Usefulness of Simple-Designed Bilobed Flap for Reconstruction of Ischial Decubitus Ulcer

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Summary: The pressure ulcer of the ischial region is often accompanied by complete paraplegia in patients with spinal cord injury and is attributable to the compression and breakdown of tissue arising from constant sitting. Characteristically, a pressure ulcer of this region is circular and deep. We recently reconstructed ischial decubitus ulcer of 8 patients using simple-designed bilobed flap. In all cases, the flap survived completely without any complication. Moreover, none of the patients in this group experienced any pressure ulcer relapse during the postoperative follow-up from 1 year 1 month to 9 years. In the vicinity of the ischial region, the buttock contains the most abundant amount of fatty tissue. Therefore, for our technique, we create the first flap in the buttock neighboring the defect and the second flap on the posterior thigh. Using this approach, it is possible to cover the skin or soft tissue defect of the ischial region with the flap from the buttock having a thickness large enough to bear the patient’s weight during sitting. The first flap is arranged parallel to the gluteal sulcus, and the second flap from the thigh is moved to the first-flap donation site. This technique allows closure of the wound without producing tension along the suture line. The bilobed flap, which does not require the artery to be included in the flap, is applicable for patients with relapsing pressure ulcer having a history of surgery. Our flap operative procedure is particularly useful in the reconstruction of ischial decubitus ulcer. (Plast Reconstr Surg Glob Open 2015;3:e525; doi: 10.1097/GOX.0000000000000506; Published online 23 September 2015.)

Simple-designed bilobed flap is derived from the Limberg flap or a variation thereof, the Dufourmentel flap.1 Creating this bilobed flap is an operative procedure for single-stage closure of defect and flap donation sites through the serial creation of triangle flaps with the angle reduced by one-fourth from one to another in the area neighboring the rhomboid flap.1 We previously reported the application of this flap to repair skin defects caused by tumor resection, trauma, or scarring.2-4 We recently reconstructed ischial decubitus of 8 patients using this flap and evaluated its usefulness. These cases are reported below.

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is equal in length to one side of the rhombus. Plot point F to make the angle $\beta$ equal to $3/4$ of the angle $\alpha$ ($\beta = 3/4\alpha$). A DEFG rhombus is drawn as a result. Make point H using the same procedure, and then make point I to create an angle $\gamma$ equal to $3/4$ of the angle $\beta$ ($\gamma = 3/4\beta$). The first lobe is applied to the target skin defect, and the second lobe is turned sideways to the first donor site and reeved to the secondary donor site.

**RESULTS**

There were 8 adults with ages ranging from 34 to 75 years (mean, 57.5 years). When the past disease history was checked, 6 patients had a history of complete paraplegia due to spinal cord injury, 1 had complete paraplegia due to spinal bifida, and 1 had right leg paresis due to disseminated encephalomyelitis (Table 1). All our patients were classified as National Pressure Ulcer Advisory Panel (NPUAP) stage IV. In addition, closure with single-stage plication or rhomboid flap was deemed unsuitable. Applying our technique, the bilobed flap was freed until the pivot point and subsequently raised from the layer below the fat to close the wound. Each patient was allowed to sit 2 weeks postoperatively, and the flap survived completely without any complication in all cases. Moreover, none of the patients in this group experienced any pressure ulcer relapse during the postoperative follow-up from 1 year 1 month to 9 years.

**CASE REPORT**

Case 1: A 72-year-old man sustained an injury to the lumbar spine that occurred due to falling from a height during work, resulting in complete paraplegia. We then attempted reconstruction with our bilobed flap technique (Fig. 2A). The flap was raised from the layer below the fat and was moved without tension to cover the affected area with thick, fat tissue (Fig. 2B). The flap has survived completely. At 3 years 7 months after the operation, no pressure ulcer relapse has been observed (Fig. 2C).

**DISCUSSION**

Surgical treatment of the pressure ulcer is indicated in cases where the ulcer is deeper than the subcutaneous tissue and is expected to resolve faster by reconstructive surgery than by continuation of conservative treatment. When reconstruction with a flap is selected, the following criteria must be satisfied: (1) good blood flow in the region planned for surgery, (2) suitability of the neighboring region as a donor site, (3) flap of sufficient thickness to endure the load, (4) easy closure of the flap donation site, and (5) site amenable to reoperation upon relapse of pressure ulcer.

A bilobed flap is often used in cases where single-stage plication of skin defects is not recommended. In 1999, we devised a novel rational method to design a bilobed flap. Our design enables the tension on the flap to disperse almost uniformly while allowing blood flow to stabilize. To date, we have successfully performed this flap in cases involving relatively large defects of the face, head, and extremities.

The bilobed flap is a cutaneous flap. In surgically treated pressure sores, the results achieved with musculocutaneous flaps were comparable to those reached by closure with cutaneous flaps. We recently applied this technique to 8 patients with pressure ulcer of the ischial region. In all cases, the flap could be moved without tension and survived completely without blood flow disturbance. The pressure ulcer of the ischial region is often accompanied by complete paraplegia in patients with spinal cord injury and is attributable to the compression and breakdown of tissue arising from constant sitting. Characteristically, a pressure ulcer of this region is circular and deep. In the vicinity of the ischial region, the buttock contains the most abundant amount of fatty tissue. Therefore, for our technique, we create the first flap in the buttock neighboring the defect and the second flap on the posterior thigh. Using this approach, it is possible to cover the skin or soft tissue defects of the ischial region with the flap from the buttock having a thickness large enough to bear the patient’s weight during sitting. The first flap is arranged parallel to the gluteal sulcus and the second flap from the thigh is moved to the first-flap donation site. This technique allows closure of the wound without
producing tension along the suture line. The bilobed flap, which does not require the artery (perforating branch, etc.) to be included in the flap, is also applicable for patients with relapsing pressure ulcer having a history of surgery. In all cases, the flap survived after surgery, with no pressure ulcer relapse. Based on these case reports, our bilobed flap operative procedure is particularly useful in the treatment of ischial region pressure ulcer.

CONCLUSION

We reconstructed ischial decubitus ulcer of 8 patients using simple-designed bilobed flap and confirmed its usefulness.

PATIENT CONSENT

Patient provided written consent for the use of the patient’s image.

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