

Intramembranous ossification

Intramembranous ossification is characterized by the formation of bone directly from **connective tissue** - endemically.

Process

The first step of this process is the development of a **condensed layer of mesenchyme**. In this structure, the cells become rounded, differentiate their organelle system and become osteoprogenitor cells. Simultaneously, the **vascularization** of this tissue is carried out. Along the capillaries, osteoprogenitor cells give rise to **osteoblast**, which will thereupon differentiate and proliferate. Osteoblasts synthesize bone mass (matrix), deposit inorganic materials in it and create islets of **woven bone** developing the first bone beams, which will then act as ossification centers.

The structure grows **apically**, and osteoblasts are aligned on the surface of the bone lacunae so that they can form **another matrix**. Converging trabeculae and islets of bone together with blood vessels form the spongy structure of the primary bone. The ossification center enlarges and expands towards the periphery (circumference) of the bone until it **replaces** the original connective tissue.

The most superficial layers of the connecting tissue, which do not undergo ossification, turn into the **periosteum**. **New bone formation** takes place in the periosteum all throughout life, but most intensively during the growth period. This appositional growth is complemented by resorption of bone to preserve the shapes and proportions of the body.

The original woven bone is then transformed into **lamellar** bone.

Examples

This type of ossification is characteristic of cranial flat bones, the facial part of the skull and clavicle.

Links

Microscope:

Virtual microscope link (<https://mikroskop.wikiskripta.eu/?idx=20034+>)

Related articles

- Bone
- Endochondral ossification
- Bone growth and healing

References

- ČIHÁK, Radomír – GRIM, Miloš. *Anatomie*. 2.. edition. Grada Publishing, 2002. 470 pp. vol. 1. ISBN 80-7169-970-5.
- GRIM, Miloš – DRUGA, Rastislav. *Základy anatomie 1*. 1. edition. Praha : Galén, 2006. 105 pp. ISBN 80-7262-112-2.