

Decreasing Patellar Height Following Distal Femur Resection and Its Relation to Functional Parameters.

Background: Distal femoral tumor resection and megaprosthesis reconstruction is a common procedure. It is well known that controlling patellar height during those reconstructions is challenging. Patellar height can also change during the outcome of those procedures, and the knee function can be influenced by the patellar height variation. The amount of patellar height variation after distal femur megaprosthesis reconstruction and the consequences on the knee function need particular attention.

Objective: Verify how much the patellar height changes after distal femur reconstruction using endoprostheses and what is the impact to functional knee parameters.

Materials and Methods: A retrospective analysis of patients underwent distal femur resections and reconstruction with rotating hinge megaprosthesis was performed. Patients were followed for at least one year after the resection. Patients with growing prostheses, extra-articular knee resections, patellectomies, revisions, distal femur associated with proximal tibia replacements, associated amputations, allografts and allograft composites were excluded. The patellar height was calculated using Insall-Salvati ratio (ISR) and Insall-Salvati patellar tendon insertion ratio (PTR). The ratios were calculated based on the postoperative radiographs taken one to three months after the procedure and at the final follow-up. Data regarding anterior knee pain (AKP), range of motion (ROM), extensor lag (EXL) were retrieved from clinical notes.

Results: The cohort comprised 108 patients. Mean age 33.9 years (sd: 19,0; range 12 to 75). Same sex distribution. Sixty patients had non-resurfaced and 48 had resurfaced patellas. Average follow-up was 4.5 years (sd: 4.0; range 0.7 to 20). The mean postoperative ISR was 1.02

(sd: 0.2) and the final follow-up was 0.95 (sd:0.2) ($p<0.0001$). Patella baja was present in 16 (15%) patients at postoperative follow-up and increased to 24 (22%) at final follow-up ($p=0.0574$). The mean postoperative PTR was 1.45 (sd:0.4) and the final was 1.40 (sd: 0.3) ($p=0.016$) below inferior standard level (1.61). Linear regression model and logistic regression model did not show association between patellar height and AKP, ROM, EXL. The 24 patients presenting with patella baja ($ISR<0.8$) did not present decreased ROM or increased AKP.

Conclusions: There is significant decrease of patellar height following distal femur reconstruction using megaprosthesis. However there is no association between patella height and AKP, ROM or EXL.
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