INTRODUCTION: The purpose of the current retrospective study was to analyze the incidence of infection after surgery and reconstruction with modular megaprostheses and to evaluate its treatment and outcome at long term.

METHODS: Between 1983 and 2012, 1,275 modular uncemented megaprostheses; 58% were implanted in males and 42% females with mean age 31.4 yrs: 160 KMFTR, 653 HMRS prostheses, 68 HMRS Rotating Hinge and 394 GMRS. Sites: distal femur 805, proximal tibia 261, proximal femur 168, total femur 31, distal femur and proximal tibia 10. In all patients, a five-day regimen of intravenous antibiotic prophylaxis including amikacin and teicoplanin starting one hour preoperatively was administered. Infections were investigated with regard to time of occurrence (“postoperative” in the first four weeks from surgery, “early” within six months and “late” after six months), microbic agents, treatment strategies, number and type of revision operations, determination of risk factors and final outcome. Usual surgical treatment was “two stage” (removal of implant, one or more cement spacers with antibiotics, new implant), with antibiotics according with cultures. One stage treatment was used for immediate postoperative infections, only since 1998. Functional results after treatment of infection were assessed using the MSTS system.

RESULTS: The overall incidence of postoperative infections was 9.2% (117/1275). Infection occurred at mean time of 3.7 yrs (min 1 month, max 19 yrs) in 18 KMFTR, 54 HMRS, 6 HMRS Rotating Hinge, 37 GMRS. Sites: 70 distal femurs, 35 proximal tibias, 10 proximal femurs, one total femur and one extrarticular knee resection. Infections were generally monomicrobial and caused by gram positives. Most frequent bacteria causing infection were: Staphilococcus Epidermidis (51), Staphilococcus Aureus (19), Pseudomonas Aeruginosa (6), Stafilococcus Lugdunensis (1) and Serratia Marcescens (1). Infection occurred postoperatively within four weeks in 15 cases, early (within six months) in 25 cases, late (after six months) in 77 cases. A two stage revision was attempted in 90 pts (77%): in 74 cases a new prostheses was implanted (with negative laboratory tests for infection) at mean time of five months (min 2, max 16 months), but in four pts infection recurred and they were amputated; 12 pts were amputated after several spacers since infection did not heal. One stage revision was performed in 22 cases, with successful results. In five cases an amputation was primarily performed. Revisions for infection were successful in 96 pts (82%), while 21 pts were amputated (18%). The overall survival to infection in all series was 88% at 10 years and 84% at 20 years with a significant difference between the sites of reconstruction (p= 0.01). Functional results evaluated in 53 revised cases were good or excellent in 43 (81.1%).
DISCUSSION AND CONCLUSIONS: Infection in modular megaprosthesis is a severe complication in orthopedic oncology after tumor resection. In the present series, infection was mostly late, monomicrobial and caused by gram positive. Outcome is influenced by chemotherapy, by the presence of foreign bodies and by poor soft tissue condition. Two-stage treatment of infected megaprotheses is successful in most cases. One stage has selected indications, mainly in postoperative immediate infections.