Ilizarov's method can be used in the treatment of fractures primarily secondarily (like in the treatment of malunion or nonunions). The correction of bony deformities is simply founded on the basis of creating a new fracture in the bone lengthening procedures and making corrections at the healing phase of this fracture by circular external fixator. We will discuss in this chapter how the process of bone healing is understood by the physicians according to the techniques used, or how the healing process is changed or not changed with the use of new technologies thus creating confusions and misunderstandings.

The two main clusters of bone cells, namely osteoblasts and osteoclasts are different both in terms of action and productive materials. Those cell units initiate the action with different impulses and also the results are different. Osteoblasts multiply with mitosis and produce bony matrix at the synthesis phase. This matrix organizes itself according to the load applied. Bone does not act like a tissue in the healing process, but it does try to heal like an organ (with inflammatory response), thus simple fractures (like stress fractures) that do not extend to the Haversian system heal with bone's own defense (osteoclast) and reconstructive (osteoblast) cells without any inflammatory process.

Internal fixation devices are used at the fractures extending to the Haversian System and the body reacts with inflammation to those devices. This reaction overlaps with the bony healing process thus creating different healing modalities. Intrauterin bone tissue derives from mesenchimal stem cells both in the growth and development phases and the healing phase. Stem cells have different destiny according to the impulses implied. Every kind of differentiation is present in every step of the bone healing process but their amount is different. It used to be believed that stem cells are found in certain parts of the body but after 2005 stem cells have been found circulating in the blood stream.