

Cementum

Is a mineralized connective tissue resembling bone, that covers the root of the teeth and serves to anchor gingival and periodontal fibers. Some types of cementum may also form on the surface of the enamel of the crown. Unlike bone, cementum is not vascular and exhibits little turnover. Cementum grows slowly, by surface apposition, throughout life.

The major function of cementum is the anchorage of teeth to the adjacent alveolar bone via periodontal ligament. However, it serves other functions as well. Cementum is less susceptible to resorption than dentin. Although it can be resorbed, it serves as protective layer over the dentin. Continuous deposition of cementum in the apical region compensates for rapid wear at the occlusal surface.

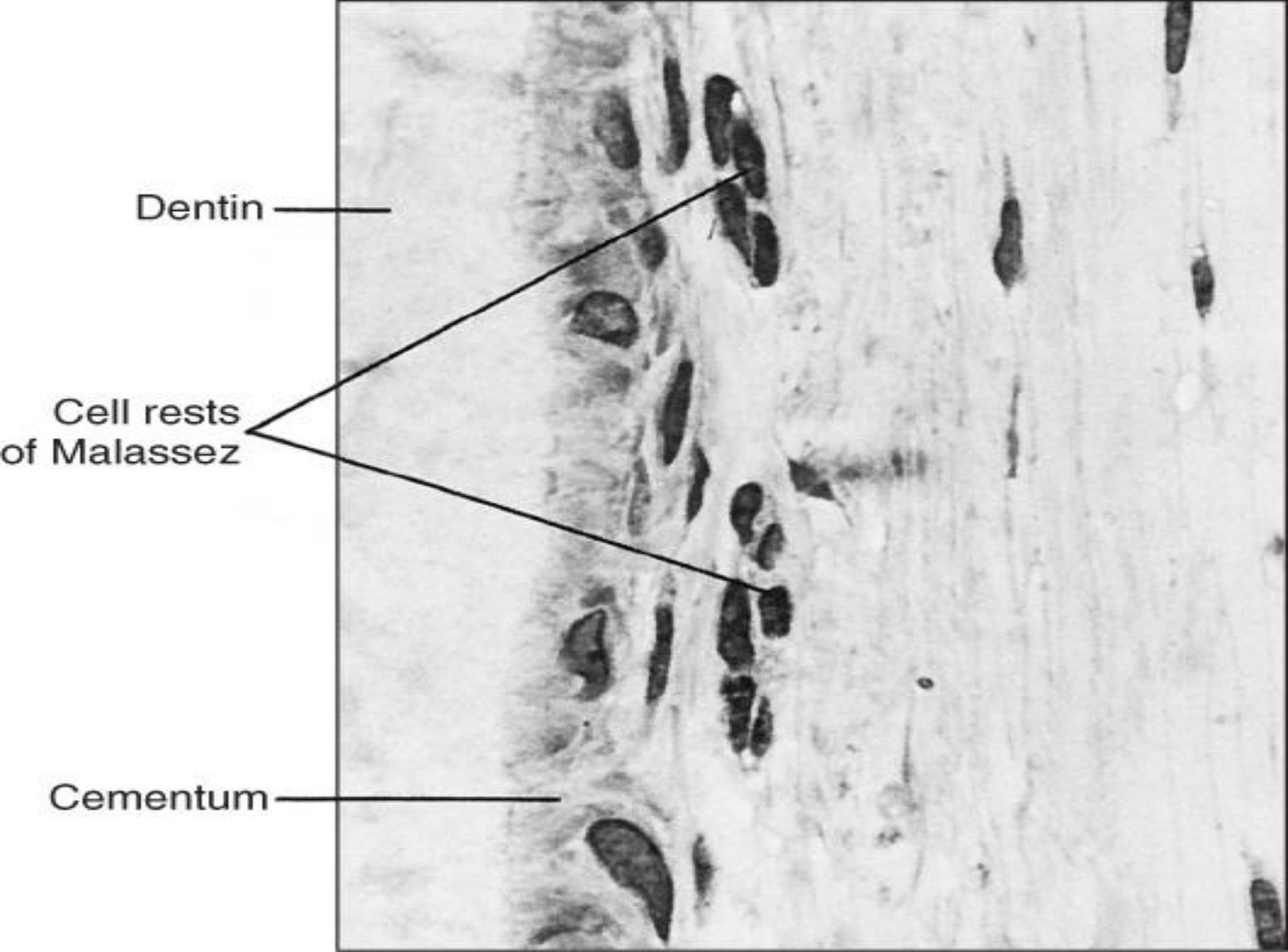


Enamel

Dentin

Pulp

Cementum



Dentin

Cell rests
of Malassez

Cementum

There are three arrangement of junction between cementum and enamel .

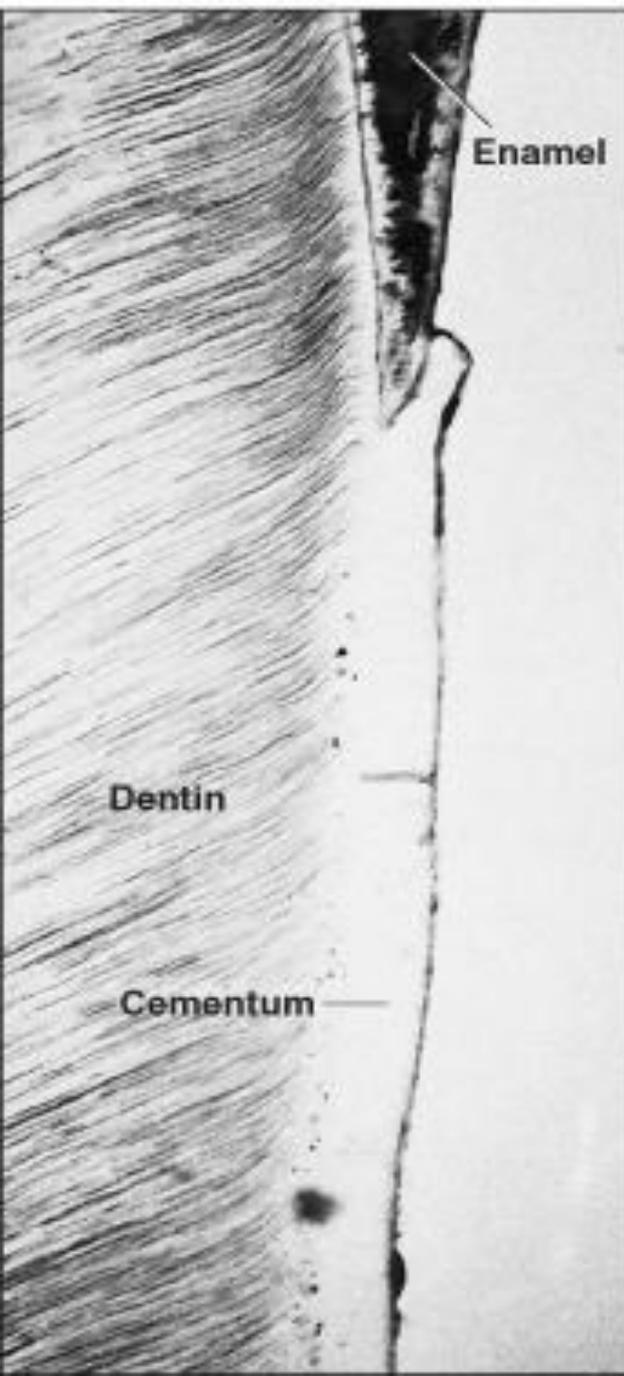
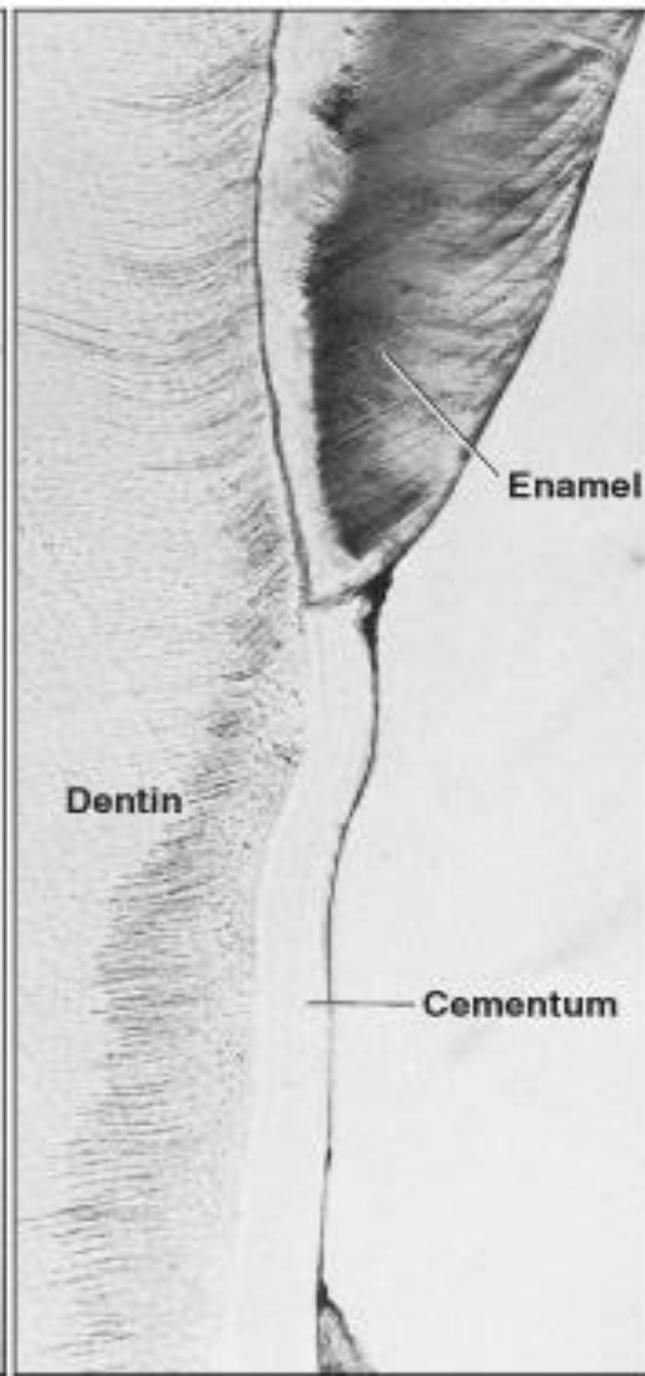
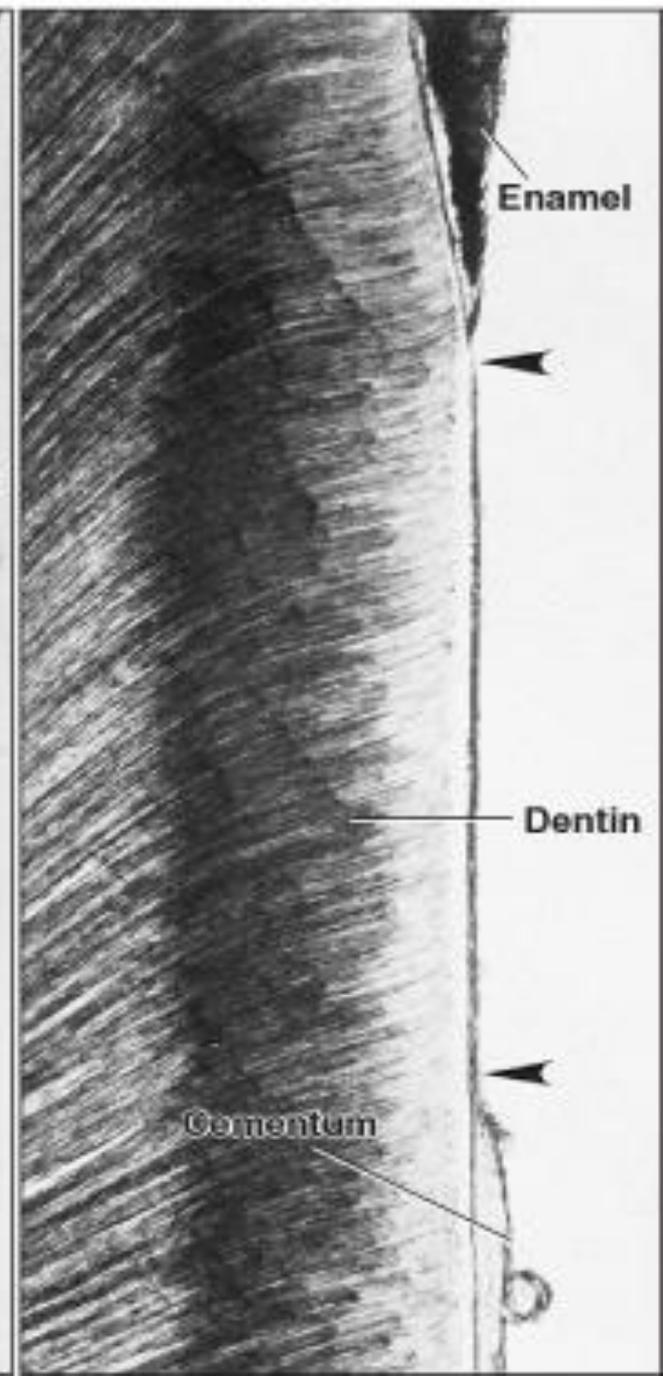
Pattern 1: where the cementum overlaps for a short distance, it is the most common, occupies 60% of the sections.

Pattern 2: where cementum and enamel meet at a butt joint, occurs in 30% of the sections.

Pattern 3: where the cement and enamel fail to meet and separated by gap with exposed dentin, occur in 10% of sections.

Physical properties:

1. Cementum is pale yellow with dull surface.
2. It is softer than dentin and it is thinnest cervically.
3. Cementum can be loss by abrasion, leading to exposed dentin.

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Chemical properties:

Cementum contain 65% inorganic, 35% organic.

The principle inorganic component is hydroxyapatite crystals which are thin and plate-like and similar to bone.

Classification

Cementum may be classified in the following ways:

By location

Radicular cementum: The cementum that is
-found on the root surface.

-Coronal cementum: The cementum that forms
on the enamel covering the crown.

By cellularity:

-Cellular cementum: cementum containing
cementocytes in lacunae within the cementum
matrix

-Acellular cementum: cementum without any
cells in its matrix.

By the presence of collagen:
fibrils in the matrix:

-Fibrillar cementum: cementum with a matrix that contains well-defined fibrils of type I collagen.

-A fibrillar cementum: cementum that has a matrix devoid of detectable type I collagen fibrils. Instead, the matrix tends to have a fine, granular consistency.

By the origin of the matrix fibers (applies only to fibrillar forms of collagen):

Extrinsic fiber cementum: cementum that contains primarily extrinsic fibers, i.e. Sharpey's fibers that are continuous with principal fibers of the periodontal ligament. Since the fibers were originally produced by periodontal ligament fibroblasts, they are considered "extrinsic" to the cementum. These fibers are orientated more or less perpendicularly to the cementum surface and play a major role in tooth anchorage.

Intrinsic fibers cementum : cementum that contains primarily intrinsic fibers, i.e. fibers produced by cementoblasts and that are orientated more or less parallel to the cementum surface. This form of cementum is located predominantly at sites undergoing repair, following surface resorption. It plays no role in tooth anchorage.

Mixed fiber cementum: cementum that contains a mixture of extrinsic fiber cementum and intrinsic fiber cementum

The descriptors for the classes of cementum described above can be used in various combinations to more precisely describe a specific type of cementum.

Examples follow:

1. A cellular, a fibrillar cementum

This cementum is mostly composed of mineralized matrix, without detectable collagen fibrils or cementocytes. It is produced exclusively by cementoblasts. It is typically found as coronal cementum in human teeth.

2. Acellular, extrinsic fiber cementum

This type of cementum has a matrix of well-defined, type I collagen fibrils. The fibrils are part of the, densely packed Sharpey's fibers, that are continuous with the principal fibers of the periodontal ligament. Because of their dense packing, the individual Sharpey's fibers that form the bulk of the matrix may no longer be identifiable as individual fibers within the cementum layer. This cementum, which is acellular, is located in the cervical two third of the root of human teeth. It plays a major role in tooth anchorage

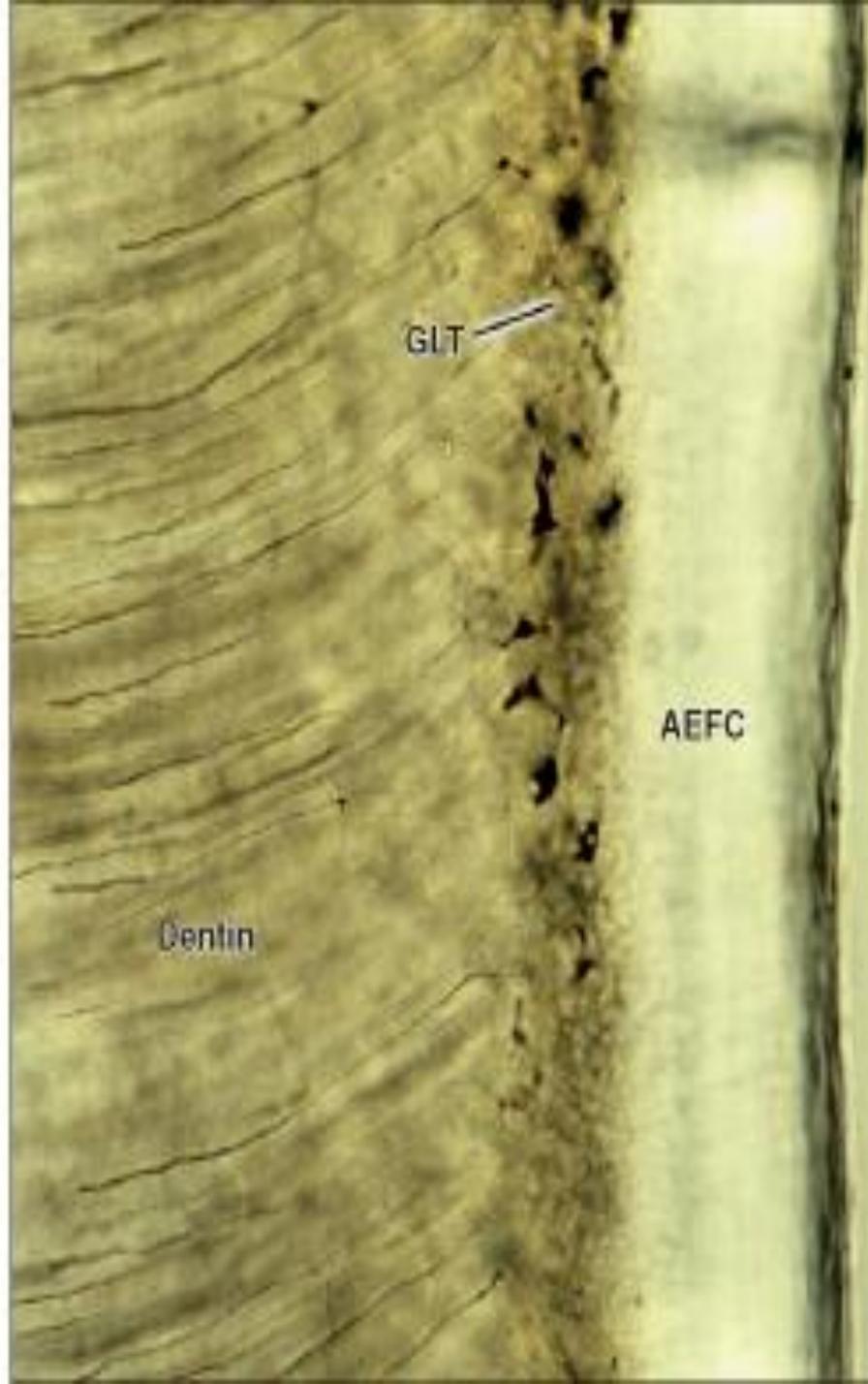
3. Cellular, intrinsic fiber cementum

The cementum contains cementocytes in a matrix composed almost exclusively of intrinsic fiber cementum. It is located almost exclusively at sites of cementum repair . It plays no part in tooth anchorage. However, it may be covered over by extrinsic or mixed fiber cementum, both of which are able to provide new anchorage.

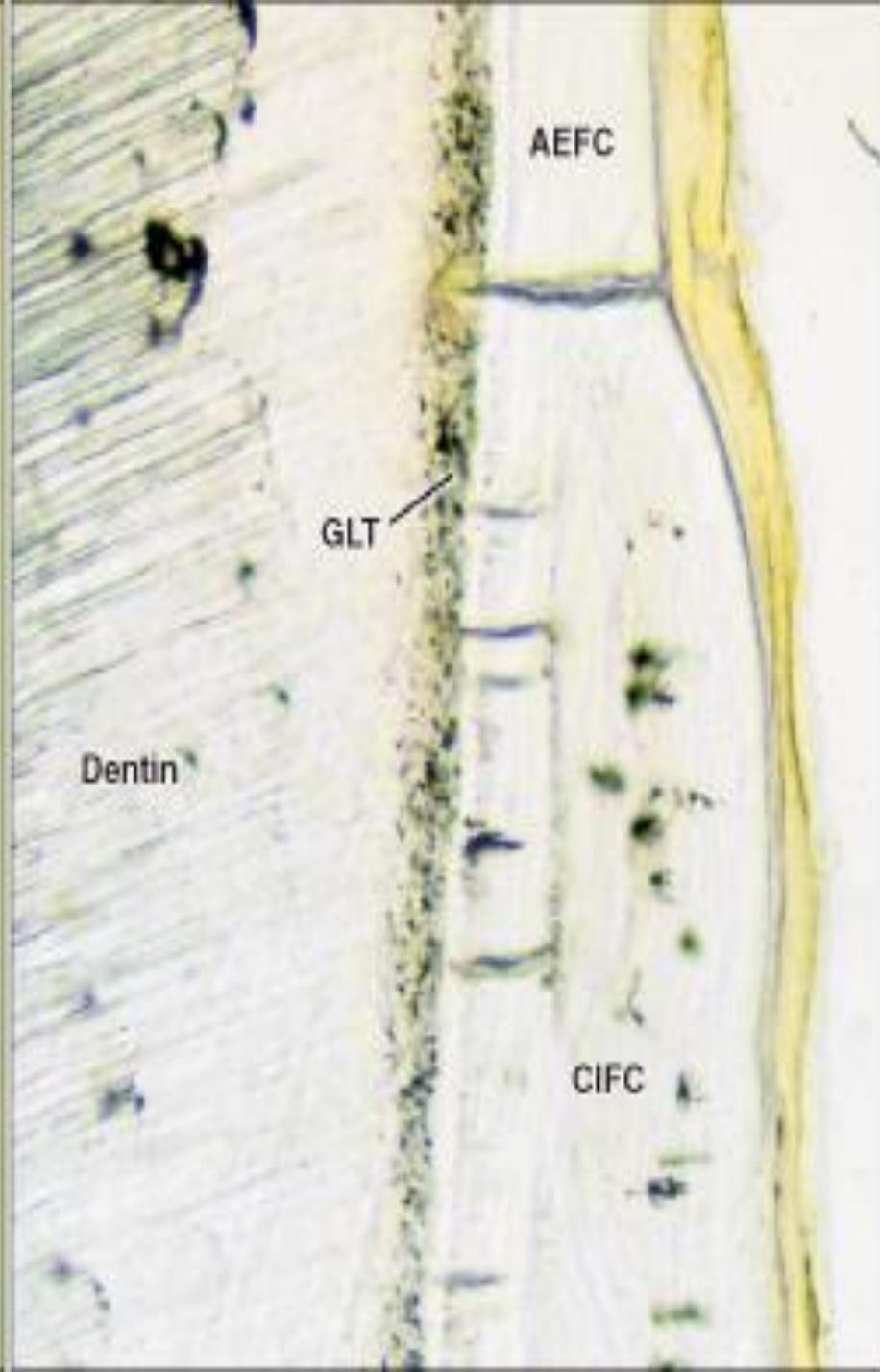
4. Cellular, mixed fiber cementum

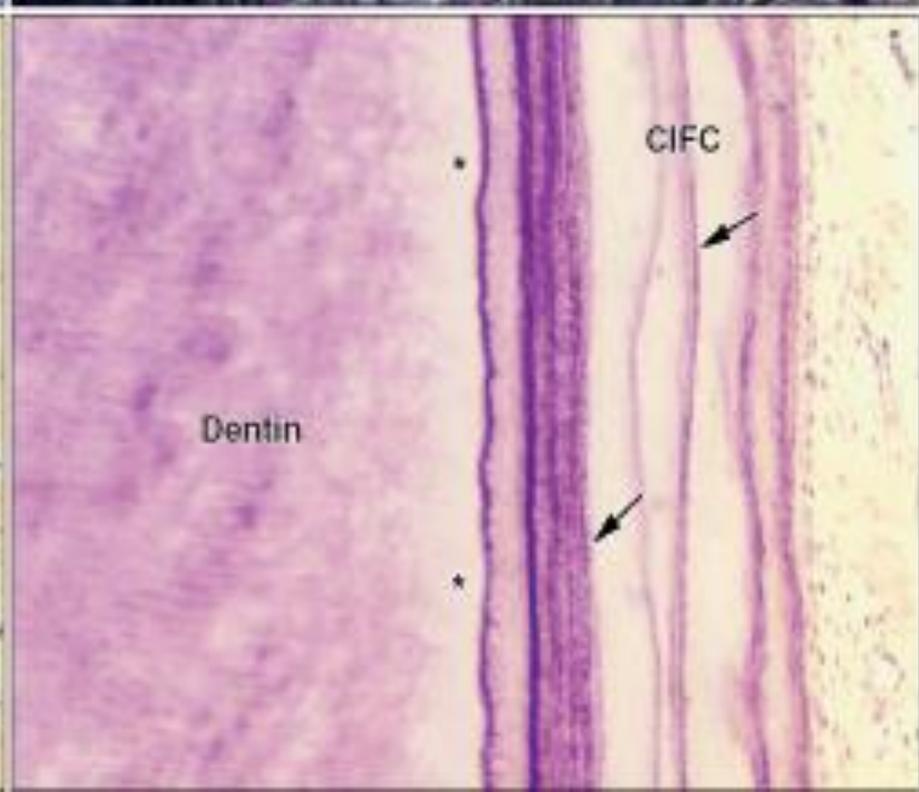
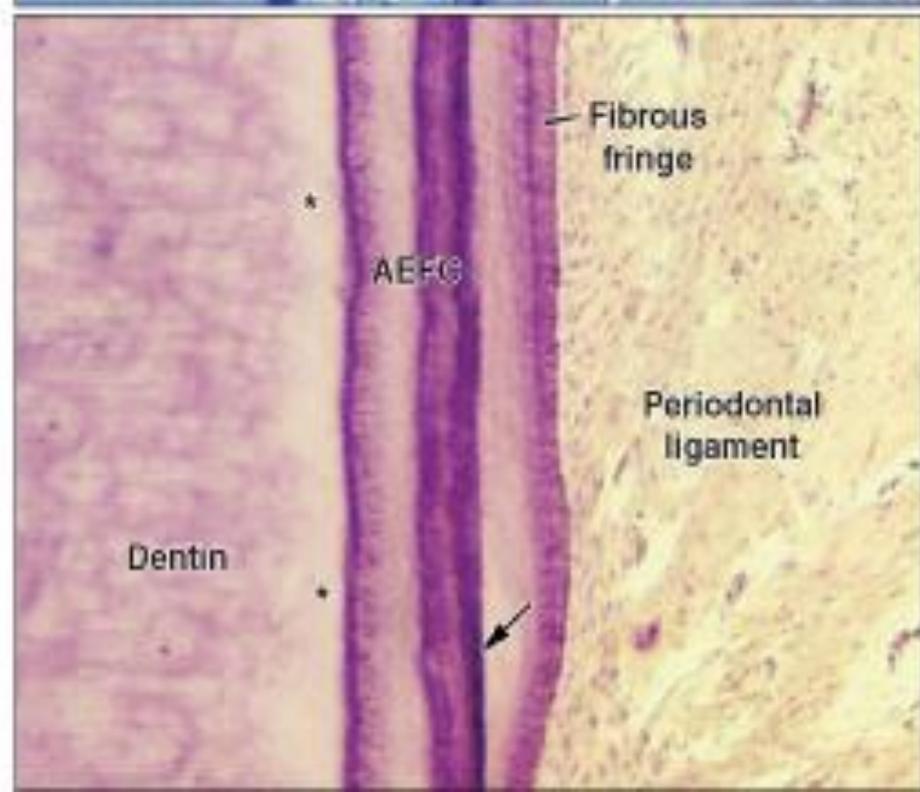
It is found on the apical third of the root and in furcation (i.e. between roots). In these locations, the rate of cementum formation is usually more rapid than in the cervical region. The mineralized, extrinsic collagen fibers (Sharpey's fibers) run a more irregular course than in a cellular, extrinsic fiber cementum. Intrinsic fibers are found interspersed among the extrinsic fibers of the cementum matrix, so that individual Sharpey's fibers are more readily identifiable than in extrinsic fiber cementum. Cementoblasts are trapped in hollow chambers (or lacunae) where they become cementocytes.

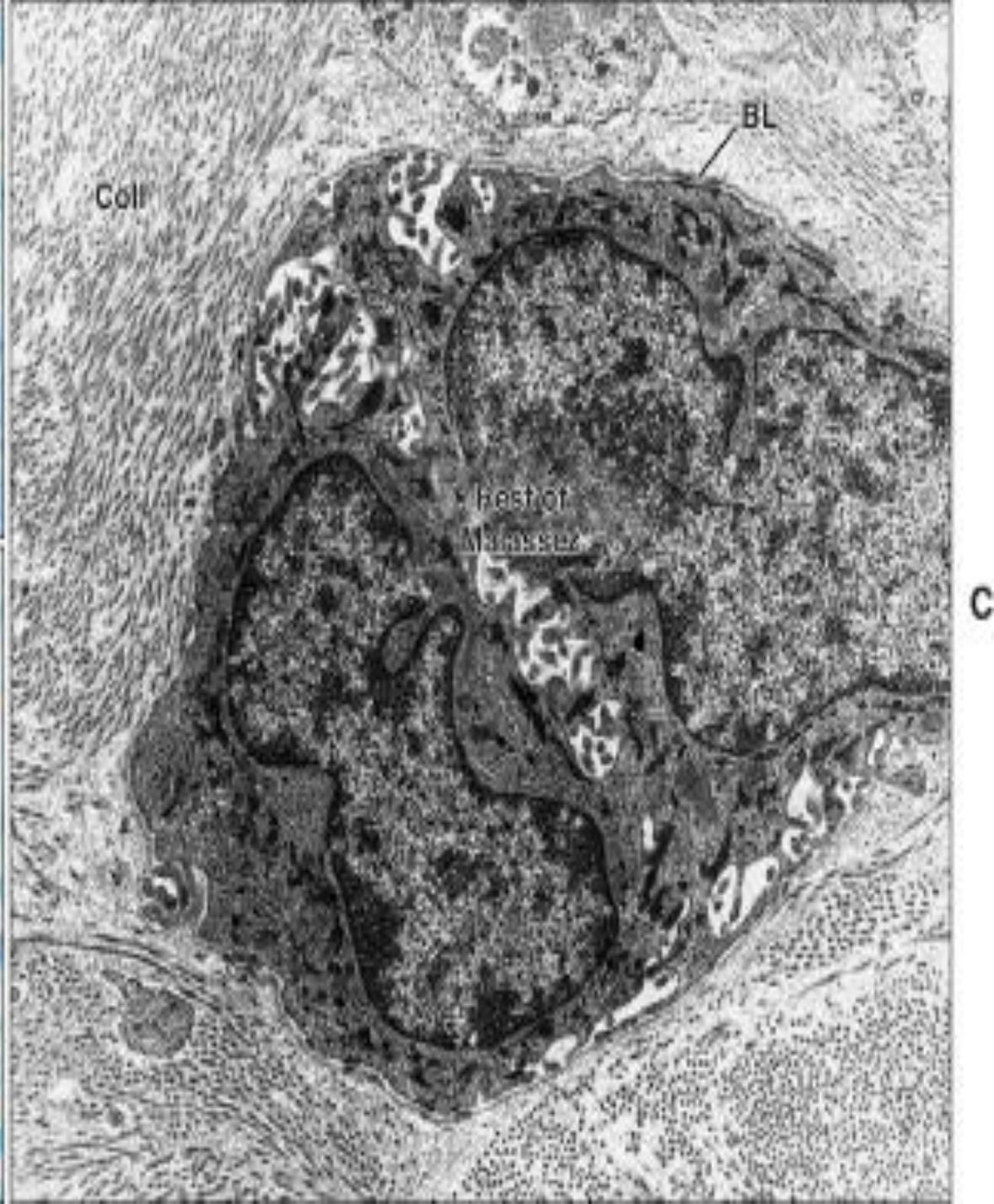
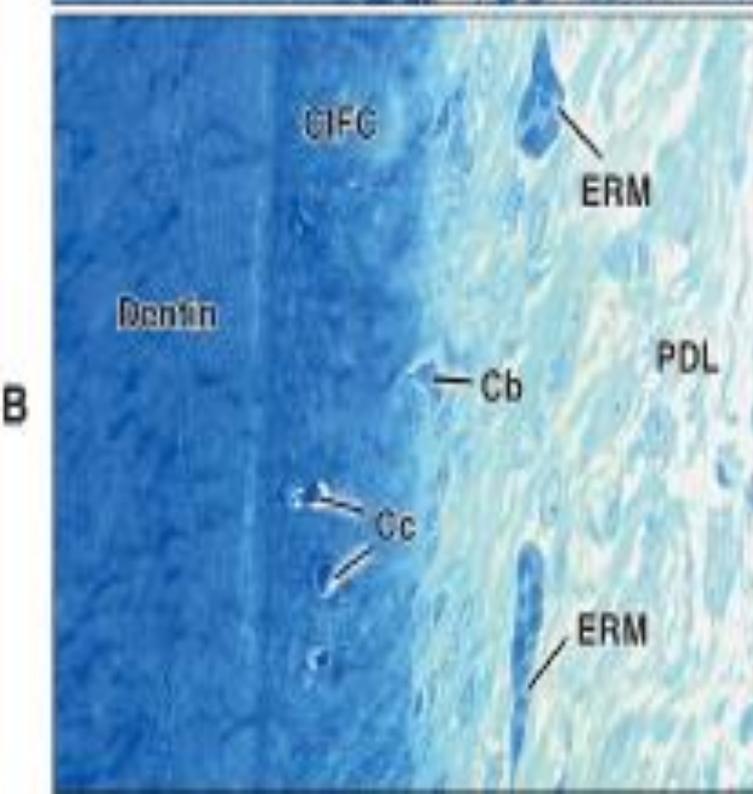
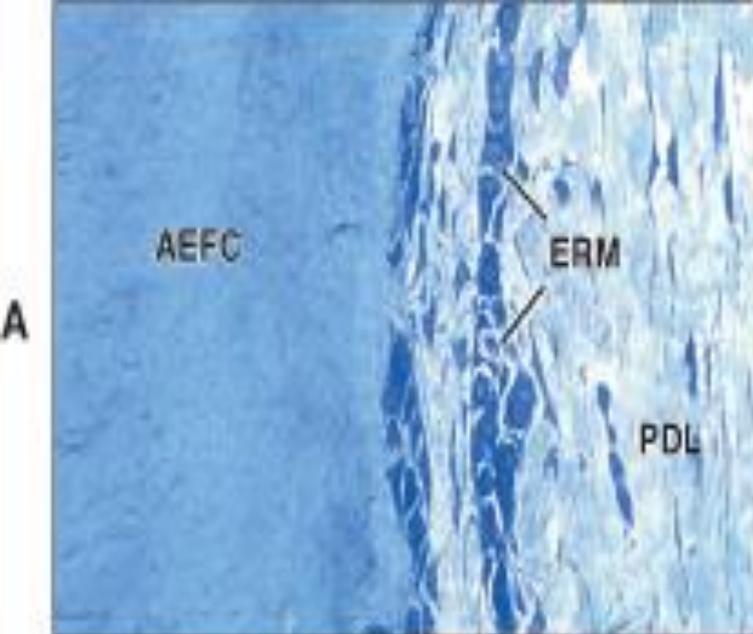
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B







Clinical considerations:

1. Root fracture may repair by formation of cemental callus.
2. Cementicals are small, globular masses of cementum and it may attached to the cementum surface or may located free in periodontal ligament.
3. Hypercementosis, means excessive deposition of cementum may be local to the tooth with a history of chronic periapical inflammation, or may be affected all the teeth as associated with Paget's disease.
Hypercementosis cause a problems during tooth extraction

Reference

- 1- Ten Cate's Oral Histology: Development, Structure, and Function 7th Edition.
- 2- Carranza's Clinical Periodontology (12th ed.)