The Neighboring Flap Theory: A New Idea for Defect Closure Achieving Both Reducing the Defect and Confirmed Primary Donor Closure

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I**NTRODUCTION:** Covering a large defect with minimal donor site morbidity is a challenging task in reconstructive surgery. Recent advances in perforator flaps provides further alternatives. The research for angiosome or perforasome distinguishes the maximum size of each flap.[1] The maximum size with direct donor site closure is determined by its position and has individual variation. The size of flap is, of course, measured from the size of the defect. The flap size tends to be slightly larger than the defect to avoid tension on the flap after suture.

MATERIALS AND METHODS: Our new idea, flap elevation from adjacent area, enables making the defect smaller and simple in calculating the largest size of flaps. Preoperatively the perforators for flap around the defect should be detected. The pedicle of the flap should be inside the defect. The ligation test is done on the edge of the defect in the direction of the pedicle, and the maximum distance of these ligation points is the flap breadth. The length is decided as needed.

RESULTS: From April 2012 to February 2016, 8 malignant tumor excision cases were treated with this method. Among them, 3 cases were anterolateral thigh flaps (ALT) or tensor fasciae latae musculocutaneous flap for inguinal to lateral buttocks. 3 cases were anterior chest wall reconstructions by vertical rectus abdominis musculocutaneous (VRAM) flaps or thoracoacromial perforator flap. 2 cases were latissimus dorsi musculocutaneous flaps (LD) for back. In one of VRAM cases, the 35x15cm size skin paddle was divided into 2 pieces to cover 25x21cm defect. None of the flaps failed. All the donor sites were closed directly.

CONCLUSION: There are many studies about reduction in the donor site morbidity.[2,3] Especially for large flaps, reducing the width by dividing the skin paddle or combined flap enables direct closure of the donor sites.[4,5] To reduce the defect, partial direct closure is useful, but results in big dog ear. Our method enables two advantages by taking the flap from the neighboring area intentionally, because the dog ear is used as flap. If the breadth is less than the defect size, dividing the flap into some pieces is useful especially for LD, VRAM, and ALT.

REFERENCES:

1. Taylor GI, Pan WR. Angiosomes of the leg: anatomic study and clinical implications. Plast Reconstr Surg. 1998;102(3):599-616.
2. Arnez ZM, Khan U, Pogorelec D, Planinsek F. Rational selection of flaps from the abdomen in breast reconstruction to reduce donor site morbidity. Br J Plast Surg. 1999;52(5):351-4.
3. Hekner DD, Abbink JH, Van es RJ, Rosenberg A, Koole R, Van cann EM. Donor-site morbidity of the radial forearm free flap versus the ulnar forearm free flap. Plast Reconstr Surg. 2013;132(2):387-93.
4. Sawaizumi M, Maruyama Y, Kawaguchi N. Vertical double flap design for repair of wide defects of the lower limb, using combined ascending scapular and latissimus dorsi flaps. J Reconstr Microsurg. 1995;11(6):407-14.
5. Sawaizumi M, Maruyama Y. Sliding shape-designed latissimus dorsi flap. Ann Plast Surg. 1997;38(1):41-5.