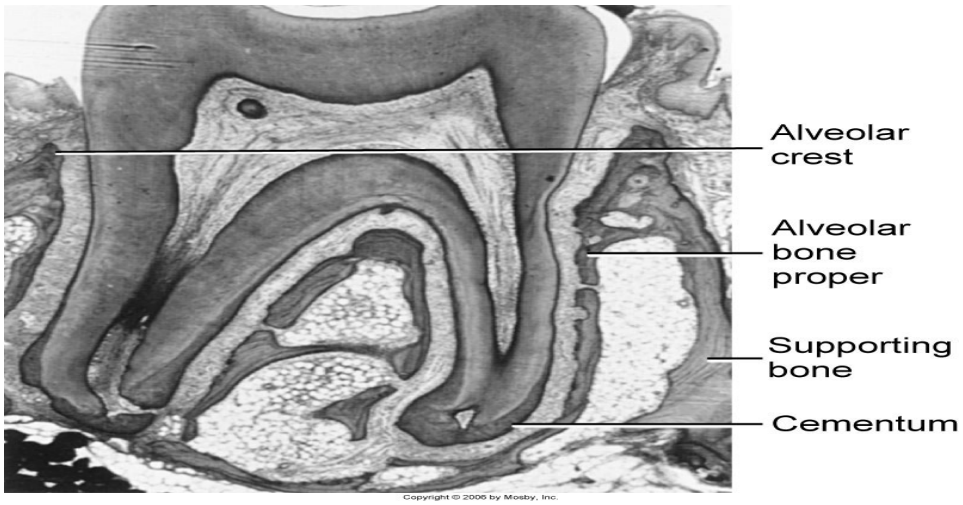
Oral Histo. Lect.13 ا.د.عذراء

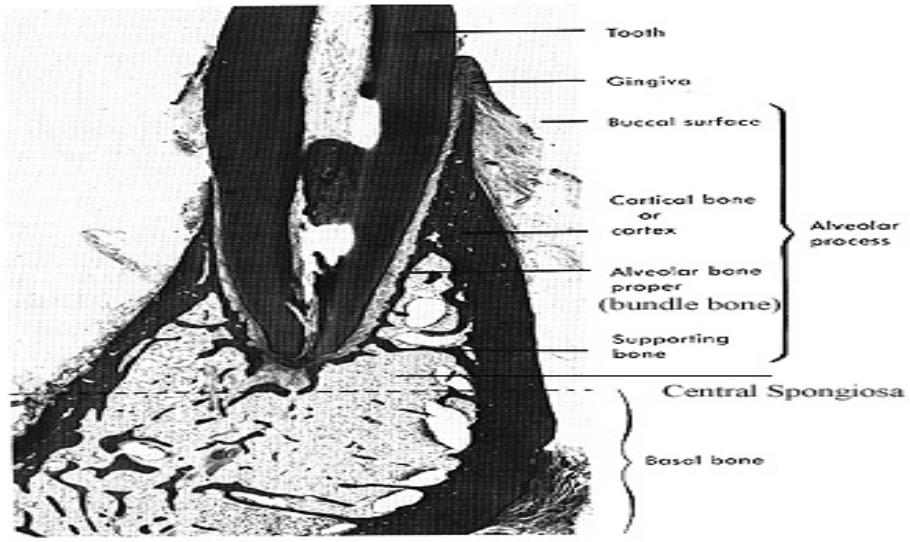
Alveolar Process

The *alveolar process* is that bony portion of the maxilla and mandible where the teeth are embedded and by which tooth roots are supported. **The alveolar crest is found 1.5-2.0 mm below the level of the CEJ.**

Chemical composition

Bone consists **of 65% inorganic** as a hydroxyapatite crystals and **35% organic** as **mainly collagen** and ground substance glycoprotein and proteioglycan and small amount of protein.



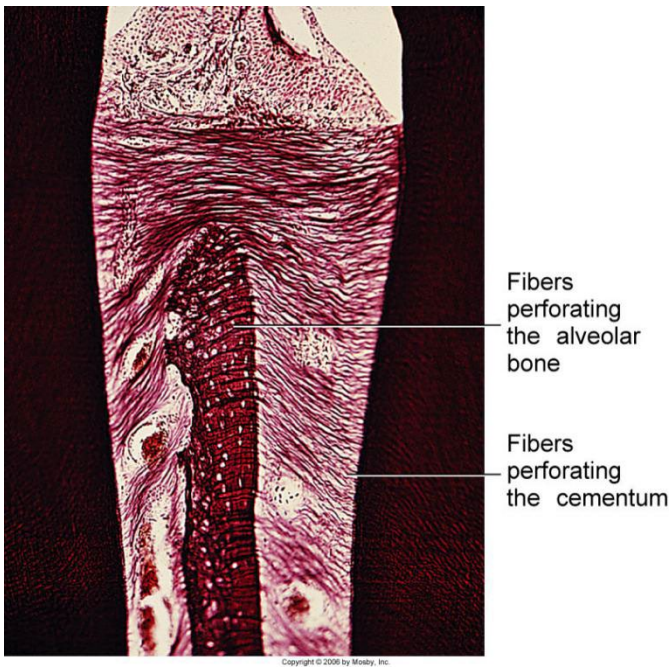


Alveolar bone composed of

1. Alveolar bone proper(bone lining the alveolus (bundle bone)
2. Supporting alveolar bone

a) outer cortical plates
b) a central spongiosa

Alveolar bone proper: lines the tooth.Contains Sharpey's fibers embedded into it Because alveolar process is regularly penetrated by **collagen fiber bundles**,it is also called **bundle bone**. It appears more radiodense(**radio-opaqe**) than surrounding supporting bone in X-rays called **lamina dura .**

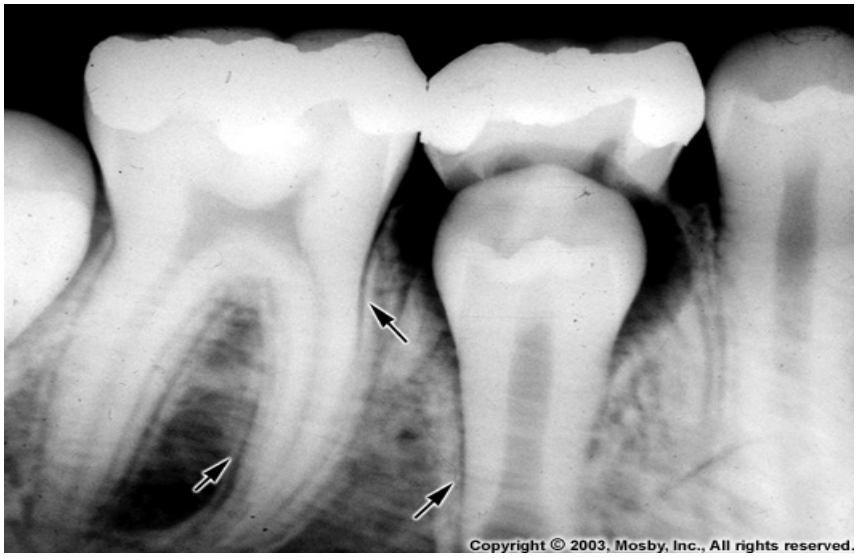


So alveolar bone proper has 3 names

1.Bundle bone (due to penetrated of collagen fibers as sharpy's fiber)

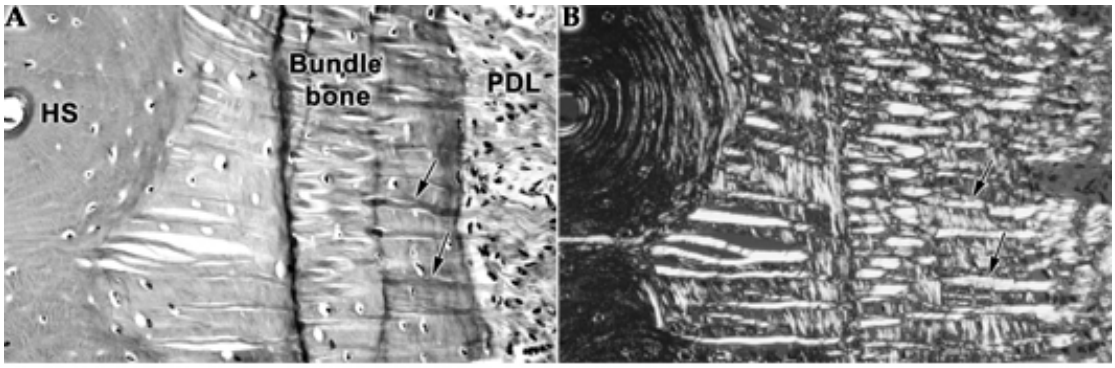
2.Cribriform plate as perforated transmit nerves and vessels

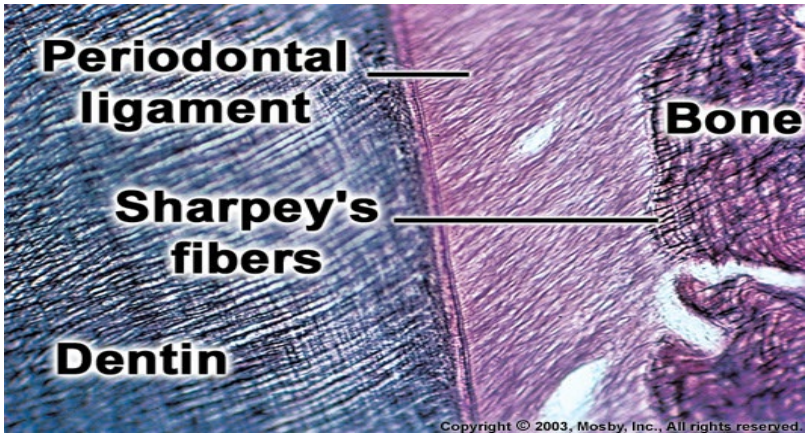
3.Lamina dura (in radiograph only) appear radiopaque because of more mineral around fiber.



Supporting Compact Bone

Similar to compact bone anywhere else (Haversian bone) Extends both on the lingual (palatal) and buccal side **Contains haversian and Volkman's canals** (they both form a continuous channel of nutrient canals).





Bone cells

1. Osteoblasts are mononucleated cells reside on bone surface and responsible for bone formation.

2. Osteocytes are osteoblast cells that trapped in bone matrix that they secreted ,occupied in space known as lacunae.

3. Osteoprogenitor cells are undifferentiated cells found on or near all free surface of bone.

4.Osteoclast cells are a resorptive cell is a large multinucleated cell

- Found in pits in the bone surface which are called resorption bays, or **Howship's lacunae**
- The surface of an osteoclasts which is in contact with bone has a **ruffled border and rich with acid phosphates enzyme.**
- **Resorption occurs in two stages:**

The **mineral is removed** at bone margins and then exposed **organic matrix disintegrates**. The osteoclasts demineralise the inorganic part as well as disintegrates the organic matrix.

- **Woven bone,** (also known as *fibrous bone*) which is characterized by a haphazard organization of collagen fibers occurs initially in **all fetal** bones and In adults after **fractures**
- ***Resorption and regeneration of alveolar bone***

This process can occur during orthodontic movement of teeth. Bone is resorbed on the side of pressure and opposed on the site of tension.