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Is superior tibiofibular joint resection necessary in extraarticular knee resection for sarcomas?

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Background: Sarcomas infiltrating the knee joint require extraarticular resection to achieve wide margins. The superior tibiofibular joint (STFJ) is in close proximity to the knee joint. According to anatomy textbooks it is not considered to be a part of the knee joint, since there is no connecting capsule or communication between the compartments. However, several anatomical studies have reported communication between the tibiofemoral joint (TFJ) and STFJ after histopathological dissection of the knee joint. The exact extent of sarcoma resection is of particular relevance for orthopedic tumor surgery and sarcoma management since inadequate resection margins result in high local recurrence rates.

Questions: To clarify this issue we investigated (1) the frequency of communication between the TFJ and the STFJ, and (2) the reported local recurrence rates (LRR) following extraarticular knee resections for sarcomas.

Methods: Two Pubmed and EMBASE based literature reviews were performed using the search algorithms "communication AND tibiofibular AND (knee OR tibiofemoral)" (Five out of 27 studies included) and "resection AND knee AND extraarticular OR extra-articular" (5 out of 68 studies included). For inclusion (1), communication rates between the superior tibiofibular joint and the knee joint had to be reported based either on (A) in vivo investigation or (B) histopathological dissection. Regarding local recurrence rates (2) the following inclusion criteria had to be fulfilled: local recurrence rate data available either from the text or calculable from data included in the text unequivocally analyzed for extraarticular knee resection and description of the surgical technique used for extraarticular knee resection.

Results: Cadaver studies (n=4) detected communication between the TFJ and STFJ in 10%- 64% of the cases. There was one in-vivo study in which, following contrast medium injection plus weight bearing, delayed MRI or CT showed a 100% communication rate. In our systematic review of LRR, the mean number of patients per study was 20.2 (range, 9-55 patients), with a mean follow-up of 46 months (range, 1-204 months). Regarding the extent of extraarticular knee resection, two institutions where the STFJ was resected had a LRR of 4-8%, while studies from another three where the STFJ was not routinely resected reported a LRR of 0-21%.

Conclusions: In conclusion, we found a communication rate between the TFJ and the STFJ of up to 100%. We feel that despite our small number of studies and low evidence, extraarticular resection without resection of the STFJ should be considered- at least- as contaminated. The influence of the choice of surgical approach on the LRR unfortunately remains unclear. Due to major differences in study design, current literature does not allow a conclusive interpretation.