



Secondary vascularised hair-bearing island flaps for eyebrow reconstruction

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SUMMARY. Reconstruction of the eyebrows using a vascularised hair-bearing island flap is presented.

The quality, density and direction of growth of hair for reconstruction of the eyebrows can be selected by using free vascular bundle transfer to prepare a secondary vascularised island flap.

The concept of vascular implantation for prefabricating flaps was initially reported by Washio (1971), while Orticochea (1971) presented clinical usage of the concept for making an auricular composite flap. Erol and Spira (1980) subsequently reported their experimental study of such secondary vascularised (SV) flaps. In 1981, Shen reported vascular implantation for constructing island flaps. In 1982, Shintomi and Oura presented the free SV flap transplantation and named their flap the "muscle vascularized pedicle flap". After these papers, we reported SV flaps made by free vascular bundle transfer in 1984 and 1987 (Hyakusoku *et al.*, 1984, 1987). Erol and Spira (1990) described a mammoplasty using a SV flap made from pedicled omental flap transplantation into the subcutaneous portion of the lower abdomen.

We now report this method for eyebrow reconstruction.

Case reports

Case 1

A 40-year-old woman with flame burn scars came to our department for correction of the scar contracture and eyebrow defect of the right eyelid (Fig. 1).

The SV flap method was selected for the safe transplantation of ipsilateral retroauricular hair. The hair in this area possessed the necessary quality and density suitable for repair of the female eyebrow.

In a preliminary operation, the left inferior epigastric artery and veins were taken at a length of 13 cm as a free vascular bundle, anastomosed to the right superficial temporal vessels and the vascular bundle buried in the subcutaneous tissue along the retroauricular hair border.

Two weeks later, the vascular bundle was elevated with the hairy skin island attached to the tip of the buried bundle. This island flap was transplanted for reconstruction of the eyebrow (Fig. 2).

The flap survived perfectly and hair growth was seen without temporary loss of the hairs (Fig. 3).

Case 2

A 51-year-old man with his eyebrows lost by a burn had temporo-occipital areas which were scarred and were not suitable as donor sites for temporal island flaps (Fig. 4).

Thus a tandem type of prefabricated hair-bearing flap was planned. In the preliminary operation, the inferior epigastric vascular bundle was taken from the right lower abdominal region and was transplanted to the left temporal subcutaneous tissues after vascular anastomoses to the superficial temporal vessels. After delay procedures the tandem island hair-bearing flap was elevated 3 weeks later to reconstruct the eyebrows (Fig. 5). The flaps survived perfectly and the quality and direction of growth of the hairs were satisfying (Fig. 6). No temporary hair loss was seen.

Discussion

The application of SV flaps has been limited. I believe the method presented here to be useful in eyebrow reconstruction as it is vascularised and hair survival should be better than with free scalp grafts. It is also more useful than the temporal skin island flap because we can select the quality, density and direction of growth of the hair when implanting the vascular bundle.

The hair was not lost either temporarily or permanently after flap transfer, not only in the cases presented here but in the other cases of the hair-bearing SV flap (Hyakusoku *et al.*, 1987).

If neovascularisation between the hairy skin and implanted vascular bundle is not sufficient, hair follicular loss will occur. Thus delay procedures prior to elevating the island flap 2-3 weeks after the vascular bundle implantation are wise precautions.

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Fig. 1



Fig. 2



Fig. 3



Fig. 4

Figure 1—Case 1. Preoperative view. **Figure 2**—Case 1. The secondary vascularised island flap ready for transfer. **Figure 3**—Case 1. Postoperative view at 3 months. **Figure 4**—Case 2. Preoperative view.



Fig. 5



Fig. 6

Figure 5—Case 2. 3 weeks later the tandem island flap was elevated and transplanted for reconstructing the eyebrows. **Figure 6**—Case 2. 1 month after the second operation.

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