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DISCUSSION - DISTALLY BASED SUPERFICIAL SURAL ARTERY FLAP

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Ashish Gupta and co-authors have written up their experience in the usage of 12 Superficial Sural Artery Flaps for the coverage of raw areas in the lower third leg, ankle and foot. The flap size ranged from 5x4 cms to 10x10cms. Three flaps with larger dimensions had marginal necrosis, but all flaps very well served the reconstructive goal.

This is a very reliable flap. With an experience of 55 flaps, we have had flap problems only in 2 cases, which on retrospective analysis were found due to poor case selection. Incidence of usage of free flaps for defects in the lower third leg and foot reduced by 30% in our hospital since the advent of usage of this flap. Few technical points which have been helpful are enumerated. As written in the original article[1], the flap is based on vessels which accompany the sural nerve which are in turn fed by perforators of the peroneal artery. The pre operative Doppler examination has been found to be very useful in choosing the line of the pedicle. All flaps have been done only after Doppler examination. The whole of the posterior aspect of the middle third of leg could be raised, keeping the midline as the axis and the pedicle oriented as in the pictures in the original article[1].

It is important to get the artery and the fascia in the flap. The pedicle or the flap could be dissected first. We prefer to raise the flap first. When the flap is raised first, at that level, the short saphenous vein, sural nerve and accompanying vessels are almost always in the midline. When the proximal incision is made, the short saphenous vein and sural nerve are first identified. At the level of middle third of leg the sural nerve is found between the two heads of gastrocnemius and care must be taken to lift it in the flap. The nerve is deeper than is usually perceived and after identification is tagged to the deep fascia. The attachment of the nerve to deep fascia at this level may appear to be flimsy, but as you dissect further, the attachment will get firm and the nerve gets well attached to the deep fascia.

The viability of the flap could further be enhanced by a small modification. As the pedicle dissection goes down, the deep fascia could be incised over the peroneal muscles and we could keep the perforators that arise in posterior peroneal intermuscular septum. In this way, the flap is very reliable and we have not had a single problem of either marginal necrosis or edema of the flap in the post-operative period.

One has to be sure about the integrity of the perforators if the flap has to be done in the acute stage for coverage of lower third leg defects. Gupta et al have not mentioned the injury-flap interval in their cases. The area of the perforators should not have suffered direct injury nor there should be degloving of skin in that area. Doppler is of great help in such cases. The skin and soft tissue must not be injured in that area and Doppler signals must be well elicitable. The two cases of flap failures in our series were done in the acute stage when no Doppler signals were elicitable.

The size is the limiting factor if this flap is compared with a free flap. Free flaps are still the "gold standard" for coverage of raw areas in the lower third leg and foot because they can cover any size of the defect and can be contoured according to the shape of the defect. Still the utility of distally based superficial sural artery flap could be enhanced if the defect to be covered is divided into "critical" and "non-critical" areas. By "critical" is meant areas where flap coverage is mandatory and "non-critical" is meant raw areas adjacent to critical areas but which will nevertheless accept grafts.

The flap will reach comfortably upto the middle of foot on the dorsum and cover the whole of the heel. This flap has particular advantage for the heel coverage because when properly shaped, the flap and sole skin heal very well. A free muscle flap with a skin graft on it sometimes leads to hypertrophy at the margin of skin graft and sole skin. This can be avoided by the usage of skin flap. Even though the flap is insensate in the heel, pressure sores have not resulted in the long term in our patients. Regular wearing of footwear with microcellular rubber sole is mandatory.