Journal of Plastic, Reconstructive & Aesthetic Surgery (2013) **66**, 239–242

JPRAS
An International Journal of Surgical Reconstruction
www.JPRASurg.com

Reconstruction of the sacral region using the lumbo-gluteal sensory flap☆

Hiroaki Kimura*, **Wakako Nasu**, **Katsuhiko Kashiwa**, **Seiichiro Kobayashi**

Department of Plastic, Reconstructive and Aesthetic Surgery, Iwate Medical University, School of Medicine, 19-1 Uchimaru, Morioka, Iwate 020-8505, Japan

Received 8 August 2012; accepted 29 August 2012

KEYWORDS
Sacral decubitus ulcer;
Flap repair;
Sensory flap;
Lumbo-gluteal flap

Summary *Purpose:* Local skin flaps are used for reconstruction of sacral decubitus ulcers because of their structural endurance against the patient's weight. However, a major concern is associated with decubitus recurrence after repair. Sensory flaps are one choice to prevent recurrence. Thus, we reconstructed sacral decubitus ulcers using Nakajima's lumbo-gluteal flap as a sensory flap.
Patients and methods: Two patients with unstable sacral scars caused by decubitus ulcers were treated operatively. Neither had spinal cord injury, and buttock sensation thus remained. The flap's proximal end was designed on the posterior iliac crest and included the lateral dorsal cutaneous branch of the fourth lumbar artery as examined preoperatively with a Doppler stethoscope. The distal end was beyond the gluteal fold in case 1, but not in case 2. We subcutaneously dissected the vascular pedicle and the superior cluneal nerve located at the proximal portion of the flap after resection of the unstable scar. We then elevated the flap beneath the fascia of the gluteus maximus of the right buttock, preserving the nerve, artery and subcutaneous tissue as one pedicle, and transferred the flap to the defect.
Results: In case 1, 2 cm of the distal end of the flap was lost. The sensation of the proximal two-thirds of the flap was identical to that of the contralateral buttock. However, the distal one-third of the flap, which was elevated from the area caudal to the gluteal fold, had insufficient sensation. Case 2 had complete flap survival and sufficient sensation in all areas of the flap. Decubitus recurrence has not occurred in 7 years in case 1 and in 9 months in case 2.
Conclusion: This flap is useful for reconstruction of sacral decubitus ulcers if sensory function of the buttock remains and may be best designed as not extending beyond the gluteal fold.

☆ This work was presented at the 11th Japan–Korea Congress of Plastic and Reconstructive Surgery in Awaji Island (Japan), 17–19 May 2012.

* Corresponding author. Tel.: +81 19 651 5111; fax: +81 19 651 8402.
E-mail address: hkimura@iwate-med.ac.jp (H. Kimura).

1748-6815/$ - see front matter
http://dx.doi.org/10.1016/j.bjps.2012.08.047

Purpose

Local skin flaps are used for the reconstruction of sacral decubitus ulcers because of their structural endurance against the patient's weight. However, the recurrence of decubitus ulcers after reconstruction is a concern. Using a sensory flap for reconstruction may prevent ulcer recurrence. We report the use of a sensory Nakajima's lumbo-gluteal flap to reconstruct sacral decubitus ulcers.

Methods

Nakajima's lumbo-gluteal flap is a fasciocutaneous flap nourished by the dorsal branch of the third or fourth lumbar artery and vein.[1] This flap can be elevated over the entire hemi-buttock and extended to the trochanter or the groin (Figure 1a). A large sacral decubitus ulcer can therefore be reconstructed by transposition of this flap. Although this flap was not originally described as a sensory flap, inclusion of the superior cluneal nerve (Figure 1b),[2] which lies close to the vascular pedicle, can provide sensation.

The proximal margin of the flap is located over the posterior iliac crest and includes the lateral dorsal cutaneous branch of the third or the fourth lumbar artery, as detected by a Doppler stethoscope preoperatively. The skin island is arranged almost vertically adjacent to the decubitus ulcer. The flap is elevated from the proximal end, with meticulous subcutaneous dissection. After the vascular pedicle and the superior cluneal nerve are dissected, the flap is elevated subfascially, preserving the subcutaneous pedicle including the vessels and nerve. Some gluteal perforators may be preserved to ensure a reliable blood supply, if the flap is long and these perforators do not limit the flap's rotation arc.

We investigated the sensory function of the transferred flaps by Semmes-Weinstein monofilament testing for light touch sensation and weighted needles for quantitative measurement of pain sensation.

Patients

Two patients with unstable sacral scars caused by decubitus ulcers were treated using this sensory flap. Neither of these patients had a spinal cord injury, and buttock sensation was therefore satisfactory, although slightly reduced in one patient.

Case 1

A 68-year-old male had an unstable scar over his entire sacral region, which had been present for 40 years. The 14 × 12-cm lesion had been caused by a prolonged period of bed rest due to acute myelitis. He was ambulatory and his buttock sensation was slightly diminished. A 9 × 25-cm flap was designed on the right buttock as described above (Figure 2a). After debridement of the sacral scar and ulcer, the flap was raised beneath the fascial plane, including the dorsal branch of the lumbar artery and the superior cluneal nerve, which were located superficial to the deep fascia, and the flap was transposed to the sacral region (Figure 2b). The distal 2 cm of the flap became necrotic after the operation due to infection and ischemia. The area was treated conservatively and there has been no recurrence of the decubitus ulcer for 7 years (Figure 2c).

Case 2

A 65-year-old female had a painful sacral scar measuring 11 × 8 cm. She had developed a decubitus ulcer when she was confined to bed with a high fever of unknown cause at 7 years of age. She had normal buttock sensation and underwent scar revision with a lumbo-gluteal sensory flap

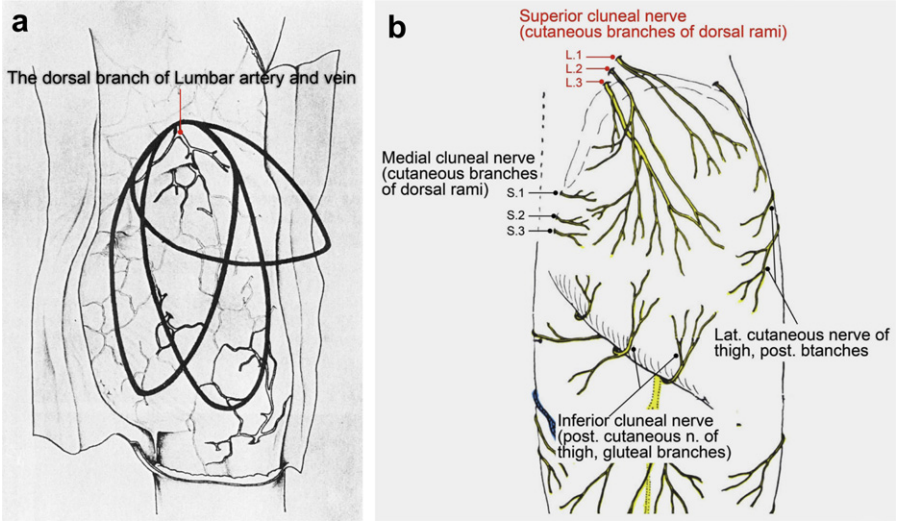

Figure 1 Anatomical basis of the lumbo-gluteal sensory flap. a. The design of Nakajima's lumbo-gluteal flap. (Nakajima H, et al. Island fasciocutaneous flaps of dorsal trunk and their application to myocutaneous flap. Keio J Med 1984; 33: 59—82.). b. Anatomy of the sensory nerves of the buttock. (Morita S, Kusunoki T. Grant's atlas of anatomy, Japanese 3rd ed. Tokyo: Igaku-Shoin, 1988: 4—8.)