located at cervical third.

The contact areas mesially and distally present incisal to the junction between incisal and middle third.

The root tapers evenly to apical 1/3 , then curves distally with a pointed apex. Sometimes the root is straight.



Lingual Aspect

- The crown of a mandibular central incisor is **narrower on the lingual surface than on the labial surface (lingual convergence)**.
- The lingual aspect is reverse of labial aspect.



Lingual Aspect

Surface anatomy:

The elevations:

- The cingulum (present at cervical 1/3).
- Marginal ridges.
 - Mesial marginal ridge.
 - Distal marginal ridge.
- Incisal ridge.

The depressions:

- The lingual fossa (it lies between the previous elevations).

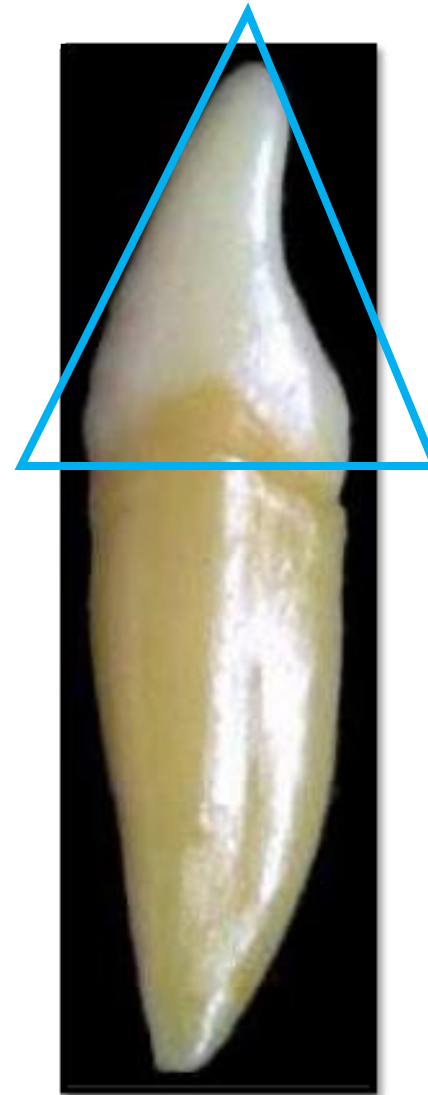
All elevations and depression are poorly developed than the upper incisor.



Mesial Aspect

Geometric outline of the crown:

- **Triangular** in shape.
 - the **base cervically** and the **apex incisally**.

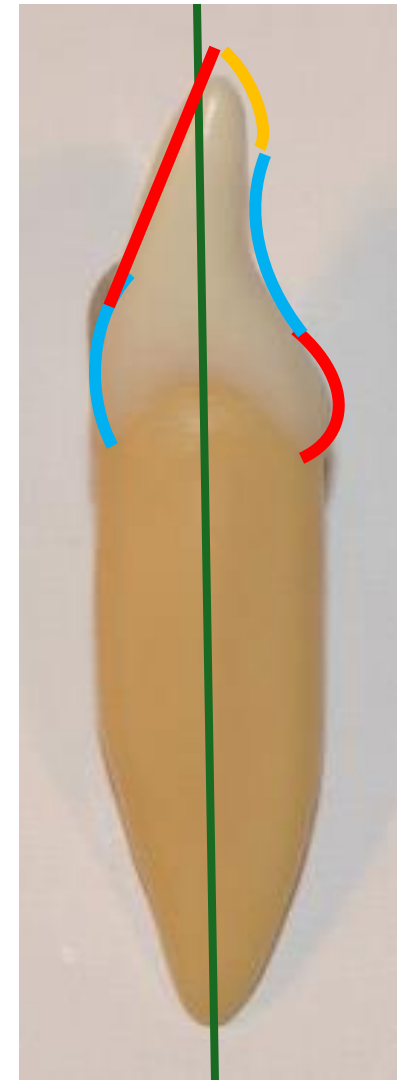


Mesial Aspect

- The incisal ridge is lingual to a line that bisects the center of the root.

The outline:

- The labial outline is convex at cervical 1/3 (cervical ridge), Then become straight to the incisal ridge.
- The lingual outline is convex at cervical 1/3 (cingulum), then straight to slightly concave at the lingual fossa, then slightly convex for the incisal ridge.



Mesial Aspect

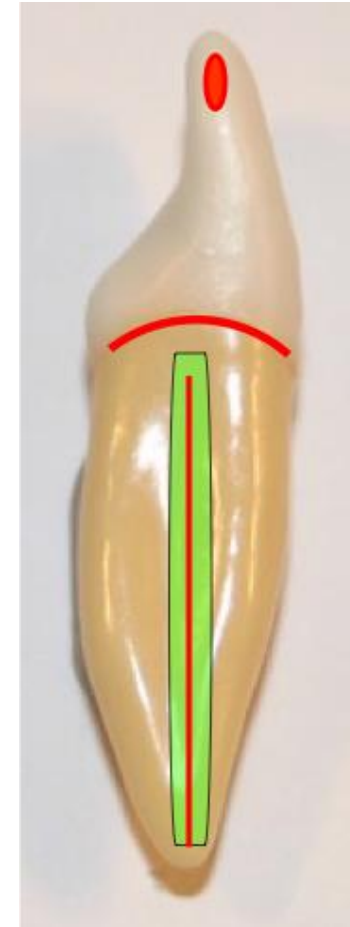
- The cervical line is marked curving incisally approximately $\frac{1}{3}$ the length of the crown.
- The **mesial contact area** is present at the junction between middle and incisal third.
- The root have a **broad developmental depression**.



Distal Aspect

Similar to the mesial aspect but differs in:

- The cervical line curvature is less than mesial (by 1 mm).
- The distal contact area at the same level as the mesial surface.
- The distal developmental depression on the root is deeper than mesial and may have developmental groove.

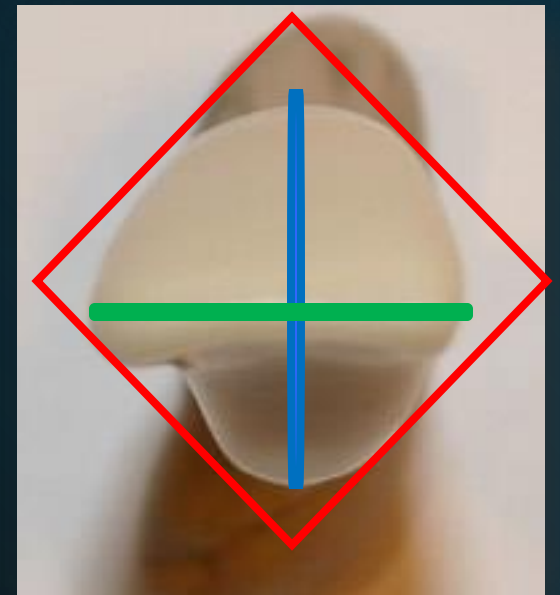


Incisal Aspect

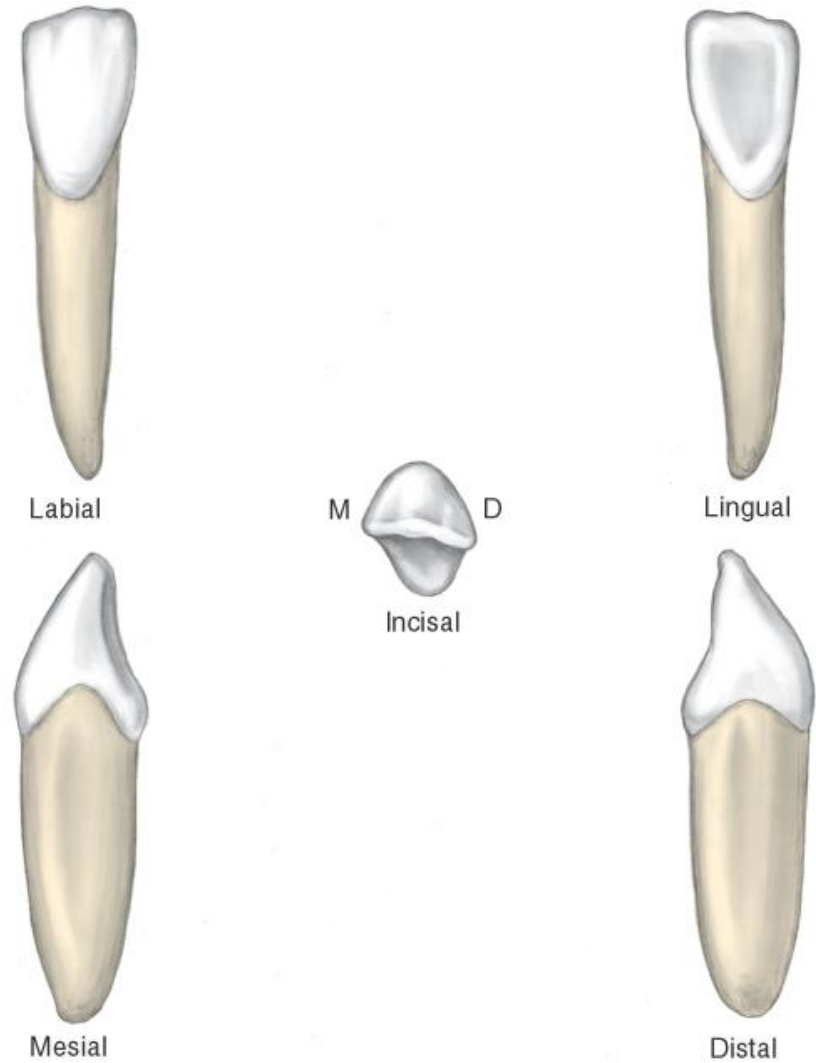
Geometric outline of the crown:

Diamond shape

- The incisal edge is straight.
- The incisal edge is perpendicular to a line bisecting the crown labiolingually.
- The labial outline broader than the lingual outline



Mandibular Lateral Incisor



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Chronology of Permanent Mandibular Lateral Incisor

First evidence of calcification	3–4 years
Enamel completed	4–5 years
Eruption	<u>7–8 years</u>
Root completed	10 years

Mandibular Lateral Incisor



Labial



Lingual



Incisal



Mesial



Distal

Labial Aspect

- It is larger than the central by about 0.5 mm in all dimensions.
- The incisal edge is straight and slop downward in a distal direction.
- The distal angle is rounded.
- The root is longer than the central incisor.

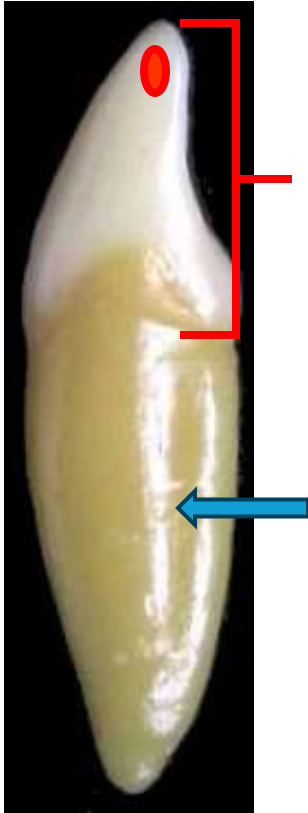


Lingual Aspect

- The **mesial outline** is longer than the **distal outline**.
- The **mesial marginal ridge** is longer than the **distal marginal ridge**.

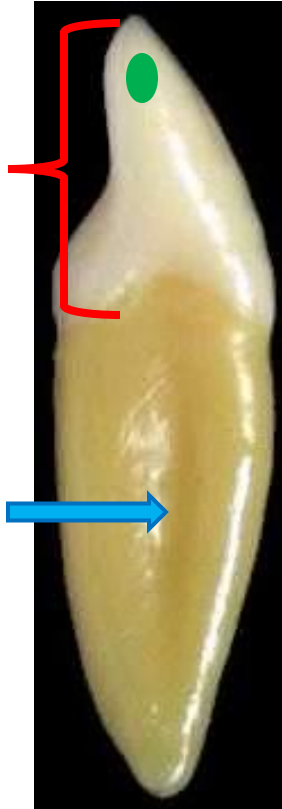


Proximal Aspects



Mesial aspect

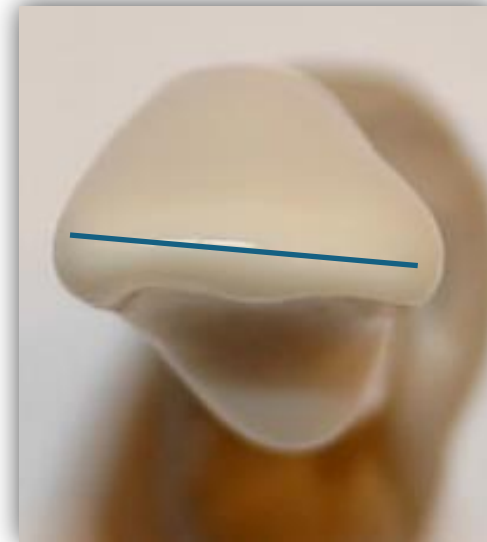
- The distal surface is shorter inciso-cervically.
- The **distal** contact area is more cervical than the **mesial** one.
- **Root depressions** are seen on both the mesial and distal surfaces.



Distal aspect

Incisal Aspect

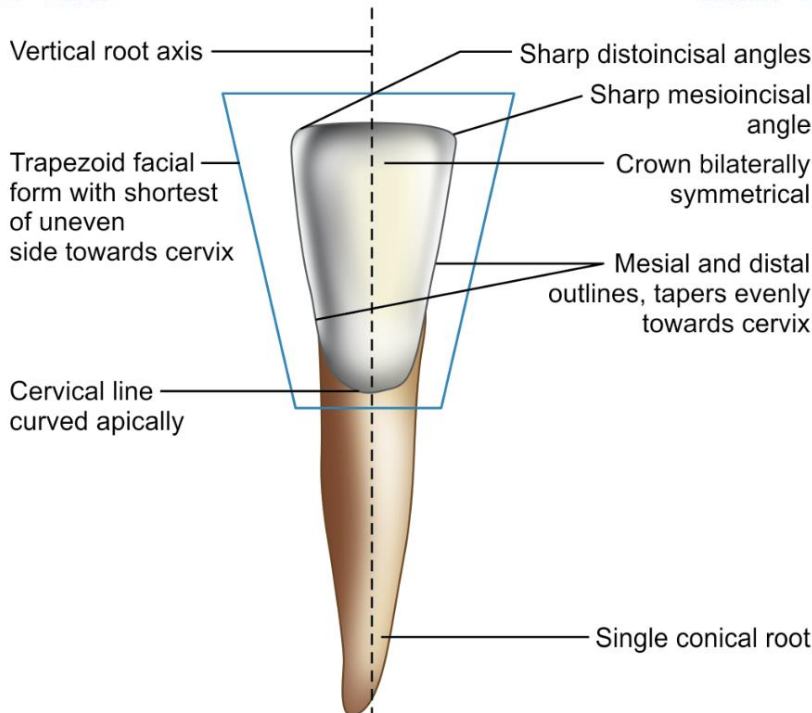
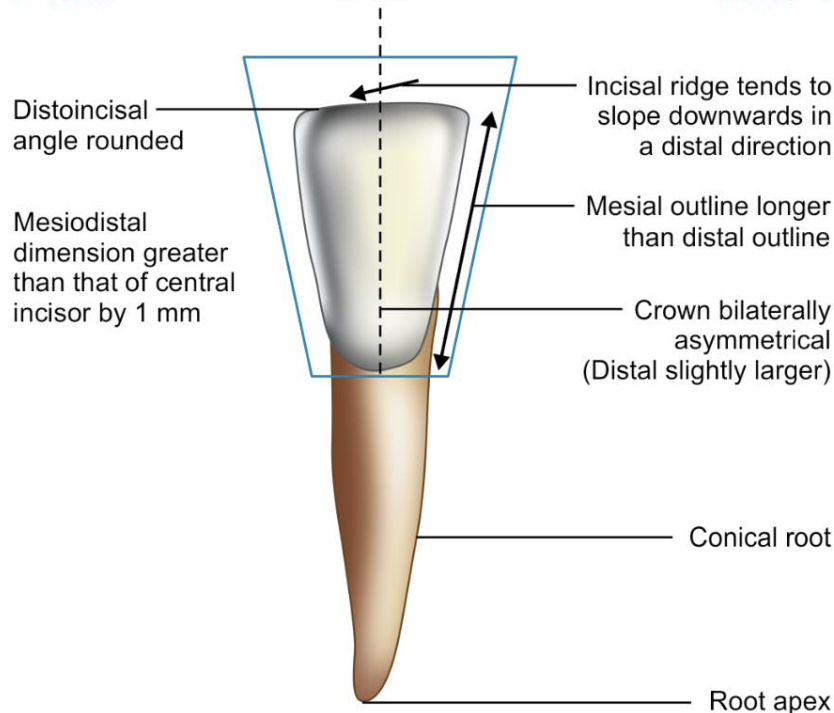
- The incisal ridge is **tilted distally and lingually**.
- The **cingulum** is shifted to the distal.
- **This form fits the narrow U – shaped mandibular arch.**



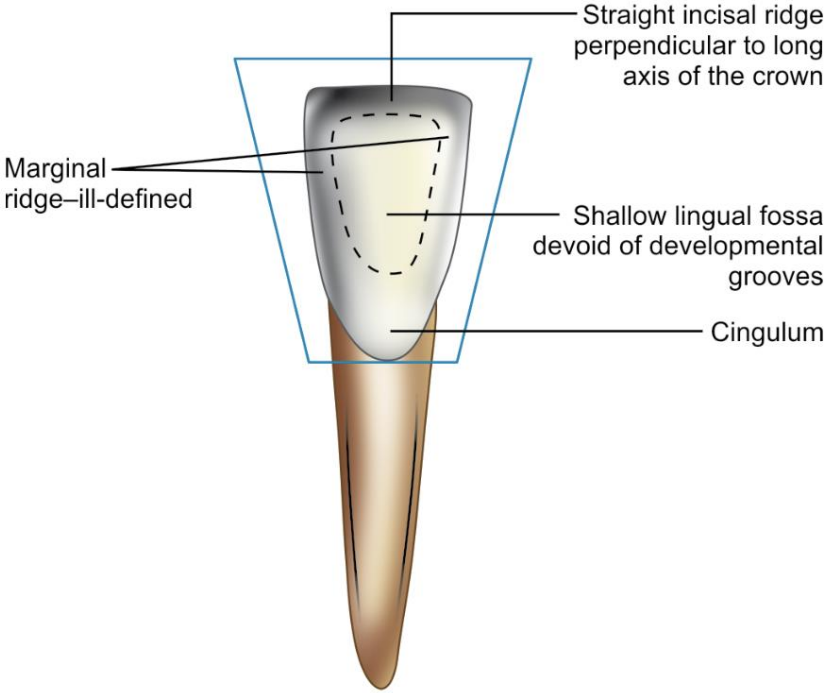
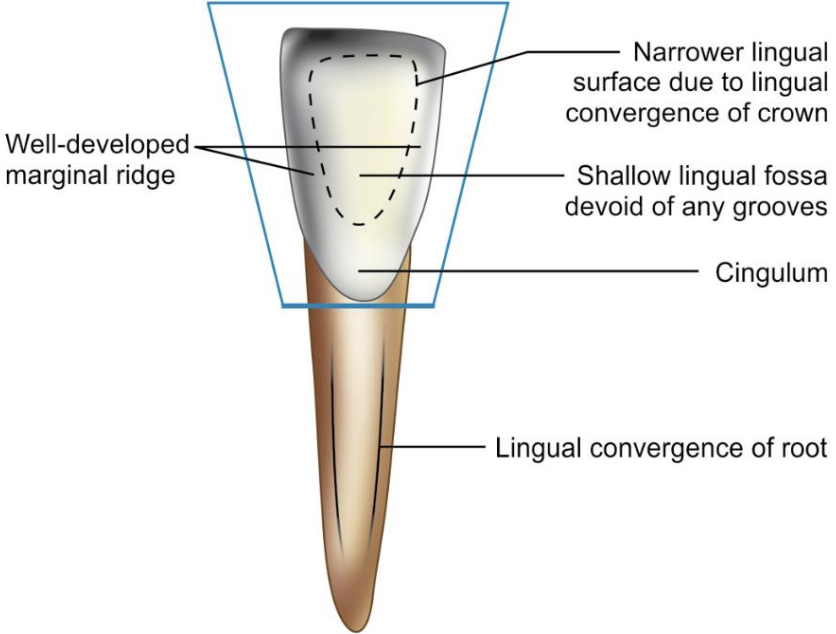


Comparison between Mandibular Central and Lateral Incisors

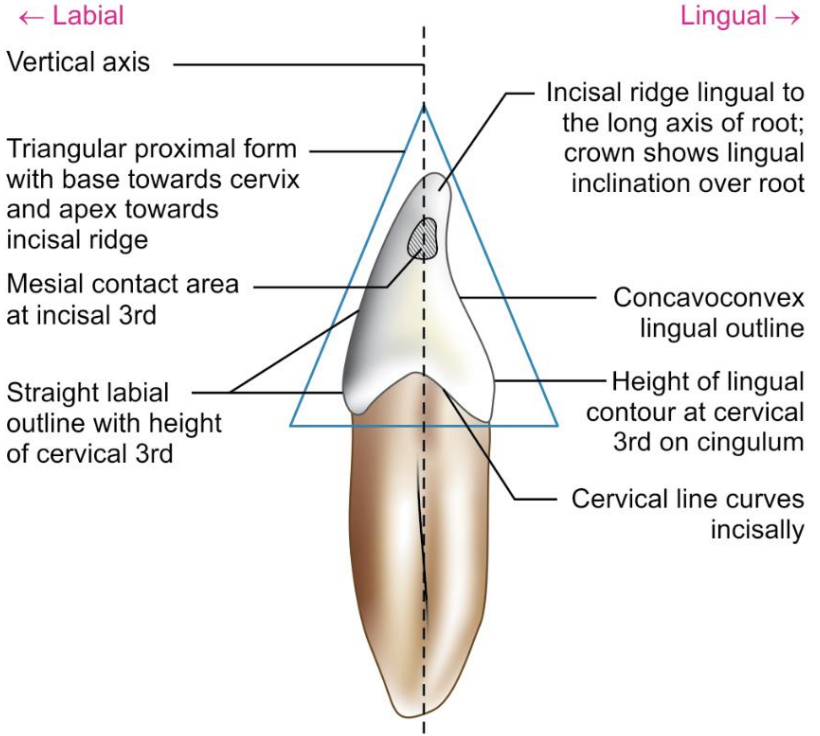
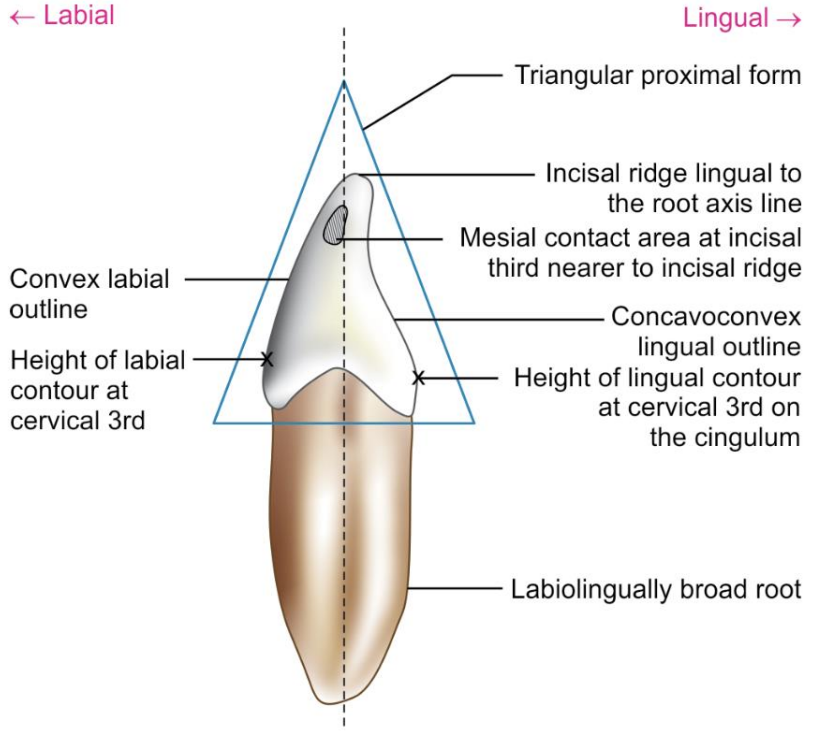
Labial Aspect

Mandibular Central Incisor	Mandibular Lateral Incisor
<p>← Distal Mesial →</p>  <p>Vertical root axis</p> <p>Sharp distoincisor angles</p> <p>Sharp mesioincisor angle</p> <p>Trapezoid facial form with shortest of uneven side towards cervix</p> <p>Crown bilaterally symmetrical</p> <p>Mesial and distal outlines, tapers evenly towards cervix</p> <p>Cervical line curved apically</p> <p>Single conical root</p>	<p>← Distal Mesial →</p> <p>Midline</p>  <p>Distoincisor angle rounded</p> <p>Mesiodistal dimension greater than that of central incisor by 1 mm</p> <p>Incisal ridge tends to slope downwards in a distal direction</p> <p>Mesial outline longer than distal outline</p> <p>Crown bilaterally asymmetrical (Distal slightly larger)</p> <p>Conical root</p> <p>Root apex</p>

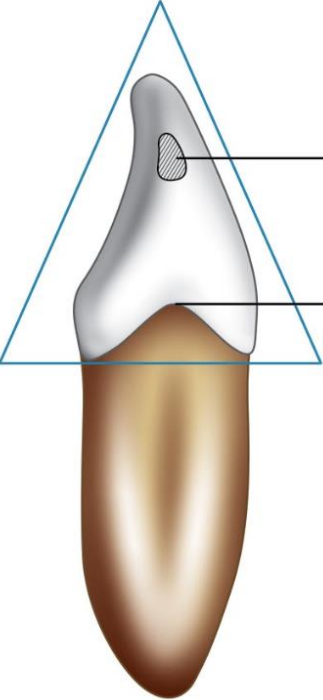
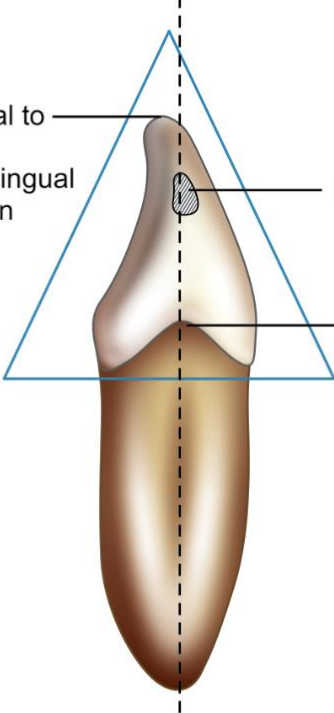
Lingual Aspect

Mandibular Central Incisor	Mandibular Lateral Incisor
<p data-bbox="300 482 417 504">← Mesial</p> <p data-bbox="1014 482 1131 504">Distal →</p>  <p data-bbox="300 696 494 753">Marginal ridge—ill-defined</p> <p data-bbox="868 542 1131 628">Straight incisal ridge perpendicular to long axis of the crown</p> <p data-bbox="828 742 1131 828">Shallow lingual fossa devoid of developmental grooves</p> <p data-bbox="1003 856 1131 878">Cingulum</p>	<p data-bbox="1429 496 1546 518">← Mesial</p> <p data-bbox="2135 496 2252 518">Distal →</p>  <p data-bbox="1421 699 1615 756">Well-developed marginal ridge</p> <p data-bbox="1982 611 2252 696">Narrower lingual surface due to lingual convergence of crown</p> <p data-bbox="1982 728 2252 785">Shallow lingual fossa devoid of any grooves</p> <p data-bbox="2135 828 2252 849">Cingulum</p> <p data-bbox="1913 999 2252 1021">Lingual convergence of root</p>

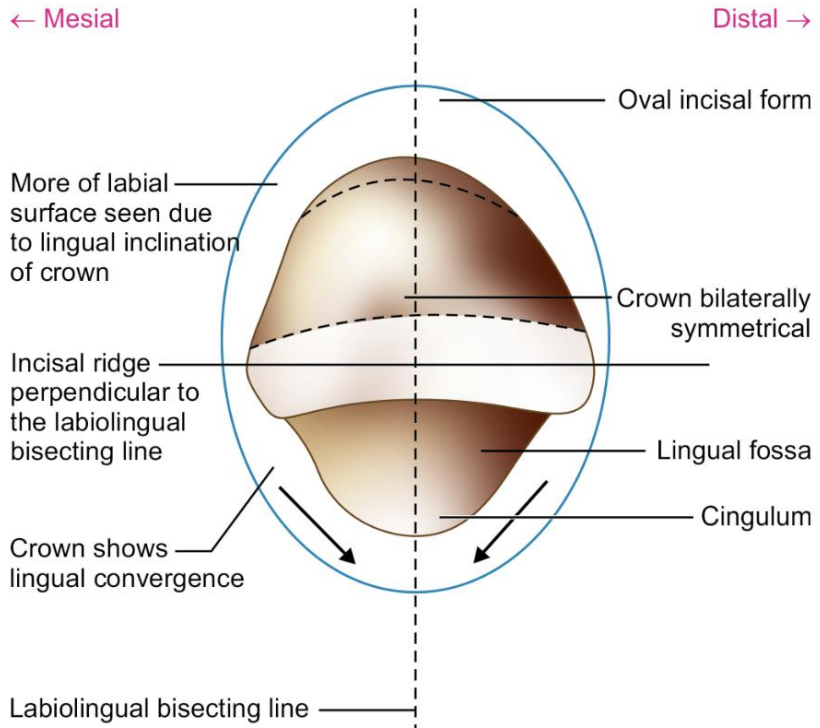
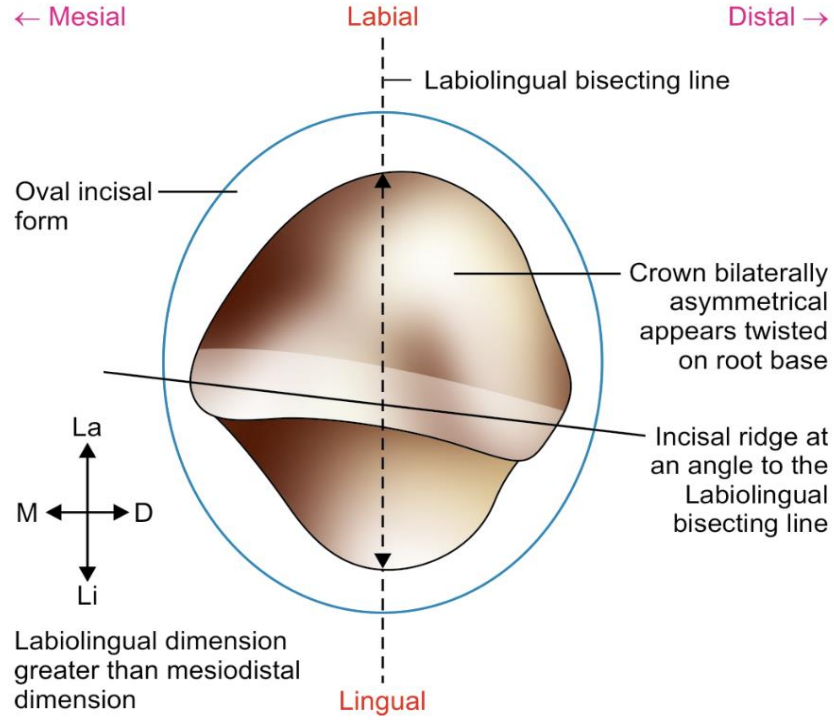
Mesial Aspect

Mandibular Central Incisor	Mandibular Lateral Incisor
 <p>← Labial</p> <p>Vertical axis</p> <p>Triangular proximal form with base towards cervix and apex towards incisal ridge</p> <p>Mesial contact area at incisal 3rd</p> <p>Straight labial outline with height of cervical 3rd</p> <p>Incisal ridge lingual to the long axis of root; crown shows lingual inclination over root</p> <p>Concavoconvex lingual outline</p> <p>Height of lingual contour at cervical 3rd on cingulum</p> <p>Cervical line curves incisally</p> <p>Lingual →</p>	 <p>← Labial</p> <p>Triangular proximal form</p> <p>Incisal ridge lingual to the root axis line</p> <p>Mesial contact area at incisal third nearer to incisal ridge</p> <p>Concavoconvex lingual outline</p> <p>Height of lingual contour at cervical 3rd on the cingulum</p> <p>Convex labial outline</p> <p>Height of labial contour at cervical 3rd</p> <p>Labiolingually broad root</p> <p>Lingual →</p>

Distal Aspect

Mandibular Central Incisor	Mandibular Lateral Incisor
<p data-bbox="326 486 458 518">← Lingual</p> <p data-bbox="1049 486 1166 518">Labial →</p>  <p data-bbox="919 682 1156 739">Distal contact area also at cervical 3rd</p> <p data-bbox="876 825 1156 882">Cervical line curvature less in extent</p>	<p data-bbox="1411 486 1544 518">← Lingual</p> <p data-bbox="2150 486 2267 518">Labial →</p>  <p data-bbox="1411 601 1717 722">Incisal ridge lingual to the root axis line because of slight lingual inclination of crown</p> <p data-bbox="1989 672 2270 793">Distal contact area also within incisal 3rd but cervically placed than mesial contact area</p> <p data-bbox="1997 811 2270 868">Cervical line on distal is less curved</p>

Incisal Aspect

Mandibular Central Incisor	Mandibular Lateral Incisor
 <p>← Mesial</p> <p>Distal →</p> <p>Oval incisal form</p> <p>More of labial surface seen due to lingual inclination of crown</p> <p>Crown bilaterally symmetrical</p> <p>Incisal ridge perpendicular to the labiolingual bisecting line</p> <p>Lingual fossa</p> <p>Cingulum</p> <p>Crown shows lingual convergence</p> <p>Labiolingual bisecting line</p>	 <p>← Mesial</p> <p>Distal →</p> <p>Labial</p> <p>Labiolingual bisecting line</p> <p>Oval incisal form</p> <p>Crown bilaterally asymmetrical appears twisted on root base</p> <p>Incisal ridge at an angle to the Labiolingual bisecting line</p> <p>La</p> <p>M</p> <p>D</p> <p>Li</p> <p>Labiolingual dimension greater than mesiodistal dimension</p> <p>Lingual</p>



Thank you

