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The extended deep inferior epigastric flap: a case report

M. A. TONKIN, M. F. LAI and P. J. KENNEDY

Repatriation General Hospital, Sydney, Australia

Summary—The extended deep inferior epigastric flap, described by Taylor *et al.* (1983), 1984), offers a versatile and reliable technique for covering defects in the lower limb. A case of shark bite is described in which extensive soft tissue loss in the thigh resulted in a denuded femoral shaft which was successfully treated using such a flap.

Case report

An 18-year-old girl from the New Hebrides Islands sustained a severe soft tissue injury to the left thigh when savaged by a shark. This resulted in total loss of the quadriceps femoris muscle, subtotal loss of the hamstrings and loss of skin from all but the medial aspect of the thigh. The femoral shaft was denuded of all tissue anteriorly. The femoral vessels and sciatic nerve remained intact. Initial treatment consisted of debridement and subsequent split skin grafting of uncovered soft tissue.

Five weeks after the injury the patient was transferred to our care. The grafted areas were well healed but the femoral shaft remained uncovered (Fig. 1). An extended deep inferior epigastric flap was planned to obtain bone cover and the procedure was rehearsed on a fresh cadaver.

The Doppler ultrasonic probe was used preoperatively to locate the paraumbilical perforators. Angiogram studies were not performed.

At operation the necrotic outer shell of femoral cortex was removed using a burr, revealing bleeding cortical bone. A long flap measuring 32×10 cm was designed on the left side of the abdomen and chest extending from the umbilicus to the axilla in the mid-axillary line (Fig. 2). The tip of the flap, with subcutaneous fat and underlying fascial layer, was elevated to the lateral border of the rectus muscle. The flap was then carefully separated from the anterior sheath until the perforators were identified 3 cm medial to the border of the muscle. The sheath was then divided lateral to these vessels, leaving a 1 cm strip for subsequent closure. The rectus muscle was incised superiorly and dissected from the posterior sheath with a disc of anterior sheath. A 2 cm strip of anterior sheath remained medially and the

Fig. 1

Figure 1—The denuded femur at 5 weeks—note shark teeth marks. Split skin has been grafted to uncovered soft tissue.

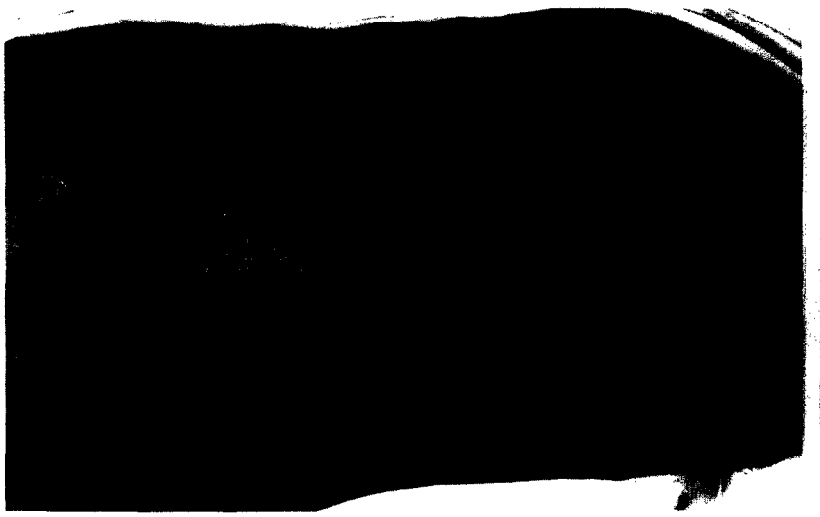

Fig. 2

Fig. 3

Figures 2, 3 and 4—Operative procedure as documented in text.

Fig. 4

inferior margin of the disc was above the arcuate line enabling primary closure.

A paramedian incision was made in the sheath inferiorly to allow the muscle and the vascular pedicle lying on its undersurface to be elevated to the point where the vessels diverged laterally towards the external iliac vessels (Fig. 3). The flap with the rectus muscle attached distally to the symphisis pubis was tunnelled subcutaneously to the ipsilateral thigh and sutured into the prepared defect (Fig. 4). The rectus sheath was closed primarily and the skin with a subcuticular suture.

Postoperatively the flap remained viable (Fig. 5). There was no evidence of deep sepsis from the bone and no abdominal herniation. Because of instability with quadriceps loss, the patient's left knee was arthrodesed. When reviewed a year postoperatively she was walking without the aid of either crutches or walking sticks. There was also no functional loss at the donor flap site. At present she leads a relatively normal life, with her left lower limb being only a little hindrance to her daily activities.

Discussion

This report confirms the versatility of the deep inferior epigastric flap in an unusual case of soft

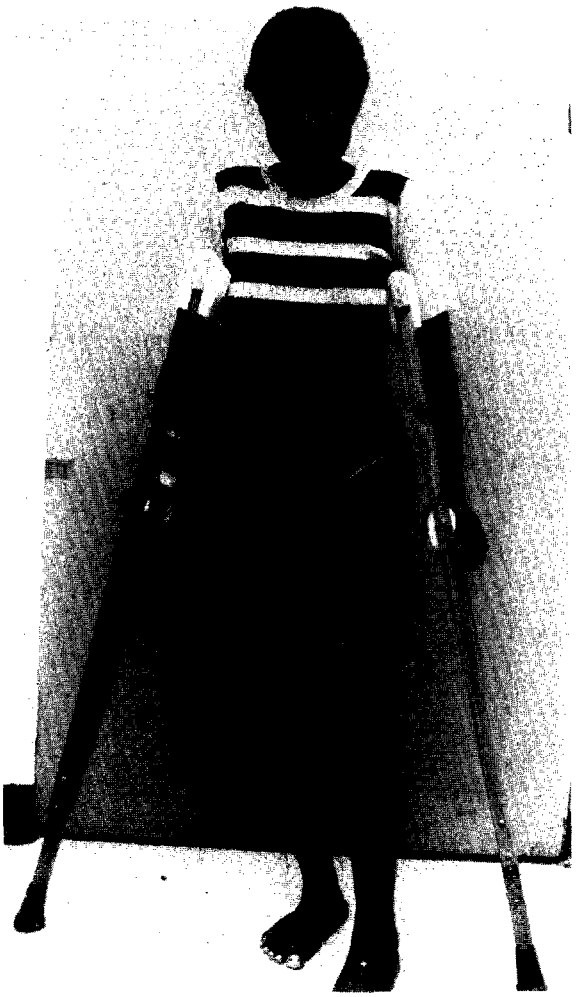

Fig. 5

Figure 5—The final result.

tissue loss. The arc of rotation extends to the knee on the ipsilateral side as suggested by Taylor. We encountered no problem with flap ischaemia or with primary closure of the donor site, although herniation through the rectus sheath distally at the site of the pedicle is a potential complication. The flap with the rectus muscle included provided some bulk to replace the quadriceps muscle loss and thus an improved thigh contour.

Acknowledgements

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The authors

M. A. Tonkin, FRACS, FRCSEd.(Orth.), Visiting Orthopaedic and Hand Surgeon, Repatriation General Hospital.

M. F. Lai, FRACS, FRCSEd, Visiting Plastic Surgeon, Repatriation General Hospital.

P. J. Kennedy, FRACS, Director, Emergency Accident Centre, Repatriation General Hospital.

Requests for reprints to: Mr M. F. Lai, Suite 27, Ashley Centre, 1 Ashley Lane, Westmead, NSW 2145, Australia.

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