Salvage of a foot by free transplants from the contralateral leg in a 5-year-old

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A 5-year-old girl had a traumatic amputation of her left thigh and on the right side loss of the posterior part of the talus and parts of the posterior tibial nerve and artery. These defects were treated with free transplantation of the corresponding part of the talus from the amputated left leg and a vascularized graft from the left posterior tibial nerve and artery.

2 years later the girl was able to walk without crutches, the ankle mobility was good, and so was the sensibility in the sole of the foot.

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We present a case where traumatic lesions in the ankle were reconstructed with tissues obtained from the traumatically amputated contralateral leg.

Case report

A 5-year-old girl was seriously damaged by an agricultural machine. Her right arm was traumatically amputated at the middle part of the humerus, and the elbow joint was missing. Her left thigh was amputated above the knee: all parts except the ankle joint were completely destroyed so that the leg could not be saved.

On her right leg a deep defect about 5 cm wide from behind was apparent. Almost half of the body of the talus was missing, but the joint surface of the distal part of the tibia was intact. About 3 cm of the posterior tibial nerve and artery were missing.

The talus of the amputated left leg was formed to fill the defect on the right side. The articular surface towards the tibia became congruent with fine cartilage. The joint with the calcaneus was fused. The transplant was fixed with osteo-sutures and percutaneous pins through the calcaneus upwards into the tibia.

The artery and nerve defects were treated with a combined nerve- and artery-graft from the corresponding part of the amputated leg, with an arterial branch from the latter to the nerve.

2 years later the girl was able to walk without crutches, with a prosthesis on the left side. The mobility in the reconstructed, right ankle joint was good with flexion-extension 30–100 degrees. The sensibility in the sole of the foot was good with 5–7-mm two-point-discrimination and only slightly decreased neurography potential. Radiographs and MRI showed vital bone and good articular surface.

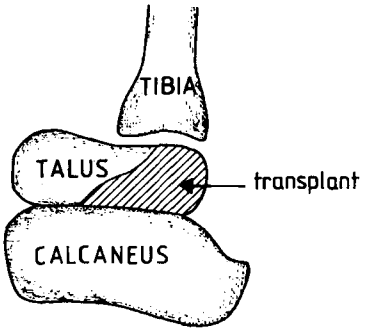
Discussion

Autogenous hemijoint transplants maintain biologic viability, but gradual deterioration of the joint surface may occur (Goldberg and Heiple 1983); 15 weeks postoperatively cartilaginous degeneration begins (Entin et al. 1962). A key point in hemijoint or whole-joint transplantation is to enable production of synovial fluid within a couple of weeks after surgery to maintain the viability of the articular hyaline cartilage and prevent its replacement by fibrocartilage (Tsai and Wang 1992). Vascularized joint transplantation appears difficult (Imamura et al. 1992).

In our case, sensibility was restored with a vascularized nerve graft and the weight-bearing, missing part of the talus had to be reconstructed. The intact 3/4 of the ankle joint gave apparently sufficient synovial fluid production to maintain the viability of the cartilage, and the vascularized beds of calcaneus and remaining talus gave sufficient mechanical support to, and provided a source for, vascularization of the bone graft. The reconstruction of a mobile ankle joint and the re-establishment of the sensibility in the planta could be done because of good donor parts in the amputated leg.

A 5-year-old girl had traumatic amputation of her right arm and left thigh and partial loss of her right ankle.

The right ankle and the destroyed left leg.



The corresponding part of the talus from the amputated left leg was formed to fill the defect. The reconstructed talus was fused with the calcaneus.

The reconstructed ankle joint 15 months after the operation.

MRI examination of the reconstructed ankle joint 2 years after the operation.

References

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