Reconstruction Gets Patients Back on Their Feet

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SCOTTHOALD, ARIZ. — Amputation of the diabetic foot can be prevented by surgical reconstruction using an anterolateral thigh perforator flap, according to a 4-year retrospective study reported by Dr. Joon Pio Hong at the 10th Annual Meeting of the Wound Healing Society.

“Despite the fact that there is still controversy over whether to amputate or salvage the diabetic foot, anterolateral thigh perforator flaps can be used to achieve independent ambulation, and free microsurgical tissue transfer can be an alternative to amputation if the vascular supply is reliable,” said Dr. Hong, a professor of plastic and reconstructive surgery at the University of Ulsan College of Medicine, Seoul, Korea.

Between 2000 and 2004, 71 diabetic patients with infected foot ulcers underwent reconstruction with an anterolateral thigh perforator flap at Ulsan Hospital. Osteomyelitis was diagnosed in 16 of the patients using clinical, radiologic, and histologic findings. Five patients had undergone peripheral vascular surgery or intervention before reconstruction, and 35 patients had confirmed peripheral neuropathy. The 50 men and 21 women ranged in age from 33 to 72 years, with an average age of 51.

Prerequisites for surgery included strict blood glucose control, close monitoring of the patients’ general condition, and relative control of infection (level of bacteria <105 cells/g of tissue). All patients required lower-extremity angiography, and patients suspected of having osteomyelitis underwent bone scanning, Dr. Hong said.

Transcutaneous oxygen measurements were greater than 30 mm Hg in patients before reconstruction. Through both a multidisciplinary approach, a diabetic foot management protocol was applied according to each patient’s needs, he said. After evaluation, 216 patients’ feet were deemed nonsalvageable.

The operation included aggressive debridement of foot ulcers and necrotic tissue and removal of nonviable bone tissue. The flap was harvested either as a perforator flap or in combination with the vastus lateralis muscle as a musculocutaneous flap.

The average length of stay in the plastic surgery department was 3.5 weeks, and additional hospitalization of 3.2 weeks was required for rehabilitation. The follow-up period ranged from 2 to 52 months, with an average of 11 months.

“Complete flap survival was noted in 66 cases, partial loss in 4 cases, and total loss in 1 case,” Dr. Hong said.

Three patients had what Dr. Hong described as “minor complications.” Of those, two showed partial wound dehiscence of the flap margin, but healing occurred without surgical management. In one patient, debulking and infection of the donor site were noted. Debridement, irrigation, and repair were required to achieve wound healing.

Partial flap loss occurred in four cases; of those, three required secondary skin graft procedures and eventually healed, but the fourth required below-knee amputation because of exposure of vital structures of the distal foot, Dr. Hong said.

Partial weight bearing began an average of 3.5 weeks after the surgery and bipedal gait began at 6 weeks, Dr. Hong said. Unassisted bipedal gait was noted in 68 cases. One patient with a previous below-knee amputation of the right leg achieved full weight bearing with the reconstructed left foot and prosthesis.

“In cases where sensation of the foot was normal, a sensitive flap was used. In these patients, protective sensation was observed as early as 4 months, with a positive response to the 5.07 Semmes-Weinstein monofilament test,” Dr. Hong said. Among the 34 patients who were employed, 25 returned to the same job and 1 found new jobs.

“However, controversy remains regarding which flap—muscle flap with skin grafts or fasciocutaneous flap—offers the optimal solution for reconstructing the foot, especially the weight-bearing surface,” he explained.

A consensus has developed supporting the thin fasciocutaneous flap as being advantageous for reducing bearing, providing a better contour, and increasing the chance for reinnervation. “However, clinical experience with fasciocutaneous flaps for reconstructing the foot has shown that the layer between the skin and the fascia may not be anatomically sufficient to prevent gliding of the skin when pressure is applied,” he said.

Although a longer follow-up period should confirm the efficacy of the microvascular salvage procedure, a high degree of success can be achieved with strict patient selection and guidelines,” Dr. Hong concluded.