Features of the anatomical structure of groups of teeth in the upper and lower jaws. Signs of teeth.

Dental formula

Milk bite

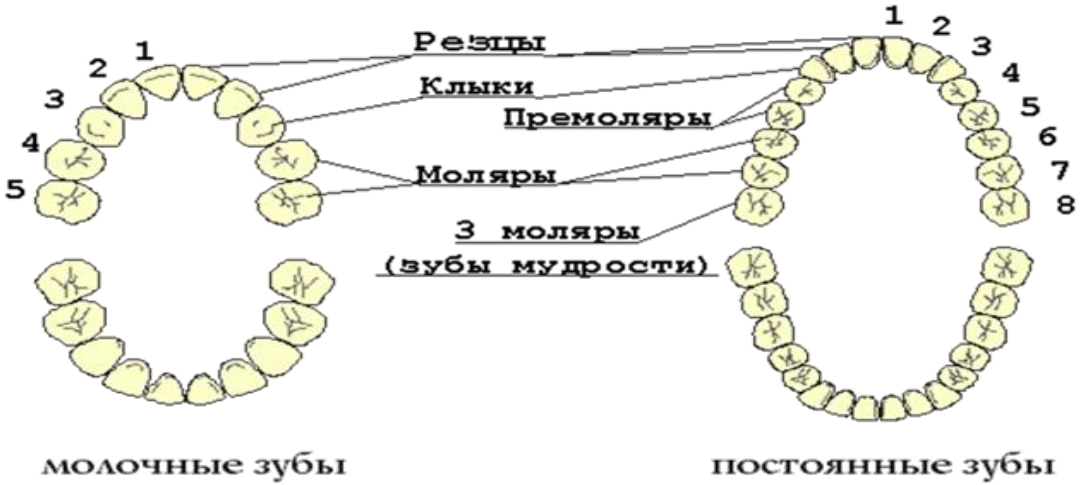
V IV III II I | I II III IV V

V IV III II I | I II III IV V

Постоянный прикус

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8

8 7 6 5 4 3 2 1 | 1 2 3 4 5 6 7 8



5.5	5.4	5.3	5.2	5.1	6.1	6.2	6.3	6.4	6.5
8.5	8.4	8.3	8.2	8.1	7.1	7.2	7.3	7.4	7.5

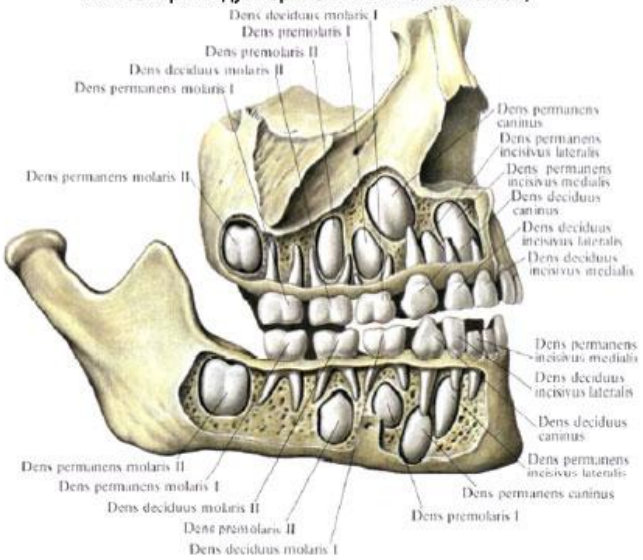
1								2							
1.8	1.7	1.6	1.5	1.4	1.3	1.2	1.1	2.1	2.2	2.3	2.4	2.5	2.6	2.7	2.8
4.8	4.7	4.6	4.5	4.4	4.3	4.2	4.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8
4								3							

For example, tooth 2.5 is the upper left fifth tooth;
4.6. – right lower sixth tooth

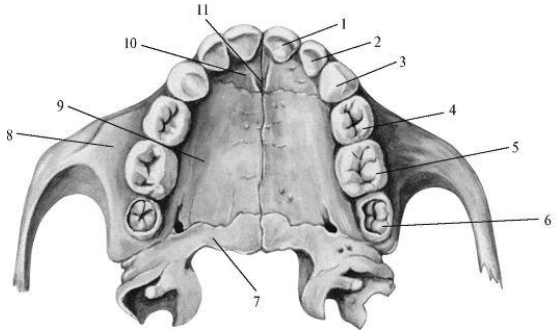
Timing of development and eruption of teeth (according to Kronfeld)

Teeth	Beginning of mineralization	Completion of enamel formation	Teethed teeth	The end of the formed roots	Start of resorption roots
I	From 4 months IV	By the 4th month p/r	6-8 months	1.5-2 years	From 4 years old
II	From 4.5 months IV	By the 5th month	8-10 months	1.5-2 years	From 5 years
III	From 5 months onwards	By the 9th month	16-20 months	4-5 years	From 8 years old
IV	From 5 months onwards	By the 6th month p / r	12-16 months	2.5-3.5 years	From 6 years old
V	From 6 months IV	By the 10-12th month of delivery	20-30 months	3-4 years	From 7 years old
1	From 3-4 months p/r	4-5 years	6-8 years	9-10 years	
2	From 3-4 months p/r	4-5 years	7-9 years	11 years	
3	From 4.5 months p/r	6-7 years	11-12 years old	13-15 years old	
4	From 1.5-2.5 years p/r	5-6 years	10-11 years	12-13 years old	

Лицевой череп ребенка 3 лет (удалена часть костной ткани альвеолярных дуг верхней и нижней челюстей)

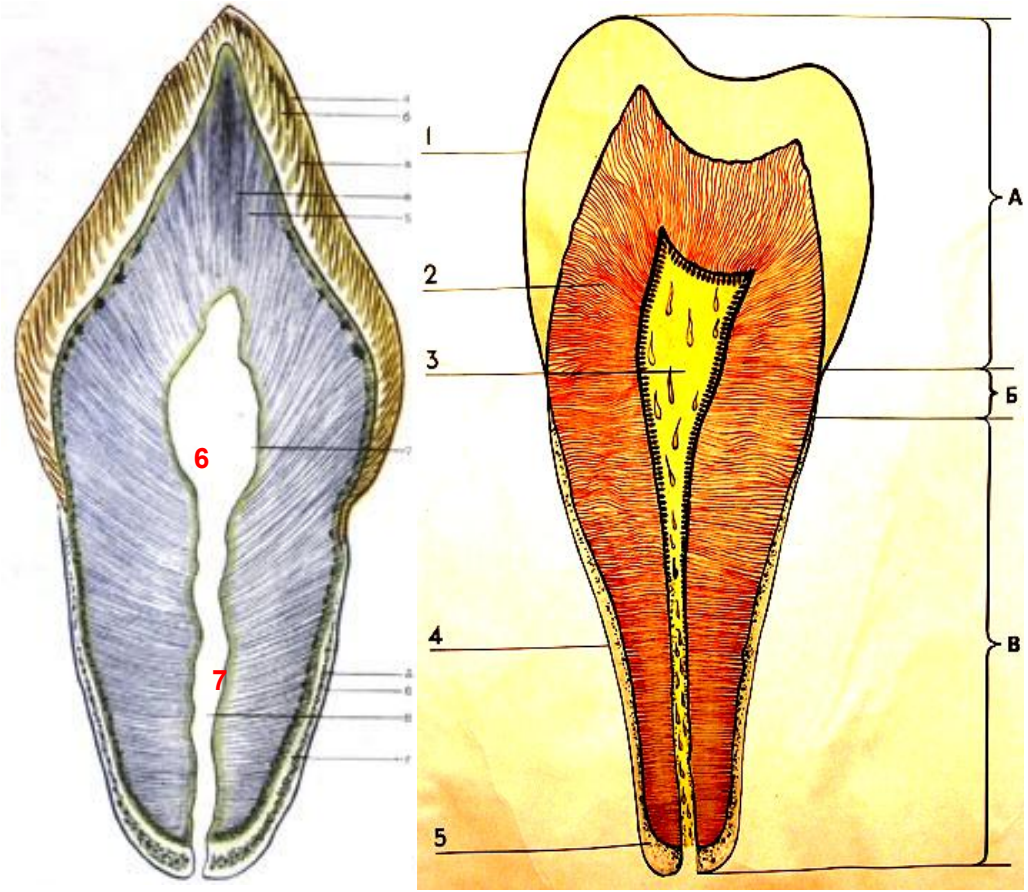


eatures of the structure of milk teeth



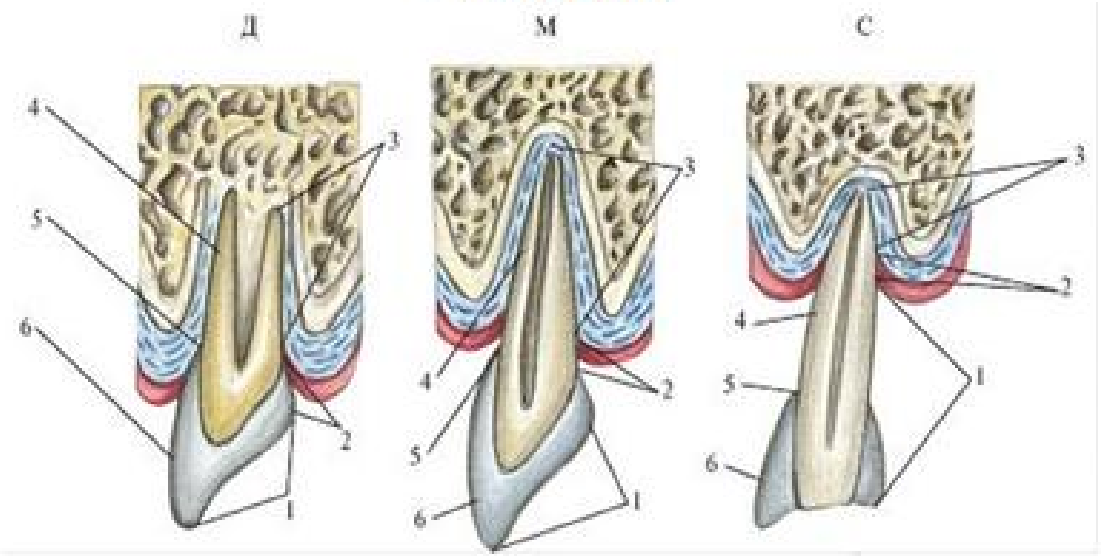
- *smaller sizes and numbers;*
- *the shape of the crown is more convex;*
- *the neck is well defined;*
- *“pincer-shaped” curved shape of the roots;*
- *blue shade of enamel;*
- *dentin is 2 times less than that of permanent teeth;*
- *large volume of pulp (the cavity of the crown and root canals is wider);*
- *the periodontium is looser;*
- *the periodontal space is wider than that of permanent teeth*

Macroscopic structure of the tooth



A- crown
B- neck
B-root
1- enamel
2- dentin
3- pulp
4- cement
5- top tooth root
6-pulp camera
7-pulp channel
8- apical hole

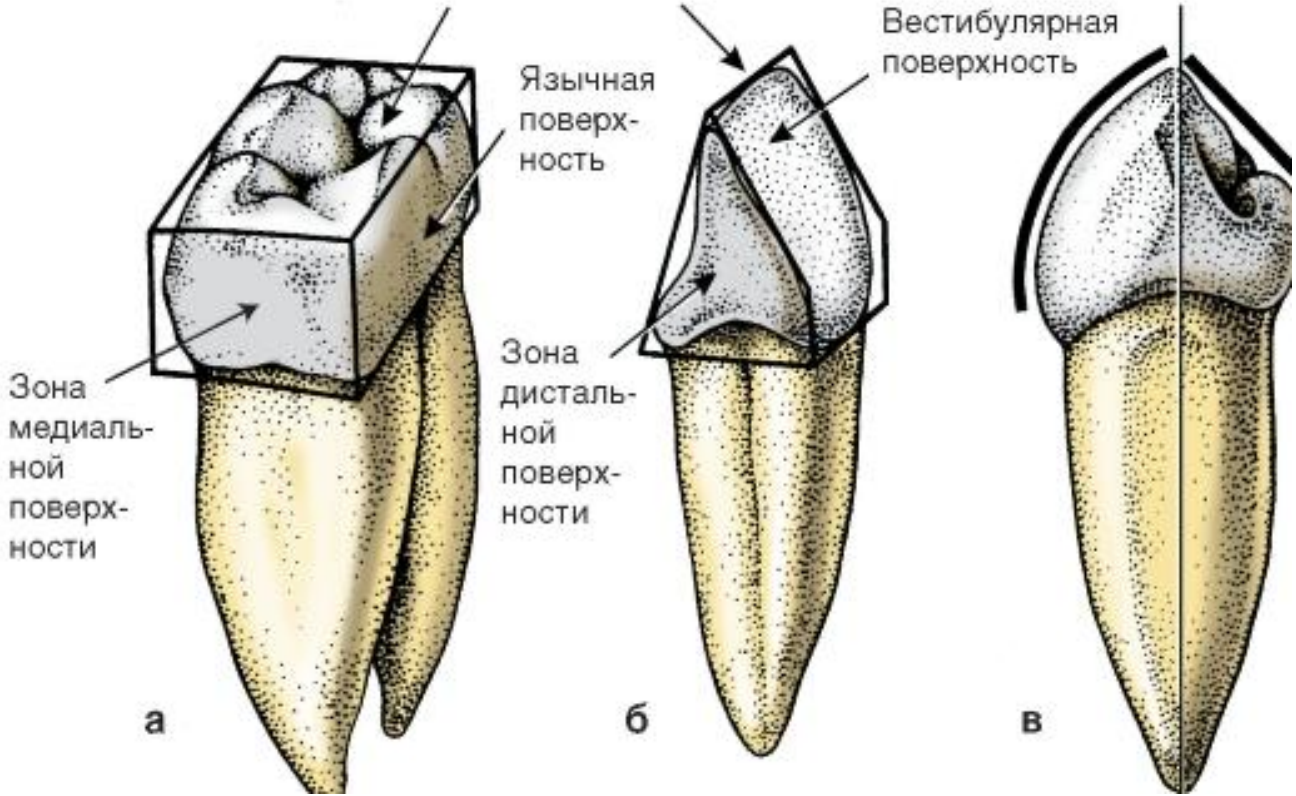
Анатомическая и клиническая коронка, корень и шейка зуба в различные возрастные периоды человека



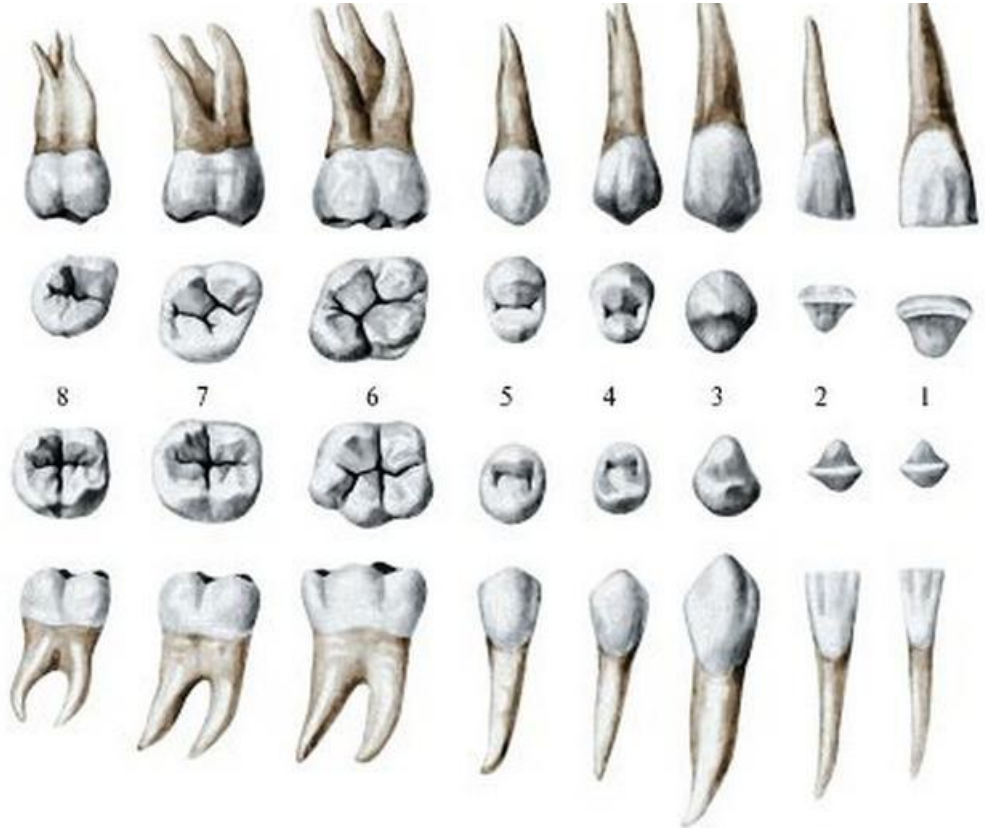
Д - детский возраст, М - первый зрелый возраст, С - старческий возраст.
1 - клиническая коронка, 2 - клиническая шейка, 3 - клинический корень, 4 - анатомический корень, 5 - анатомическая шейка, 6 - анатомическая коронка.

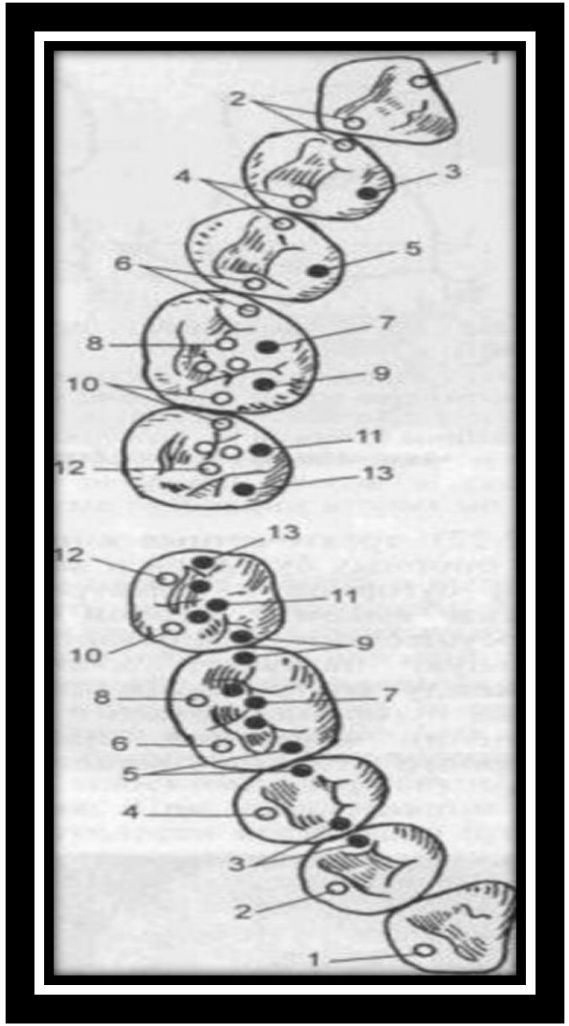
Tooth surfaces

Closing surface (occlusal, chewing, cutting edge)

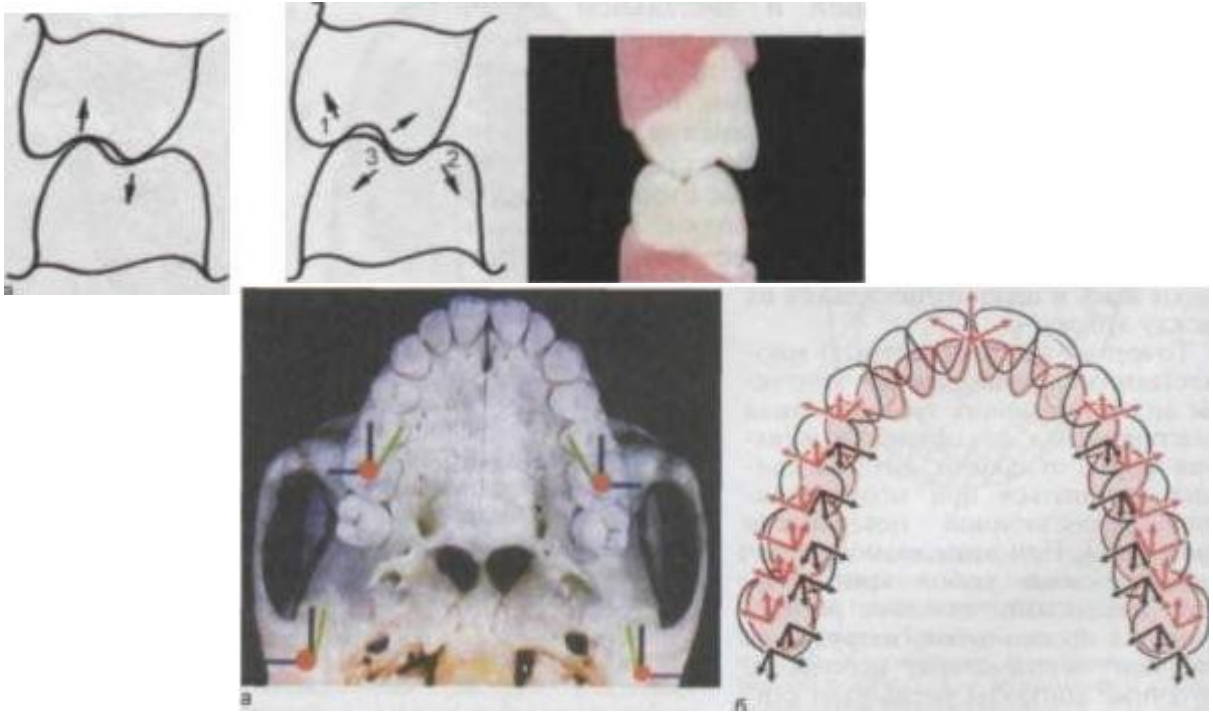


Vestibular surface, incisal edge or occlusal surface



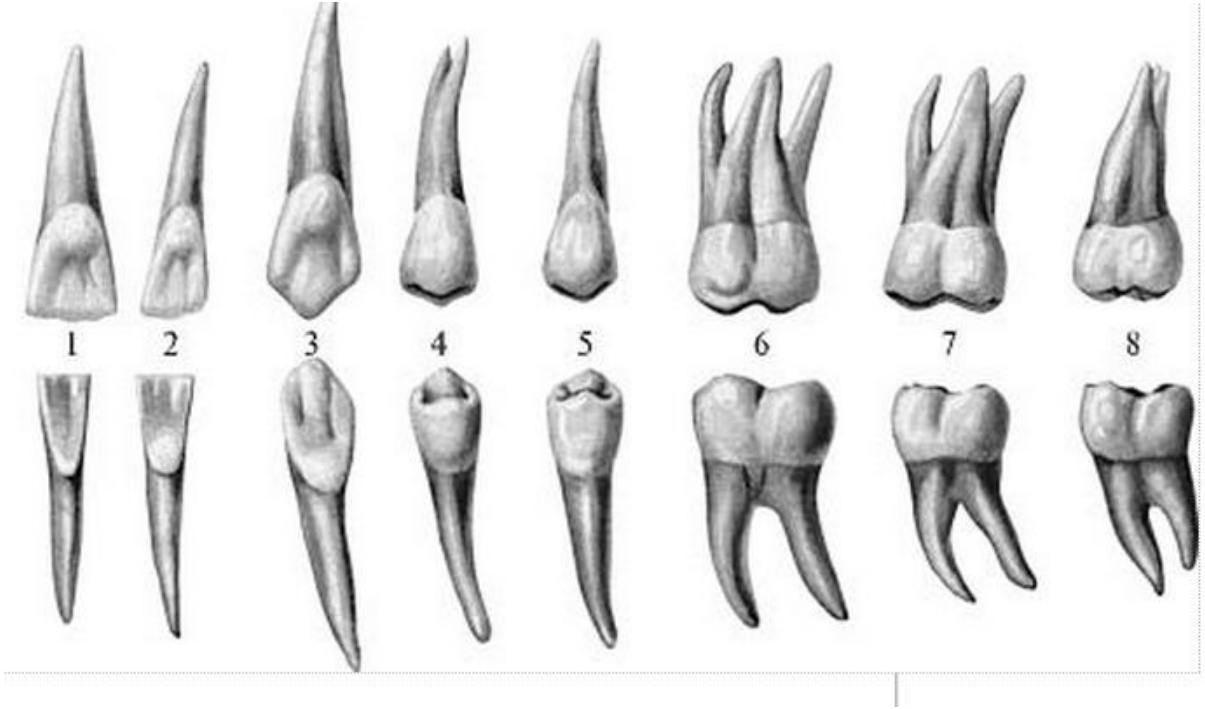


Rice. Point occlusal contacts of the cusps and fissures of the teeth of the upper and lower jaws.
The circles are the supporting buccal cusps of the lower teeth and the corresponding contacts with the teeth of the upper jaw; black dots are the supporting palatal cusps of the upper teeth and corresponding contacts with the teeth of the lower jaw.

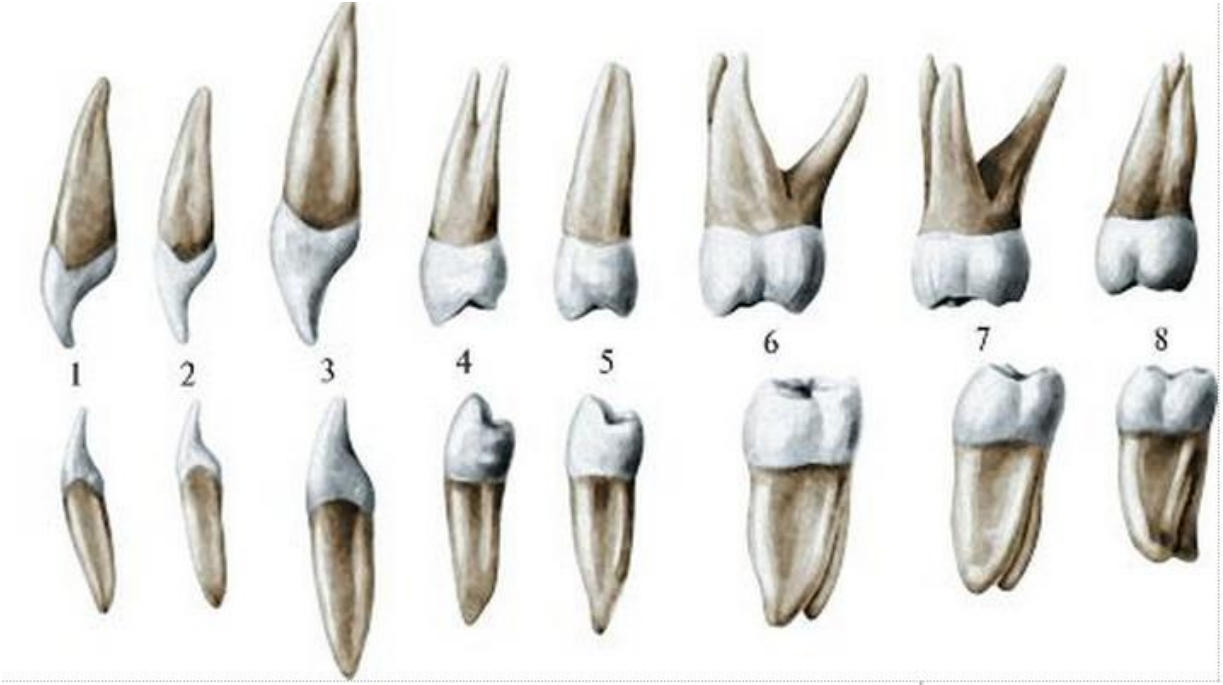


Rice. Three options for the relationship between tubercles and fossae in the position of central occlusion.
a - “free central occlusion”; b — point contacts of the slopes of the tubercles; c - “lingualized occlusion.”
Rice. Trajectories of the main movements of the lower jaw

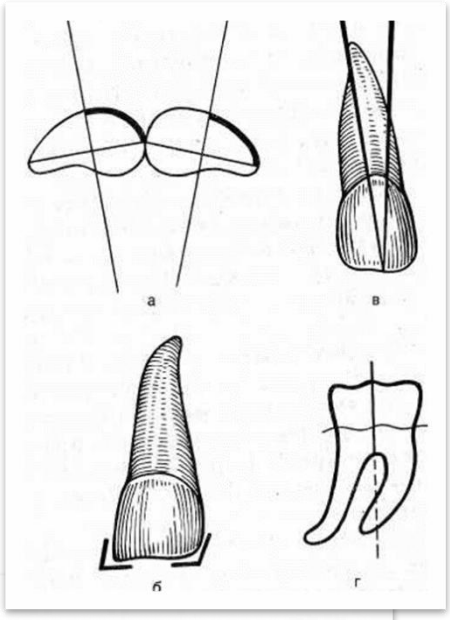
Lingual (l ingual) surface

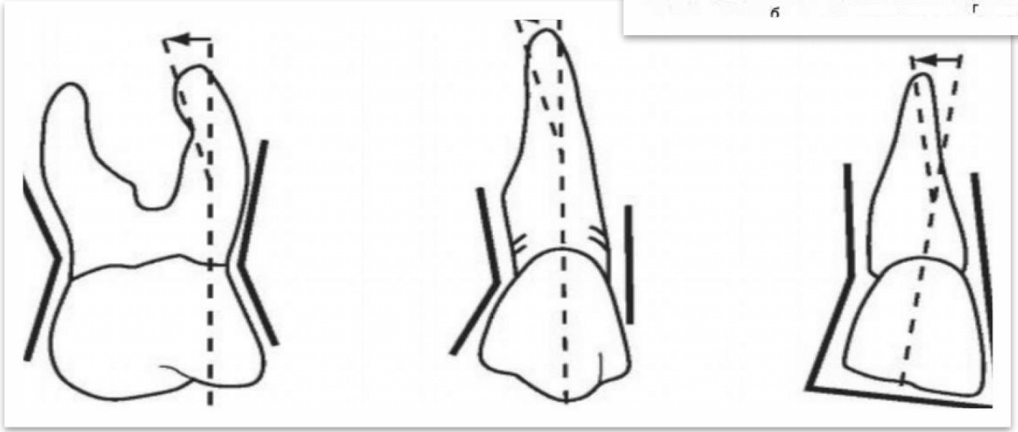


Medial surface



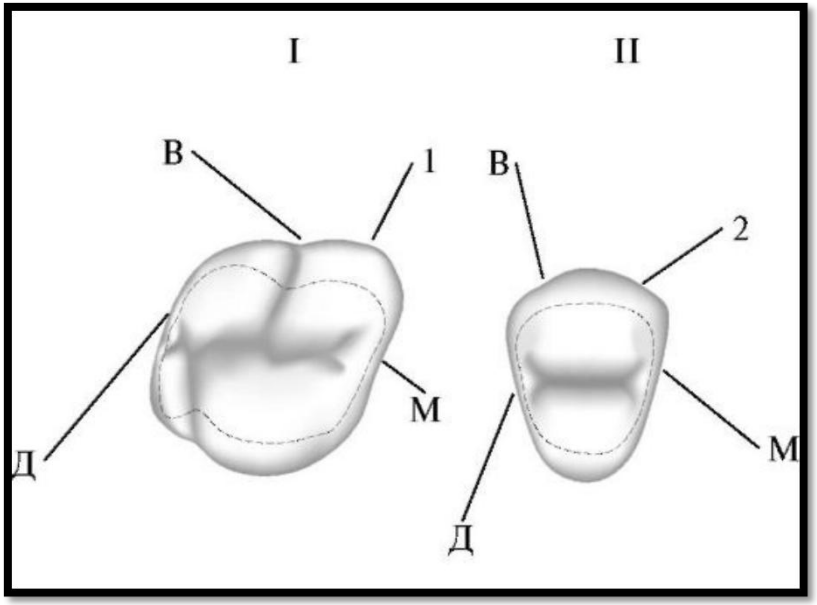
Sign of crown curvature
Crown angle sign
Tooth root sign





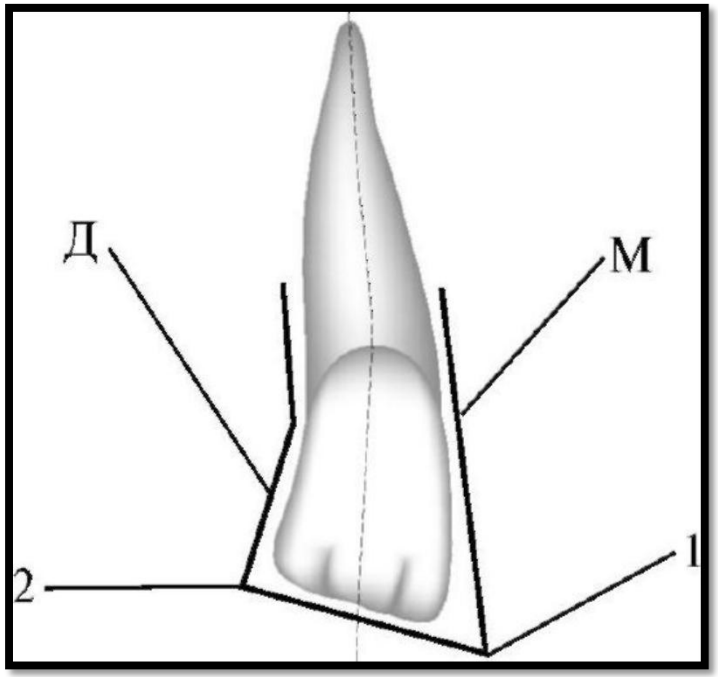
A sign of curvature of the crown enamel -

the enamel on the vestibular surface of the tooth is thicker medially than distally



(using the example of the upper molar - I and the upper premolar - II).
1 - positive sign, 2 - negative sign.
D - distal surface, M - mesial surface,
B - vestibular surface.

Crown angle sign and root sign

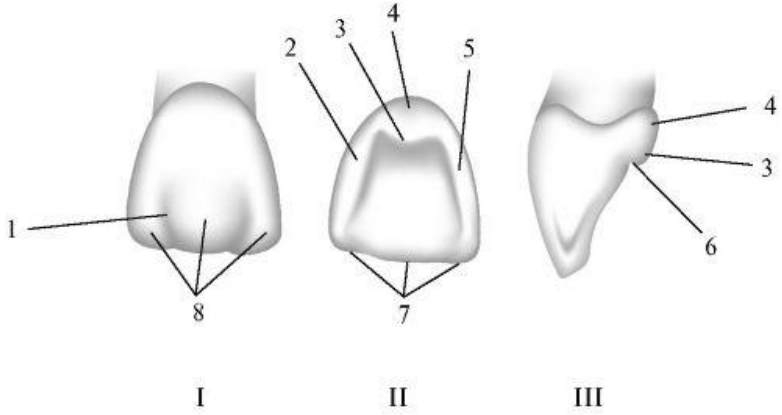


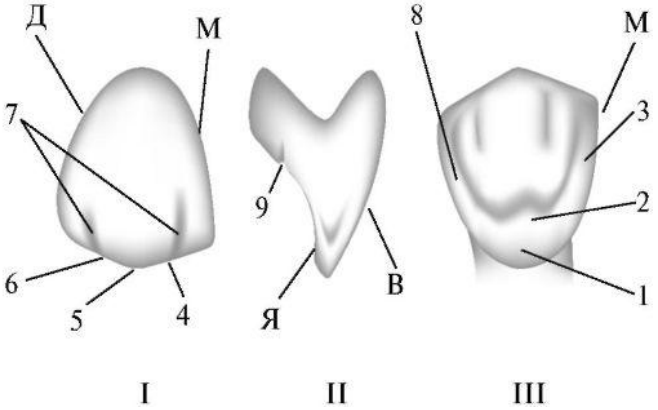
The mesio-occlusal angle is sharper than the occlusal-distal angle.

The axis of the tooth is deflected distally with respect to the longitudinal axis of the tooth.

1 - mesio-occlusal angle,
2 - occlusal-distal angle, 3 - tooth axis.
D - distal surface,
M – mesial surface.

Incisors (dentes incisivi)

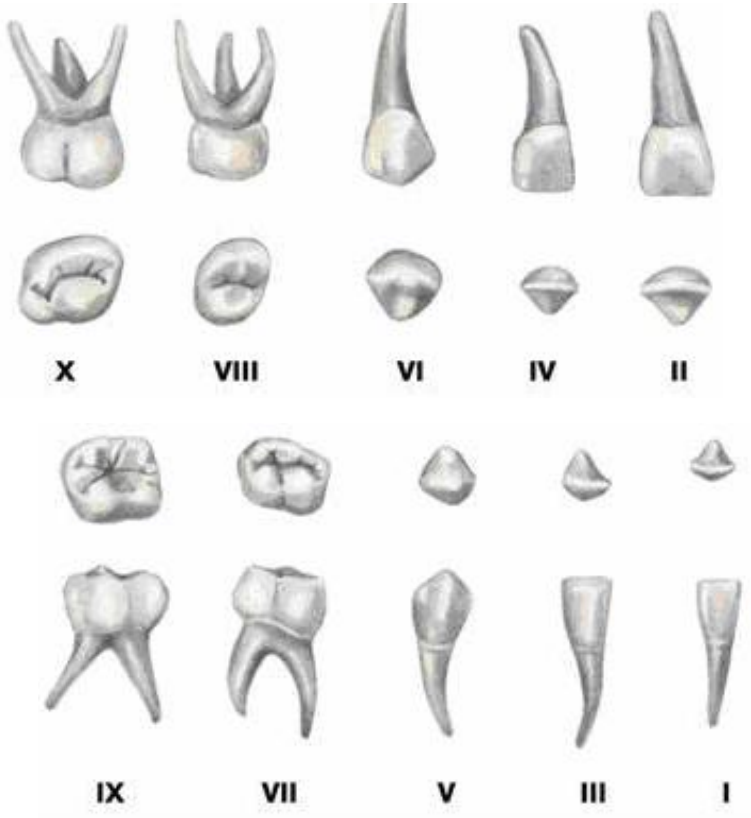




Canines (dentes canini)

Age-related characteristics of teeth

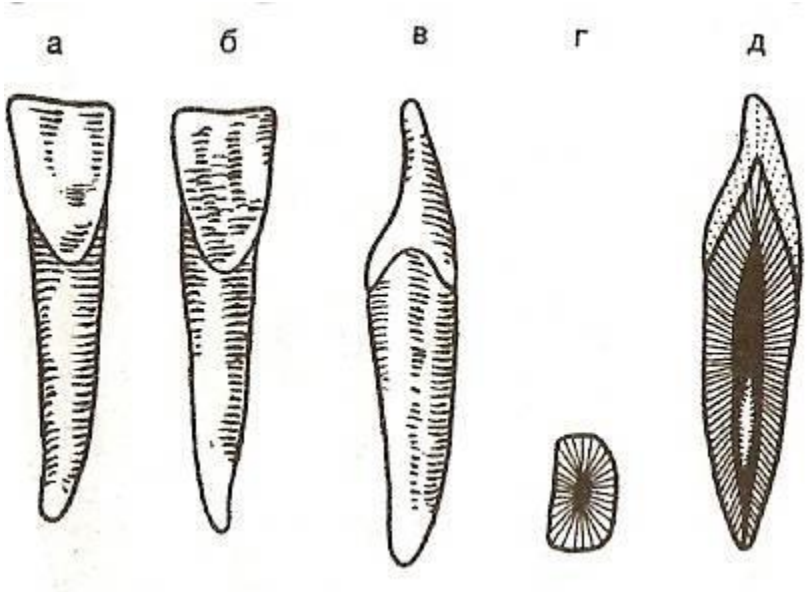
- *Gradual wear of tooth enamel;*
- *Formation of enamel microcracks;*
- *Reduction of the tooth cavity due to dentin growth;*
- *Thickening of the walls of pulp vessels and decreased trophism of tooth tissue;*
- *Thickening of the cementum of the tooth;*
- *Changes in the thickness of periodontal fascicles*



Central and lateral incisors of the maxilla.

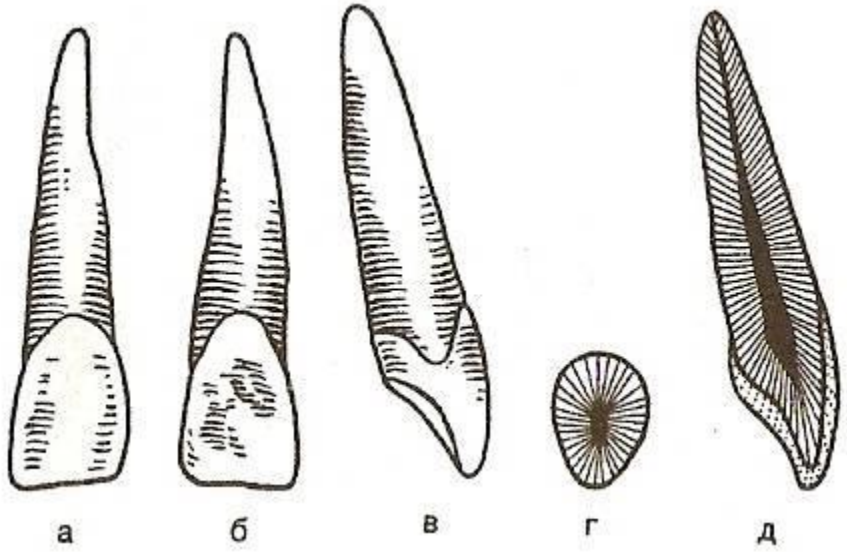
Central incisors of the upper jaw.

The average length of the central incisor is 25 mm (22.5 – 27.5 mm). It always has 1 direct root and 1 channel. The greatest expansion of the cavity is observed at the level of the tooth neck. The axis of the tooth runs along the cutting edge.



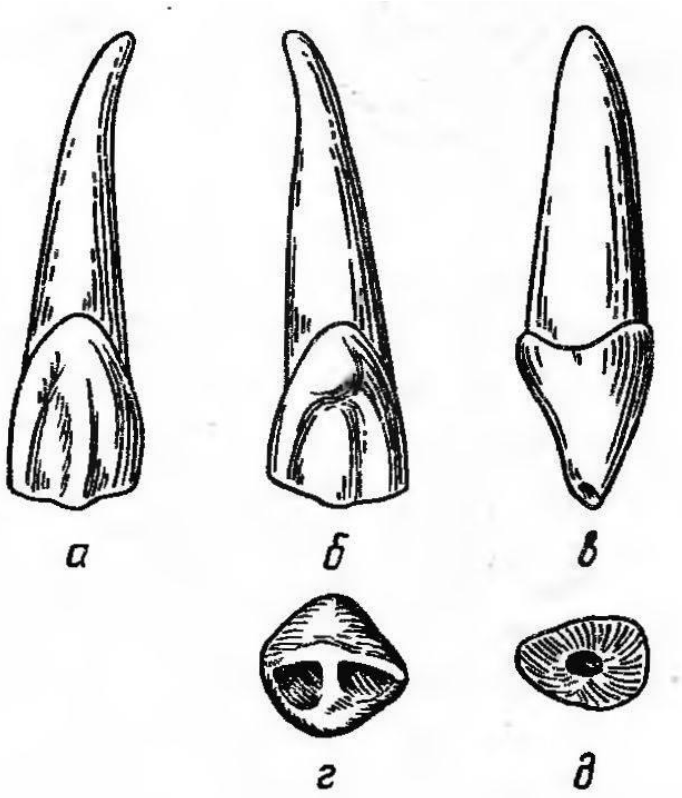
Lateral incisors of the maxilla.

The average length of the lateral incisor is 23 mm (21 – 25 mm). There is always one root and one channel. In most cases, the root has a distal bend.



Canines of the upper jaw.

The average canine length is 27 mm (24 – 29.7 mm). This is the longest tooth. A canine always has one root and one canal. In most cases (89%), the root is straight, but has a pronounced labial extension. As a result, the root has an oval shape. The apical narrowing is weakly expressed, which makes it difficult to determine the working length of the tooth.



First premolars of the maxilla.

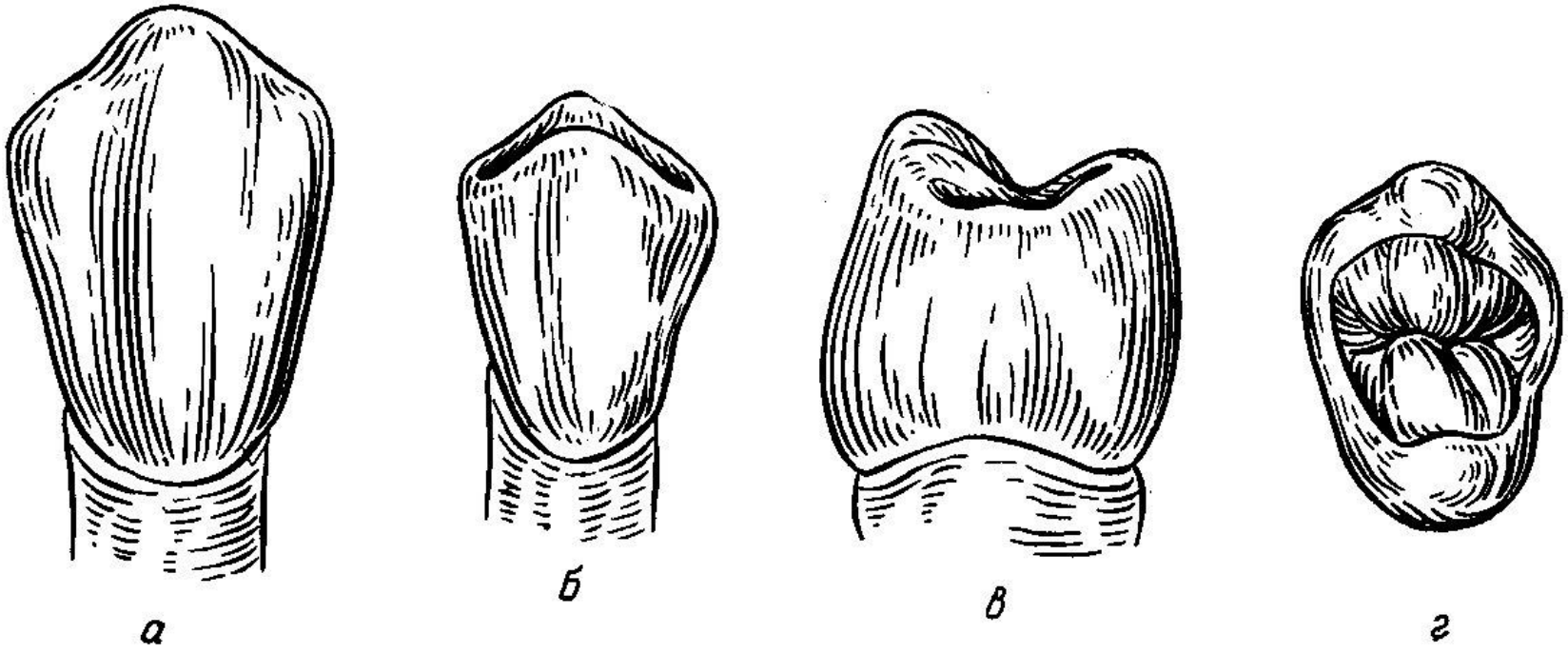
The average length of the first premolar is 21 mm (19 – 23 mm). There are different variations in the number of roots and canals of these teeth:

- 2 roots and 2 canals, with this variation accounting for 72% of cases;
- 1 root and 1 canal, in 9% of cases;
- 1 root and 2 canals, in 13% of cases;
- 3 roots and 3 canals, in 6% of cases.

Distal root bending is observed in 37% of cases. The tooth cavity passes

in the bucco-palatal direction and is located deep at the level of the neck of the tooth, that is, covered with a thick layer of dentin. The mouths of the canals are funnel-shaped, which ensures free entry into the canal or canals when the tooth cavity is properly opened.

Maxillary first premolars



Maxillary second premolars.

The average length of the second premolar is 22 mm (20 – 24 mm).

75% of this group of teeth have 1 root and 1 canal.

2 roots and 2 channels – 24%.

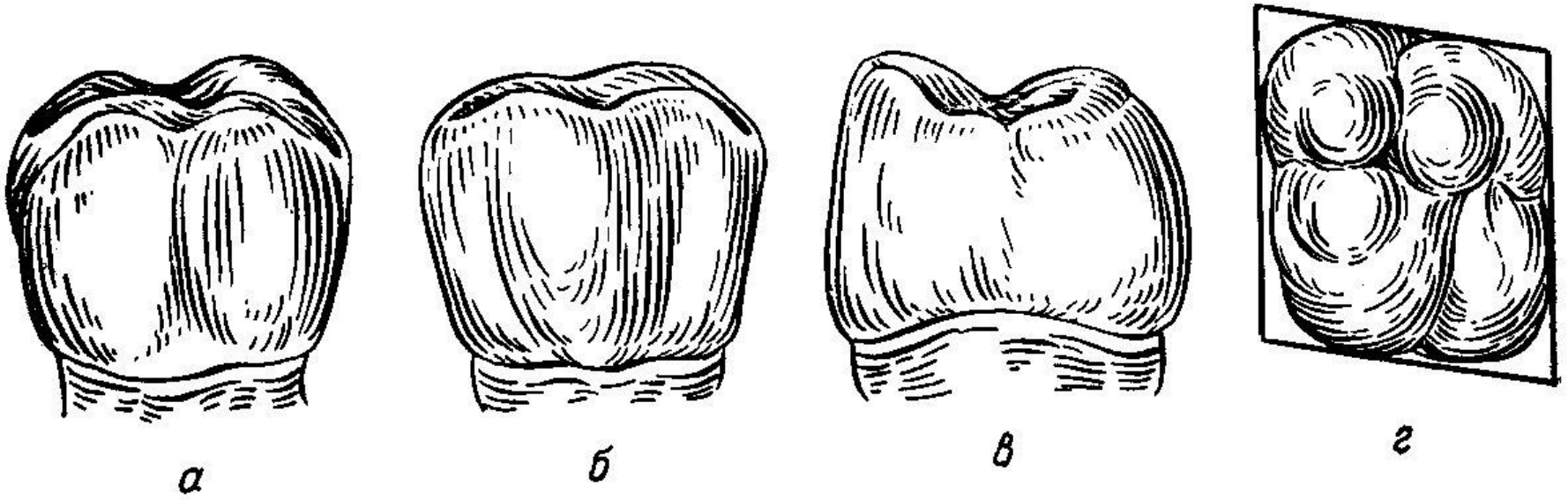
3 roots and 3 channels – 1%.

It is known that this tooth has 1 root and 1 canal, but, as a rule, there are two orifices, and the canals are connected and open with one apical foramen. Two holes are observed in 25% of this group of teeth, according to studies by a number of authors. The tooth cavity is located at the level of the neck, the canal has a slit-like shape.

First molars of the maxilla.

The average length of the first molar is 22 mm (20 – 24 mm). It should be noted that the palatal root is in most cases longer, and the distal root is shorter. It is generally accepted that a tooth has 3 roots and 3 canals. In fact, in 45 - 56% of cases it has 3 roots and 4 canals, and in 2.4% of cases it has 5 canals. Most often there are 2 channels - in the buccal-mesial direction. The tooth cavity resembles a rounded quadrangle in shape and is larger in the bucco-palatal direction. The slightly convex bottom of the tooth cavity is located at the level of the neck. The mouths of the canals are located in the middle of the corresponding roots in the form of minor extensions. The orifice of the fourth additional canal, if present, is located along the line that connects the orifices of the anterior buccal and palatine canals. The mouth of the palatine canal is easily determined, but the rest are difficult to determine, especially the additional one. With age, replacement dentin is deposited on the roof of the tooth cavity to a greater extent, and on the bottom and walls of the cavity to a lesser extent.

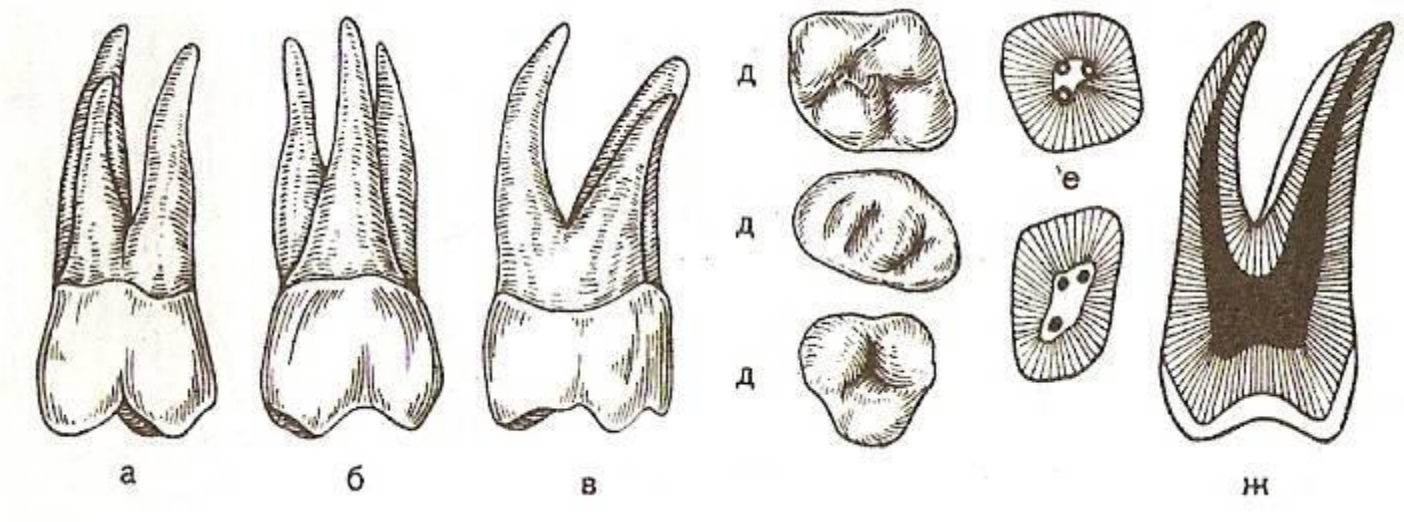
First molars of the maxilla.



Maxillary second molars.

The average length of the maxillary second molars is 21 mm (19 – 23 mm).

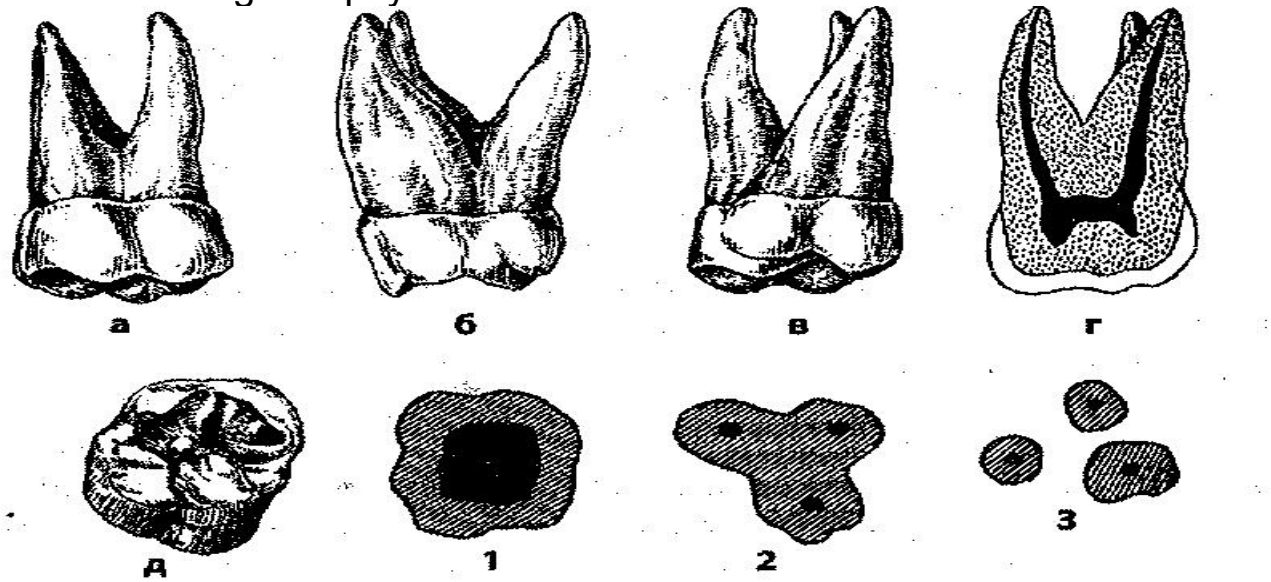
In 54% of cases, the tooth has 3 roots, and in 46% of cases, 4 roots. In most cases, the roots have a distal curvature. Two canals, usually in the anterior buccal root. Possibly also fusion of roots.



Maxillary third molars.

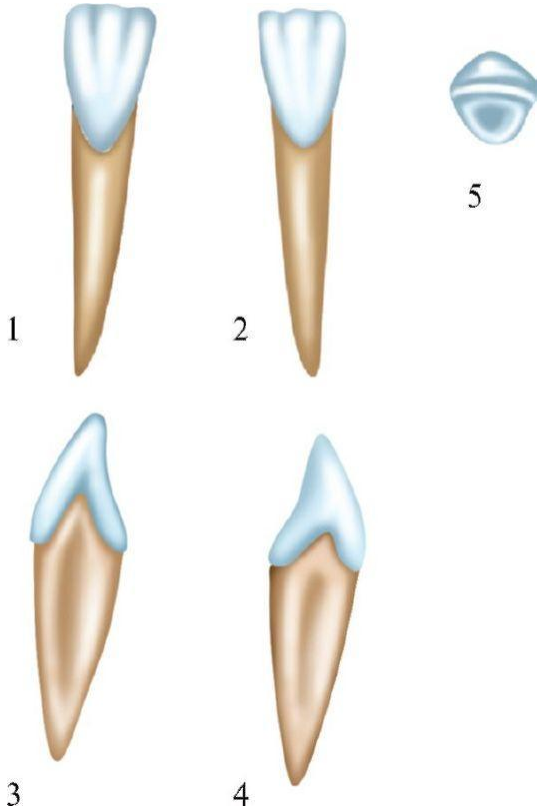
This tooth has a large number of anatomical variations.

Most often there are 3 or more roots and canals. However, 2, and sometimes 1 root and canal can be observed. In this regard, the anatomy of the cavity of this tooth is unpredictable and its features are determined during autopsy.



Central incisors of the lower jaw.

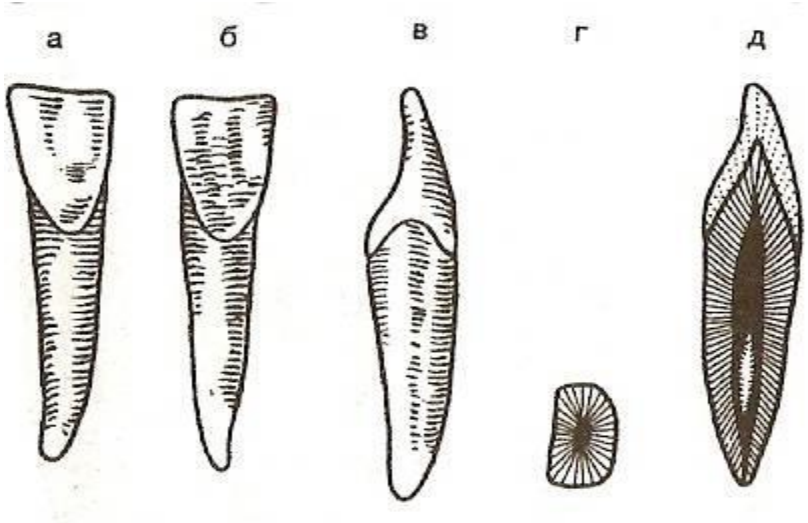
The average length of the central incisors is 21 mm (19 – 23 mm). 1 canal and 1 root are present in 70% of cases, 2 canals in 30% of cases, but in most cases they end in one hole. Most often, the root is straight, but in 20% of cases it may have a curvature towards the distal or labial side. The canal is narrow, its largest size is in the labio-lingual direction.



Lateral incisors of the lower jaw.

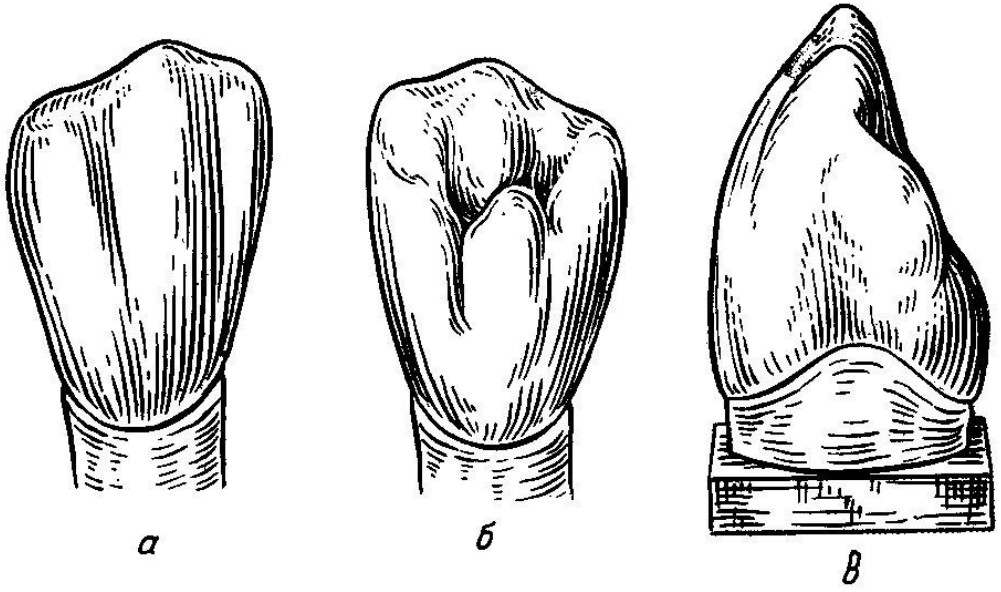
The average length is 22 mm (20 – 24 mm). In 57% of cases, the tooth has 1 root and 1 canal. In 30% of cases there are 2 canals and 2 roots. In 13% of cases there are 2 converging channels ending in one hole.

A peculiarity of the mandibular incisors is the fact that on radiographs the canals overlap each other and, as a result, are often not identified.



Canines of the lower jaw.

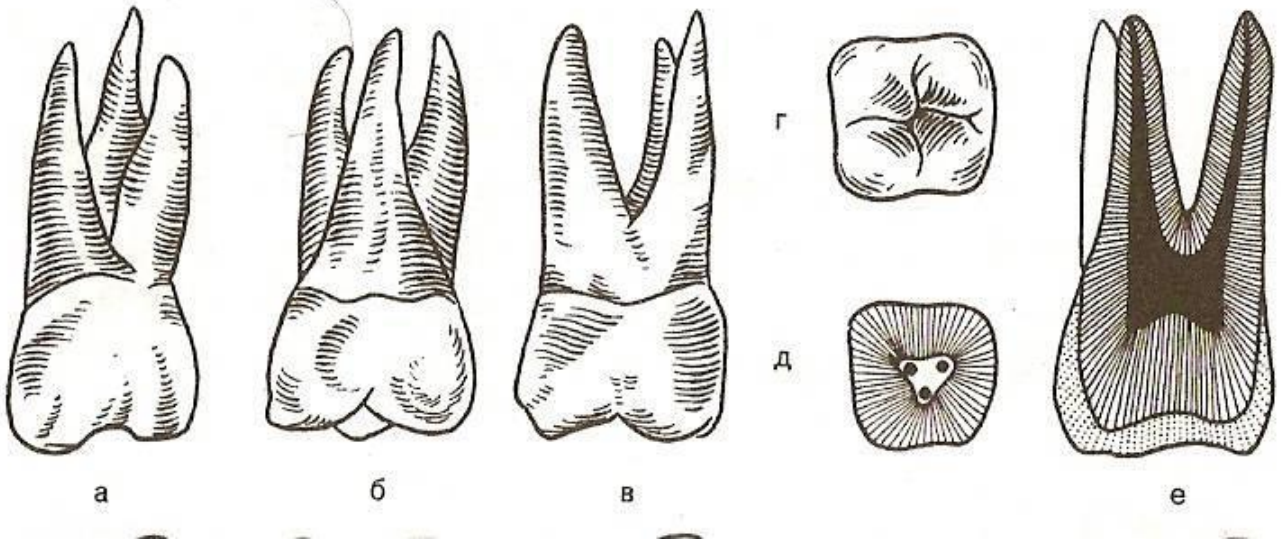
The average length of the fangs is 26 mm (26.5 – 28.5 mm). Usually they have 1 root and 1 channel, but in 6% of cases there may be 2 channels. Deviation of the root apex to the distal side was noted by researchers in 20% of cases. The channel has an oval shape and is well passable.



First premolars of the mandible.

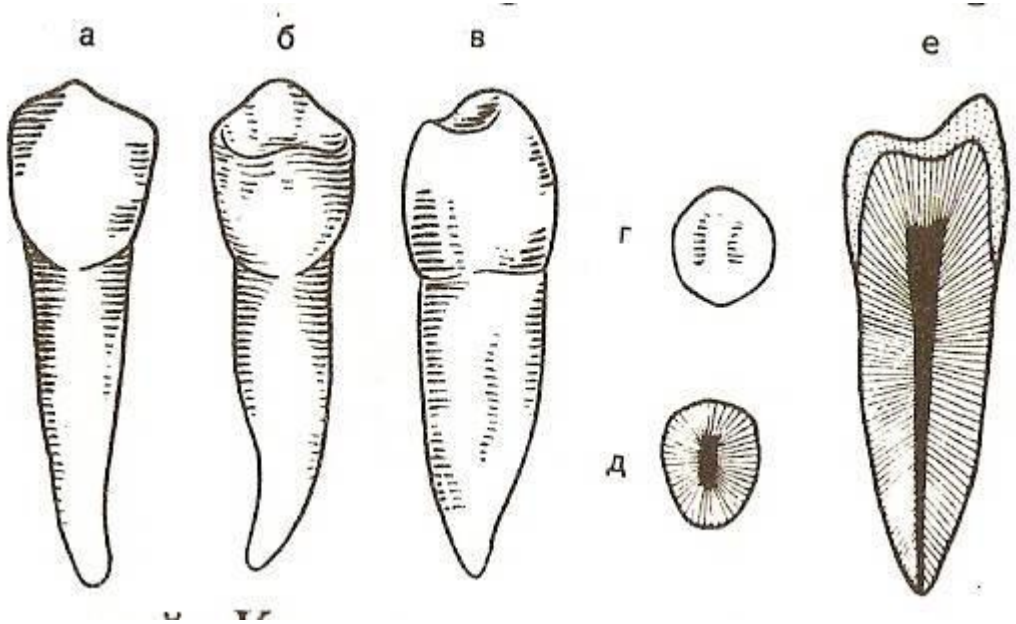
The average length of the first premolar corresponds to 22 mm (20 – 24 mm).

A tooth usually has 1 root and 1 canal. In 6.5% of cases, the presence of 2 converging canals is noted. In 19.5% of cases, 2 roots and 2 canals are noted. The largest size of the tooth cavity is observed below the neck. The root canal has an oval shape and ends with a pronounced narrowing. Most often. the root has a distal deviation.



Mandibular second premolars.

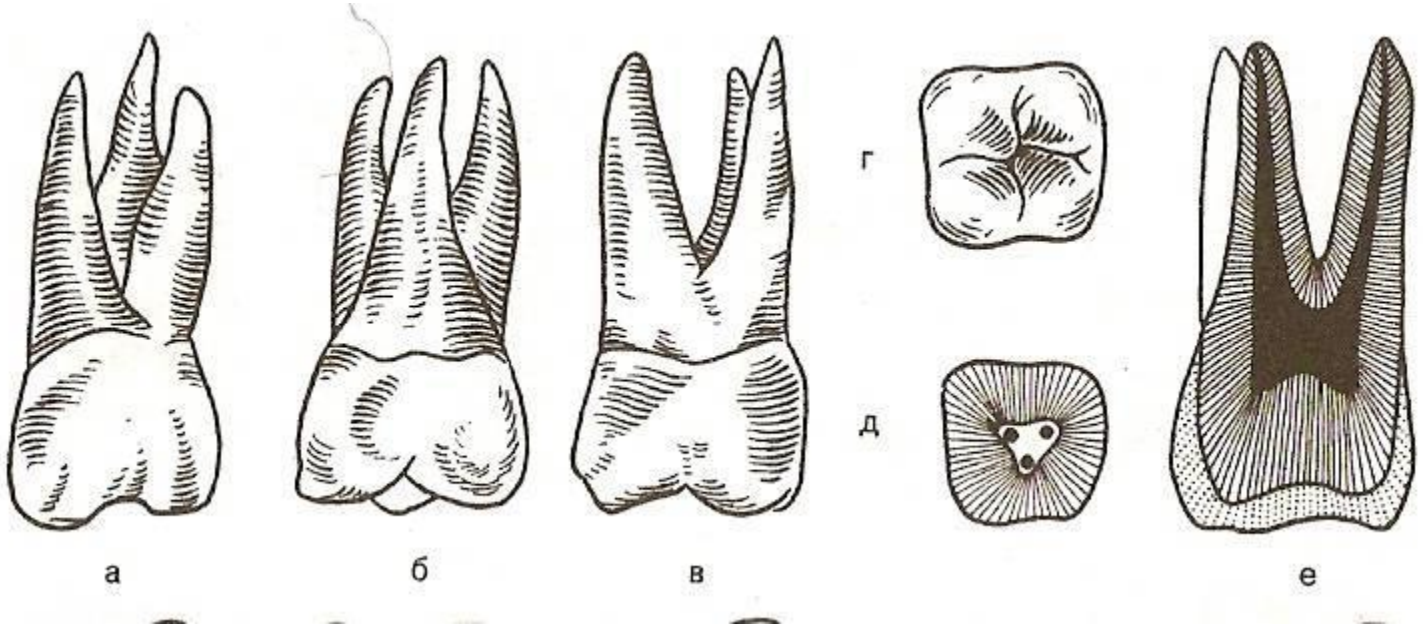
The average length is 22 mm (20 – 24 mm). Teeth have 1 root and 1 canal in 86.5% of cases. In 13.5% of cases there is a variation with 2 roots and 2 canals. The root has a distal deviation in most cases.



First molars of the mandible.

The average length of the first molars is 22 mm (20 – 24 mm). In 97.8% they have 2 roots. In 2.2% of cases there is a variation with 3 roots with a bend in the lower third. The single distal canal has an oval shape and is well passable. In 38% of cases there are 2 channels. There are 2 canals in the mesial root, but in 40–45% of cases they open with one hole. The tooth cavity is largest in the mesial direction and is displaced in the mesial-buccal direction, as a result of which the orifices of the mesial root often do not open (in 78% of cases). The bottom of the cavity is slightly convex, located at the level of the neck of the tooth. The mouths of the canals form an almost isosceles triangle with an apex at the distal root, although the tooth cavity has the shape of a rounded quadrangle. The mesial canals are narrower, especially the anterior buccal, which creates difficulties for treatment, especially in elderly patients. In some cases, the branches of the root canals form a dense network.

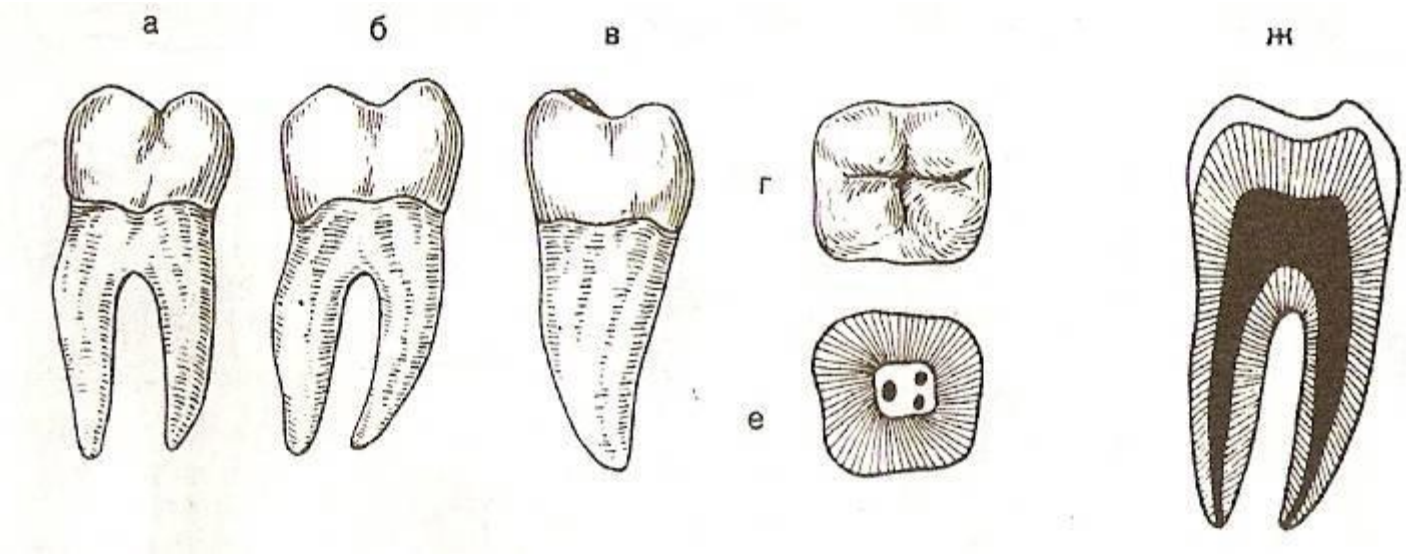
First molars of the mandible.



Mandibular second molars.

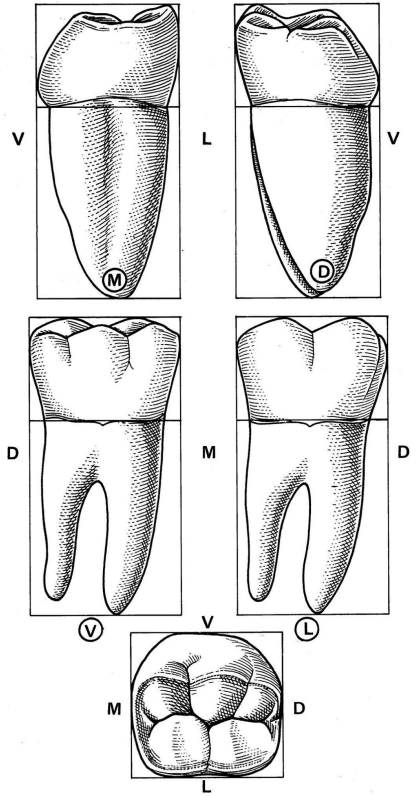
The average length of these teeth is 21 mm (19 – 23 mm). They usually have 2 roots and 3 canals. In the mesial root, the canals may merge at its apex. This is observed in 49% of cases. The mesial root is clearly curved in the distal direction in 84% of cases, and the distal root is straight in 74% of cases. There is evidence of the fusion of mesial and distal roots. This anatomical variation is observed in 8% of cases. The tooth cavity has the shape of a rounded quadrangle and is located in the center.

Mandibular second molars.



Mandibular third molars.

Their average length is 19 mm (16 – 20 mm). The shape of the crown of these teeth, like the anatomy of the roots, is unpredictable. There may be many roots and canals that are short and crooked.



Mandibular third molars.

Based on the general characteristics of the teeth, their belonging to a certain side of the jaw is determined. The main three signs are:

- a sign of the crown angle, expressed in a greater acuteness of the angle between the cutting edge or chewing surface and the mesial surface compared to another angle between the cutting edge or chewing surface and the distal surface of the tooth;
- a sign of crown curvature, characterized by a steep curvature of the vestibular surface at the mesial edge and a gentle slope of this curvature to the distal edge;
- a sign of root position, characterized by deviation of the root distal to the longitudinal axis of the coronal part of the tooth.

Three signs of teeth.

1. A sign of curvature of the crown enamel. It manifests itself in the fact that the convexities of the buccal and labial surfaces of the crowns are not the same. In the crowns of the frontal group of teeth they are shifted to the midline. Consequently, the medial part of the crown is more convex than the lateral part. In the chewing group of teeth, the anterior part of the buccal surface is more convex and the posterior part is less convex. Briefly, we can say that this sign is manifested in the fact that the greatest convexity of the vestibular (labial or buccal) surface is located medially.

Three signs of teeth.

2. Crown angle sign. Associated with the anatomical feature of tooth crowns. It manifests itself in the fact that the angle formed by the medial surface and the cutting edge of the front teeth turns out to be sharper than the angle formed by the lateral surface and the cutting edge. The same applies to the chewing group of teeth, in which the angle formed by the front and chewing surfaces turns out to be more acute than the opposite angle of the crown.

Three signs of teeth.

3. Root sign. It is determined in the position of the tooth in the vestibular norm. It consists in the fact that the apices of the roots of the incisors and canines deviate from the midline in the lateral direction, and those of the premolars and molars - in the posterior direction from the longitudinal axis of the root. Allows you to determine the side of the tooth by the direction of deviation of the longitudinal axis of the tooth.