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Distal Femur and Proximal Tibia Resections

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The knee and its proximity is the most common anatomic location requiring surgery for bone sarcomas. Distal femoral and proximal tibia resections are therefore among the most commonly performed limb sparing procedures in Musculoskeletal Oncology. During the last three decades, the indication to limb salvage surgery has greatly expanded because of a favorable combination of factors including new imaging modalities such as CT and MRI scan, introduction of preoperative chemotherapy for high-grade bone sarcomas, and availability of adequate reconstructive options. Careful consideration of tumor location and extension, patient's age, functional demands and expectations, along with family and social support, are key factors to be considered in order to provide optimal treatment customized to each individual patient. The evolution of implant and hinge design, materials, and fixation has substantially improved long term durability and functional outcome of massive prosthetic replacements, while reducing at the same time the incidence of early and late complications. For adult and teen-ager patients, massive prosthesis is the preferred reconstructive technique by most surgeons following distal femoral resection; nevertheless, unicondylar ostearticular allograft may be considered in selected circumstances after hemiarticular resection. Massive prosthetic replacement and allograft-prosthetic composite are both viable options commonly used for proximal tibia reconstruction. Newer prosthetic designs and novel bone fixation concepts in form of hybrid stemmed-collared and compliant compressive devices are currently associated with excellent mid-term results, as it is also the case for cemented fixation using the French-paradox technique. In pediatric patients, while rotationplasty remains a successful technique predictably associated with durable results, the new generation of non-invasive expandable implants appears significantly improved in both fixation and reliability of closed expansion mechanism.

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