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## Autobiologic reconstructions with vascularized fibula grafts revisited.

### Functional evaluation and a long-term follow-up (>10 years)

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#### Background

Limb-sparing surgery with preserved joint-function in children with immature skeleton can be performed using vascularized fibula grafts (VFGs).

#### Material

1. A nine-year-old girl with a IIA osteosarcoma of the distal femur had chemotherapy (ISG-SSG I). In 2000-09 her distal femur was resected and dual VFGs were used for reconstruction. The cruciate-ligaments were reconstructed using the LCL and BF tendon. Functional score (FS) at 3-y-postop; 20/30. Follow-up (12 years): Epiphyseodesis was performed when leg-length-discrepancy was 4.5 cm. An anterior dislocation of the VFGs led to resection of the distal femur and a Mutars prosthesis (2007-09). FS with the original reconstruction was 20/30. Leg length discrepancy has been reduced (callusdistraction). 12-y-postop the FS is 26/30.

2. A nine-year-old girl with a IIB Ewing sarcoma of the proximal femur had chemotherapy (Euro-Ewing). In 1999-07 20 cm of her proximal femur was resected and dual VFGs were used. The hip joint-capsule was sutured like a pouch around the fibula head. Restriction of motion was maintained for 18 months postoperatively with an external orthosis. FS 4-y-postop was 23/30. Follow-up (13.5 years): The fibula head has remodeled into a cœfemoral head. FS was 26/30 after leg-lengthening (callusdistraction).

3. A six-year-old girl with a IIB telangiectatic osteosarcoma of the proximal humerus had chemotherapy (ISG-SSG I). 1999-11 10 cm of her proximal humerus was resected and a VGF was used for the reconstruction. The long biceps brachi tendon was sutured to the LCL and distal end of the BF tendon. The remaining rotatorcuff was sutured like a pouch around the fibula head. She had thoracobrachial plaster for 12 weeks postoperatively. FS 2-y-postop was 26/30 and 29/30 at 5 years. 6-y-postop she presented with a soft tissue recurrence in the triceps brachi muscle. After pre-operative chemotherapy a local excision was performed (2006-05). Follow-up (13 years): there are no signs of local or distant recurrence and her FS is 26/30.

#### Conclusion

Autobiologic reconstructions with preserved joint function is a viable option to extendable prostheses in children with bone sarcomas of the immature skeleton. Among the large joints the functional rank order of success seem to be shoulder>hip>knee.

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