

Special Lecture 1.

Microsurgical Reconstruction of the Upper Limb

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Microsurgical procedure has many advantages for reconstruction of an injured or diseased limb, especially of an upper limb.

Free vascularized transfer of composite tissue with its overlying skin is a reliable technique for obtaining full thickness soft tissue covering of a severely injured upper limb when more conservative procedures, such as the use of skin graft or local muscle flaps, had failed or were not feasible.

The advantages are that it requires only a one-stage operation, that early movement of the injured site is possible to prevent postoperative stiffness, that the grafted skin and subcutaneous tissue are durable, that a vascularized bone graft can be performed simultaneously and that primary closure is usually possible at the donor site.

A simple skin flap could be transferred to cover an open wound of the limb, but a sensory flap or a special flap such as a nail-skin, tendon-skin or muscle-skin flap is a much better donor for reconstructing the function of the upper limb.

When appropriate, the wrap-around procedure was the method of choice for thumb reconstruction because the great toe is preserved.

This procedure provides length, stability and adequate sensibility for a functional pinch and grasp. All patients managed to regain protective sensation and available two-point discrimination. The sensory return to wrap-around flap on the thumb is often greater than for the same area on the opposite foot. The donor site of the wrap-around flap is acceptable esthetically and functionally in open-toed shoe styles worn by young women. The wrap-around technique represented an esthetically and functionally good procedure of thumb reconstruction for amputation at the level of the metacarpo-phalangeal joint or distal to it.

The cosmetic effect of a second toe transplant might be inferior to the microvascular surgery with preservation of the blood supply, osteocytes in the graft can survive, permitting rapid healing at the graft-recipient bone junction and early hypertrophy of the grafted bone segment without the replacement of the graft by creeping substitution.

The dorsum of the hand and forearm has tendons surrounded by a loose areolar tissue between the bone and thin, pliable skin.

Crushing injuries in this region could be satisfactorily reconstructed by partially-vascularized single stage approaches or completely-vascularized single stage approaches.

Partially-vascularized tissue single stage reconstruction involves a technique that combines the nonvascularized tendon graft with free tissue transfer.

A completely-vascularized single stage approach means that the tissues within it (skin, tendon, muscle, bone) are transferred as a vascularized compound flap.

By using the silastic sheet between the free grafted tendons and bony surface to form the pseudosynovial membranes, the results of free tendon graft combined with free-vascularized flap reconstruction (partially-vascularized tissue single stage approach) is favorable compared with that of the vascularized tendocutaneous flap approach.

We used segmental resection and replantation for large primary malignant or aggressive tumors of the upper limb.

Segmental resection and replantation is a new method of partial limb salvage for large primary malignant tumors for which, because of their extent, amputation would be the treatment of choice.

In conclusion, microsurgical technique is very valuable for the reconstruction of tissue defect or function loss of the upper limb.

Special Lecture 2.

Microsurgical Reconstruction Following Resection of Malignant Bone and Soft Tissue Tumor

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Since November 1983 to September 1998, we have done microsurgical reconstruction following tumor resection on 68 patients with malignant bone and soft tissue tumors. I will talk about the surgical procedures and the outcome of these 68 cases.

Patients

35 were male and 33 were female. The average age of the patients was 33.3 (range; 9~82). 60 cases were primary malignant tumors, 3 were metastatic bone tumors and 5 were aggressive tumors.

54 cases were bone tumors and 14 were soft tissue tumors. The histological diagnosis was as follows: 31 osteosarcoma; 11 malignant fibrous histiocytoma; 6 chondrosarcoma; 5 angiosarcoma; 3 giant cell tumor of bone; 3 metastatic bone tumor; 2 chondroma; 2 Ewing's sarcoma; 1 desmoid; 1 dermatofibrosarcoma protuberans; 1 malignant melanoma; 1 fibrosarcoma; 1 diagnosis undetermined.

Reconstructive Procedures

74 grafts used for reconstruction were as follows: 50 free vascularized fibular graft (FVFG), 8 Pedicle latissimus dorsi flap (LD flap); 8 pedicle vascularized fibular graft (PVFG), 3 free muscle graft; 3 other pedicle vascularized flap; 1 free LD flap; 1 free fillet flap.

Tumors of Extremities

53 grafts used for reconstruction were as follows; 41 FVFG; 8 PVFG; 3 pedicle LD flap; 1 free muscle graft.

Tumors of Pelvis and hip Joint

10 grafts used for reconstruction of pelvis and hip on 9 cases were as follows; 6 FVFG (3 pieces in 4 cases, 2