Journal of Plastic, Reconstructive & Aesthetic Surgery (2006) **59**, 1415–1419

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

CASE REPORT

A prepelvic tunnel for the rectus abdominis myocutaneous flap in perineal reconstruction

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Received 12 March 2005; accepted 1 January 2006

KEYWORDS
Rectus abdominis;
Flap;
Perineal reconstruction

Summary *Background:* The use of the transpelvic vertical rectus abdominis myocutaneous (VRAM) flap in pelvic reconstruction is well documented. It can be used to fill large defects after pelvic exenteration, reconstruct the vagina and provide skin coverage in perineal reconstruction. This study examines an alternate prepelvic pathway for the flap to enhance its versatility and reliability.
Patients and method: A female patient with recurrent squamous cell carcinoma in the pelvis, who underwent radical pelvic exenteration and a successful VRAM flap reconstruction with a prepelvic tunnel.
Results: The patient experienced a small area of epithelial tip necrosis over the sacral promontory from shear forces. This healed with dressings within two weeks. There were no major flap complications and the patient had good flap integrity at one-year follow-up.

The prepelvic pathway for the VRAM flap is advantageous to the conventional transpelvic course in perineal reconstruction. The more direct, shorter path to the defect allows for a more reliable skin paddle design without the need for de-epithelialisation. A greater area of skin paddle is available and creates a more versatile flap with no tension on the pedicle. This is especially in cases where a skin paddle is needed for vaginal reconstruction or when pelvic organs such as bladder and uterus are left in situ. These advantages may result in less flap complications.

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1748-6815/$ - see front matter
doi:10.1016/j.bjps.2006.01.050

The rectus abdominis myocutaneous flap is a type III muscle flap which can be raised with a skin paddle.[1]

Use of the rectus abdominis myocutaneous flap is well documented in perineal reconstruction to provide tissue to fill dead space and support the bowel after aggressive pelvic extirpative surgery. The skin paddle also provides a durable surface that may be used to reconstruct the vagina and perineum. In wounds that may have been previously irradiated, such a well-vascularised flap has reduced the rates of complications such as wound breakdown, fistula formation, infection, and bowel obstruction.[2–4]

We investigate the use of a prepelvic tunnel which is a more direct route to the defect to shorten the distance that the flap must reach thus allowing a more reliable skin paddle design and less tension on the pedicle.

Patients and method

A 56-year-old woman with recurrent anal squamous cell carcinoma post-irradiation and chemotherapy. She underwent radical excision involving an extended abdomino-perineal resection, posterior vaginectomy and wide excision of the ischiorectal fossae; the uterus and bladder being left in situ. Histological margins were clear and follow-up duration to date has been 12 months.

Reconstruction using a prepelvic VRAM flap is performed.

The patient is placed in the lithotomy position and the skin paddle of the VRAM flap is designed to fit the perineal and vaginal defects with the medial border of the skin paddle being the midline laparotomy incision. The skin paddle of this flap extends from the pubic crest to the xiphisternum. Incisions are made down to the rectus fascia and the medial and lateral rows of perforators are carefully dissected to ensure that the skin paddle is adequately vascularised. The rectus fascia is then incised to preserve these perforating vessels sparing as much fascia as possible for donor site closure. The rectus abdominis muscle is dissected free of its sheath, the superior epigastric vessels ligated, and its insertion transected at the costal margin, leaving the VRAM flap perfused by the deep inferior epigastric vessels (Fig. 1).

A prepelvic tunnel on the ipsilateral side of the pedicle is next created by incising the perineal membrane anteriorly. Care is taken to identify and preserve the ureter. The tunnel dissection is often relatively easy as pelvic exenteration usually leaves the ischiorectal fossae empty allowing bimanual palpation on either side of the perineal membrane. The size of the aperture created to the perineum is limited to just allow the myocutaneous flap to pass through. The course and tunnel which this flap traverses is shown in Figs. 2 and 3.

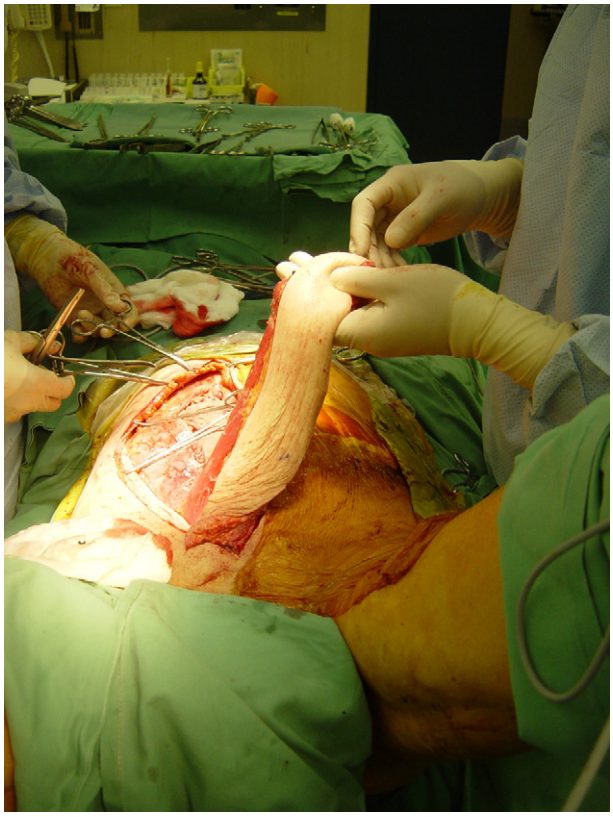

Figure 1 Elevation of the VRAM flap (Patient 1).

The VRAM flap is then detached from its origin on the pubic bone and islanded on its pedicle. Support of the pedicle is then achieved by suturing the detached muscle origin to the periosteum of the pelvic brim. The muscle is secured to the pelvic sidewalls to prevent bowel herniation and the flap is orientated such that the caudal end of the skin paddle is used to reconstruct the vagina. By detaching the origin, de-epithelialisation of the caudal end of the flap, closest to the pedicle, is not required.

If added pliability of the caudal skin paddle is required in the anterior aspect of the perineal defect, the distal 5 cm of the skin paddle may be dissected from the muscle in the subfascial plane to allow this.

The VRAM flap is then inset with dermal and subcutaneous dissolving sutures (Figs. 4 and 5). There is no tension on the skin paddle, muscle, or pedicle.

The donor defect is closed using synthetic mesh secured with a monofilament non-dissolvable suture. The skin and Scarpa's fascia are closed in layers with monofilament dissolvable sutures over a suction drain.