
Department of Orthopedic Surgery

Department of Orthopedic Surgery of Charles University, Faculty of Medicine in Hradec Kralove and University Hospital provides preventive and curative care in practically the entire spectrum of orthopaedics and traumatology of the musculoskeletal system except for spondylosurgery. The services include reconstructive rescue surgery, including arthroscopic surgery, as well as implantation of joint replacements for musculoskeletal disorders caused by congenital defects, post-traumatic conditions, inflammatory or tumorous destruction, procedures in the field of paediatric and septic orthopaedics, hand and foot surgery. The Department of Surgery provides undergraduate teaching of medical students. The scientific and research activity at the department is mainly focused on the issue of healing of bone defects using synthetic biomaterials and on the issue of musculoskeletal infections.

Department of Orthopedic Surgery has one of the few clinical departments with its own paediatric and septic department. Therefore, complex reconstructive procedures of serious congenital defects and severe acquired deformities in the hip, knee and leg joints are performed practically in the whole age spectrum from newborn age to adulthood.

Main research topics

- Healing of segmental bone defects of the diaphysis of long bones using synthetic biomaterials based on tricalcium phosphate, hyaluronate and bone morphogenetic protein.
- Synthetic biomaterials serving as local antibiotic carriers
- Musculoskeletal surgery in patients with severe deformities and skeletal destruction, including geriatric patients.

Scientific research groups

- As part of a preclinical project with institutional research support at the Faculty of Medicine, the group focused on the research of synthetic biomaterials serving as carriers for local application of antibiotics.
- As part of a pre-clinical project with institutional research support at FN HK, a group focused on the research of synthetic biomaterials for the treatment of segmental skeletal defects.

Another form of involvement of the department's team in scientific research activities are ad hoc groups focused on solving selected problems (e.g. currently evaluating the results of surgical orthopaedic interventions in patients with periprosthetic fractures and musculoskeletal infections).

Equipment

The Department of Orthopedic Surgery does not have any research-only equipment. When solving research tasks, it uses technical equipment of cooperating workplaces within the CU MED HK, FN HK, FFUK in Hradec Kralove and FVZ UO.

Cooperation

- In collaboration with the Faculty of Pharmacy of the Charles University in Hradec Kralove, research in the field of prevention of resistant biofilm formation in patients with implanted synthetic material using PLGA nanoparticles serving as a carrier for rifampicin.
- Pre-clinical testing of impregnation of bone grafts using PLGA microparticles as a carrier for antibiotics in collaboration with the Faculty of Pharmacy of the Charles University in Hradec Králové.

Achievements

Solution of the TAČR project Innovation of cryopreservation method for clinical use of autologous multipotent mesenchymal stem cells for treatment of extensive skeletal defects. TA CR GAMA registration number: TG02010020-4. 2016-2018.