

Number & Title: 11219 - Extraarticular Total Knee Resection For The Malignant Tumor Invading Into The Joint

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Abstract

Background Extraarticular total knee resection should be performed for the malignant tumors invading into the joint cavity in order to remove the tumor completely. However with respect to routine transarticular resection, extraarticular resection is technically demanding with complex reconstruction. So the knee structure should be studied and the reconstructive effects should be observed.

Purposes To carry out anatomical observation related to extraarticular total knee resection and apply clinically and to observe how to achieve extraarticular detachment and preserve and reconstruct the extensor mechanism.

Patients and Methods There were 6 fresh total knee joint specimens with the intact capsule. The specimens were thawed at room temperature for anatomical observation. Contrast agent with different concentration was injected into the joints capsule and the deep infrapatellar bursas. Methylene blue was injected into the joints capsule. After performing CT examination, the specimens were detached and the patella and patellar tendons were removed according to the requirement of extraarticular resection. The relationship of articular capsule, infrapatellar fat pad and deep infrapatellar bursa and the feasibility of extraarticular total-knee resection were observed. Four patients were performed extraarticular total knee resection who were 1 male and 3 females. The tumors were located at distal femur in 2 cases, proximal tibia in 1 and into the joint in 1. There were 2 osteosarcomas, 1 malignant fibrous histiocytoma and 1 synoviosarcoma. The tumors invaded into the joints in all four cases defined through MRI examination. Deep infrapatellar bursa radiography was performed in 2 cases. After neoadjuvant chemotherapy, extraarticular resection was performed. The quadriceps tendons and patellas were splited or osteotomied in coronal plane. The patellar ligaments were reserved intactly in 2 cases and splited in coronal plane in 2. The results of tumor controlling and function were observed.

Results In the observations of the 6 specimens, suprapatellar bursa, subtendinous bursa of medial and lateral head of the gastrocnemius and the biceps femoris, popliteus muscle bursa were found to be communicated with the joint cavity. While the deep infrapatellar bursa was not communicated with the cavity. Furthermore, infrapatellar fat pad located between the patellar tendon and joint cavity to form a good barrier to tumor invasion. So patellar tendon could be reserved completely if the infrapatellar fat pad was not involved. With a mean follow-up of 19 months (range, 10-28 months), there were not local recurrence and metastasis in all 4 patients. The degree of the involved knee flexion was mean 105 ° (range: 95-118 °) and the extension lag was mean 22 ° (range, 10-40 °). The function score according to the MSTs scoring system was 72.5%.

Conclusion The deep infrapatellar bursa radiography should be performed routinely in order to clear if the bursa is communicated with the joint cavity or not. The patellar ligament could be reserved completely in the extra-articular total knee resection due to the independence of the deep infrapatellar bursa and the joint cavity and the presence of the infrapatellar fat pad. In few cases only the superficial half of the patellar ligament was remained which could meet the need of extension. Good results of tumor controlling and function were reached in preliminary clinical application.