

What We Know About “Life in Jaw Bones”?

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Looking back at few decades ago many people’s minds knew all and nothing about process called bone remodeling. Nowadays, it’s amazing process was reviewed and over whelmong interest has increased and tossed by some thoughts. At first mention in 1952 when P.I. Branemark was implant placement and “bone osteointegration” happen, the definition of bone remodeling is still unclear because of bone is constantly modeling and is controversially being regenerated during life. Additionally, the structure of bone is not the same as the quality of any implants.

Inspite of any reported and scientifically based experience in patient’s rehabilitation, there are still doubtful overcome and predictable success. At first of all, what is bone’s function? One thought come to mind that was said one of founders of theoretical anatomy in paleontology.

“Bone is constructed so that with the smallest expenditure of material have the highest strength, lightness, possibly reducing any stress involved”. L.F.Lesgaft

In addition to mentioned above, might be seeing figures in details, which simplify to understanding controversial issues and explained precisely.



Figure 1: (a bone frozen dating six month ago, a species of pig’s lower jaw).

It has been seen slightly red mucosa, massive attached gingiva, teeth has no excursion.



Despite of extremely cold condition during 6 months to getting a frozen species, blood vessels are visible.



No loss any tooth tissue

Many scientists reported that on molecular point of view, small molecules or various bone cells are responsible for bone life as inside as outside of layers. What these structures care about? Let’s see process inside. At first sight, we are being medicinal educated, knowing about what can lead to as “first signal door” to bone regeneration and then reparation.

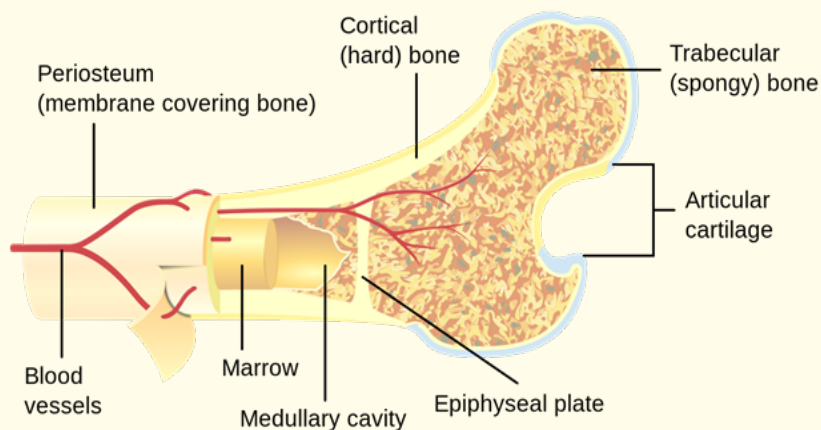


Figure 2: Cross section of bone.

Well described types of bone marrow and its role. In humans, red blood cells are produced by cores of bone marrow in the heads of long bones in a process known as hematopoiesis. Although we have read a lot of literature about types of bone marrow, it’s unclear their role depending of types bone constitution. Here is a short overview of classified of histology of bone:

1. Red bone marrow (Latin: medulla ossium fubra) - is active myeloid tissue.
2. “Yellow marrow” (Latin: medulla ossium flava) - is unactive mediate adipose tissue.
3. Mucous, slimy bone marrow - gelatinous, poor in cells consistency. It is formed in the developing bones of the skull and face. This last example is a result of condition when adipose tissue and myeloid elements losing.





Figure 3: A femoral head with a cortex of bone and medulla of trabecular bone. Both red bone marrow and a central focus of yellow bone marrow are visible.

Of course, it's probably true but bone is still remodeling and has some transformation during life and this process depends on many factors. The body can convert yellow marrow back to red marrow to increase blood cell production, the signal starting from periosteum where cells increase to repair damaged bone, if it takes place to happen. Next step is metabolism known as a lifelong process where mature tissue is removed (a process called resorption) and new tissue is formed (a process called ossification or new formation). The repetitive processes lead to bone remodeling.

From the getting bone trauma and hemorrhage takes few minutes, a key role as for longevity and bone healing depends on osteoclast's work. Life of these cells is approximately 14 days, then osteoblasts has been working 2-3 months depending on jaw either maxilla or mandibular and process of healing as well. In my opinion, there are cells remembering from embryogenesis and still active until bone death.

Do all bones have the same time to be non-functional or passive lazy bones?

Most of the bones of the skull are flat bones, as is the sternum.

Long bones are modified, the diaphysis that is much longer than its width, and by epiphysis, a rounded head to each end of the shaft.

Irregular bones do not fit into the above categories. The bones of the spine, pelvis, and some bones of the skull are irregular bones. Examples include the ethmoid and sphenoid bones.

Depending on layered structure each example might be seen as woven (fibrous bone) or lamellar origin.

In terms of types of bone, I would clarify this classification in relation to tooth position and jaw, starting from frontal group of teeth as a first type of bone and finishing distal group of teeth as a fourth type of bone. Well-known about 4 types of bone on origin whether compact or lamellar layer are seen by radiography or digital computer tomography. Additionally, must be examined anatomy of operating area.

However, we faced with material in situ seeing from “clear first sight’ as the best one and not good during surgery, there is still unconscious classification of types of bone.

Dried vs frozen species









Perio tissues surrounding teeth are visible. All teeth are stable. The species was dried 48 hours.

From the point of view that all cells contain a water layer, i have questioned of what is mucosa marrow bone? Is it identical to periosteum or perio ligament?

In situ, we even approximately have knowledge about period of healing because of controversial point of view in literature. On this reason, how can be assure predictable outcome in planning of treatment? While experienced with animal head corps there has been seen differences between “dead and live” animal bones that are vary from those that patient’s jaws in viva, for example while implant placement.

Well described in literature about histology of tissues and cells are responsible for osteoproduective process. The time of healing is approximately the same as a period of osteointegration. To make experience looking at animal jaw, we pointed out that even has placed animal bones for a long time in unconvinient conditions either heated or frozen-dried, some cells remains alive able since 7-8 hours after terminated death. On opposite side, people’s bone osteointegration occurs 2 - 3 months depending on jaw. From this theory, I would conclude that modern osteomaterials are necessary to place and these will be work as matrix. However, bone works always as a barrier and there should be resorptions as an optimized factor in process of regeneration.

Dilemma takes role while active osteogenesis transforms into passive process that has more stable results on outcome of treatment. Does it mean that passive osteogenesis is “dead process” and would it be lead to failed results inspite of best protocol’s conditions in situ? This problem discussed in many journals, but we do not know about how many tissue layers was destroyed and is there at least one layer remains active and retrieve?

To summarize up, I would suppose that the tooth is a small bone surrounding of the perio capsule. Also, I guess we try to restore a periosteum and perio ligament around the tooth that may be seen any further. In terms of bone remodeling is sophisticated process that includes regeneration and reparation. Bone loss is a “natural life long process” depending on multifactors such as operating technique was applied and materials were chosen.



Figure 4: Pig jaw with dead periodontal ligament after 72 hours.

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