

## Abstract

The work provides a comprehensive overview of the issues hallux rigidus with a focus on the first metatarsophalangeal joint replacement and development of our own implant. The development was built to perform anatomical studies, the results were the basis for the construction of hemiarthroplasty and total arthroplasty. It was necessary to measure the marrow cavities of the distal part of first metatarsal and proximal half of proximal phalanx. We measured the size of the metatarsal head in two planes, and its tendency to diaphysis on the dry preparations. Through these studies we obtained valid data for the construction all components of both hemiarthroplasty and total arthroplasty of specifying the size spectrum. We have verified and then corrected the shape of implant treatment during post-mortem tests on the models. The result is a new type of arthroplasty with their own design to guarantee restoration of joint function and coated with a high osteointegral potential.

In clinical studies, we performed 22 implantations of hemiarthroplasty and one implantation of total arthroplasty. Clinical results suggest the fact that the implant will be successful. However the ultimate answer to this question will provide long-term study.

The other results presented with a detailed anatomical description show to what extent should be done resection of the proximal phalanx base in the performance of the first MTP joint, in order to preserve a sufficient portion of the insertion of the flexor hallucis brevis.