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Use of an abdominal rotation flap for inguinal lymph node dissection

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Summary—In order to reduce the incidence of skin edge necrosis following dissection of the inguinal lymph nodes, an abdominal rotation flap has been used to help with closure. This allows excision of the most vulnerable skin, and closure without tension. Our experience in 13 groin dissections is presented, with skin edge necrosis in one patient (7.6%). This is compared with previously reported series and the reasons for the precarious blood supply to the skin following groin dissection are discussed.

Basset (1912) popularised the operation of block dissection of the groin and since then various technical manoeuvres have been reported which try to reduce the incidence of skin edge necrosis and wound breakdown following this operation.

Pack and Reckers (1942) described a technique involving the excision of a wide ellipse of skin over the groin which, they suggested, both lessened local recurrence and avoided the inevitable sloughing of the skin. Despite this primary skin excision, they mentioned delayed healing in 40% of their 122 cases, with 20% requiring secondary skin grafting.

Baronofsky (1948) used an incision 5 cm below and parallel to the inguinal ligament without excising any skin unless it was involved with tumour. He achieved 100% primary healing in his 8 cases. He was also the first to describe the transposition of sartorius to cover the femoral vessels in order to reduce the dead space and protect the vessels. He attributed this manoevre to Wangensteen.

Various minor modifications to the above two techniques have been described, all of which have used a more oblique or vertical incision, giving better access to the iliac nodes but resulting in high morbidity rates. Byron *et al.*, (1962) excised 1 cm of skin from either side of the wound prior to closure, with a necrosis rate of more than 40% in 83 groin dissections. Fortner *et al.*, (1964) published 220 cases of groin dissection for malignant melanoma with a necrosis rate of 64%; 22% required secondary skin grafting. They did not describe their technique in detail. In a series of 17 cases, Whitmore and Vagawala (1984) experienced a necrosis rate of 25%, with one patient requiring secondary skin grafting. They excised an ellipse of skin parallel to and below the inguinal ligament but used a vertical midline incision to gain access to the pelvic nodes. They also described scrotal flaps and relaxing incisions to take the tension off the wound edges in an attempt to reduce the morbidity. Recently, Vordermark *et al.*, (1985) have reviewed the techniques used in the past 10 years in their centre and concluded that excision of a vertical ellipse of skin 4 inches wide gave the lowest morbidity rate at 21%. They also suggest that the defect may require closure with a musculocutaneous flap or split skin graft to avoid tension.

The abdominal rotation flap used for the closure of the groin defect was originally described by Lee (1955). This flap is an early example of an axial pattern flap based on the lower abdominal midline perforating vessels.

The poor healing following the operation of groin dissection has been variously attributed to the presence of a large dead space in the femoral triangle, thin skin flaps and the presence of bacteria within the lymph nodes from the anus and perineum. To these we would add the most significant factor, which is the interruption of the blood supply to the skin of the area. The blood vessels supplying the skin of the groin and femoral triangle are the superficial external pudendal, the superficial circumflex iliac and the superficial epigastric vessels. They are all divided close to the femoral artery during dissection (Nakajima *et al.*, 1981).

Surgical technique

Excision of vulnerable skin edges alone overcomes one problem but creates another. If the elliptical

excision is parallel to the groin crease, the tension resulting from the excision can be relieved by temporary hip flexion, but such an approach inhibits radical clearance of the femoral triangle and limits extension of the dissection upwards along the external iliac vessels. For that reason, we prefer a vertical component in the thigh, bisecting the femoral triangle, and a larger rotation flap 5 to 7 inches in diameter which is based medially in the iliac fossa (Fig. 1).

Near the incision in the thigh, the skin is undermined superficially—the amount being dictated by the needs of tumour clearance. The undermining continues more deeply further away from the skin edge.

After dissection of the femoral triangle a finger is inserted through the femoral canal and if nodes can be felt beside the external iliac artery, the inguinal ligament is divided and the dissection is continued upwards. This dissection is facilitated by reflection of the abdominal flap which is raised superficial to the deep fascia.

After completion of the dissection, the sartorius muscle is divided near its origin, transposed medially and sutured to the inguinal ligament in order to provide cover for the femoral vessels (Fig. 2). The femoral canal is obliterated to prevent a hernia. Two triangles of thin upper thigh skin are excised and this excision is continued down the wound edges (Fig. 3). The abdominal flap is rotated downwards. Closure is completed with the hip flexed, a position which has to be maintained postoperatively. Suction drains are used (Fig. 4).

The defect higher up the abdomen resulting from movement of the flap is closed by medial advancement of loin skin and excision of the dogear. A skin graft has not been necessary.

Suction drainage has been continued until lymph drainage is less than 10 ml in 24 hrs. Repeated aspiration of lymph may be necessary, but the tendency for lymph to collect diminishes.

Results

We have used the technique in 13 groin dissections in 12 patients aged from 31 to 75 years. There were 7 females and 5 males. Histological examination of all specimens removed revealed the presence of lymph nodes containing malignant tumours.

All but one patient (*i.e.* 12 dissections) healed uneventfully. The only patient who experienced complications had postoperative bleeding following external iliac dissection and had to return to theatre. She subsequently necrosed the thigh skin margins

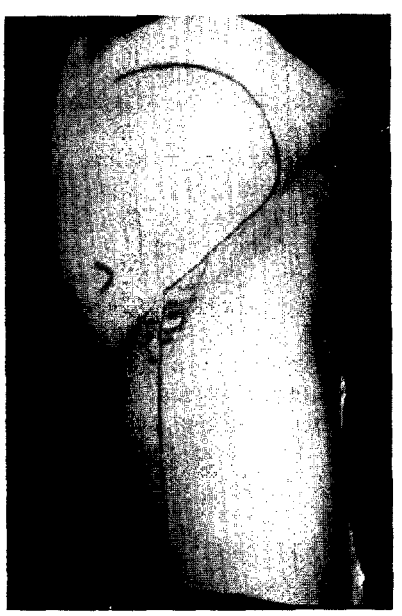

Fig. 1

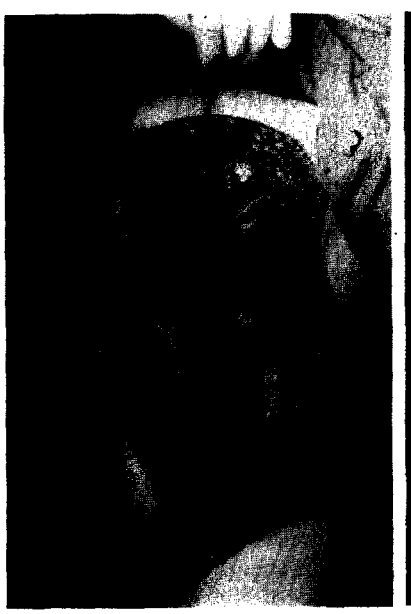

Fig. 2

Fig. 3

Figure 1—Incision. Shaded triangles are excised at end of operation—See Fig. 3. Figure 2—Dissection completed. Sartorius muscle transposed. Figure 3—Excision of vulnerable skin edges.

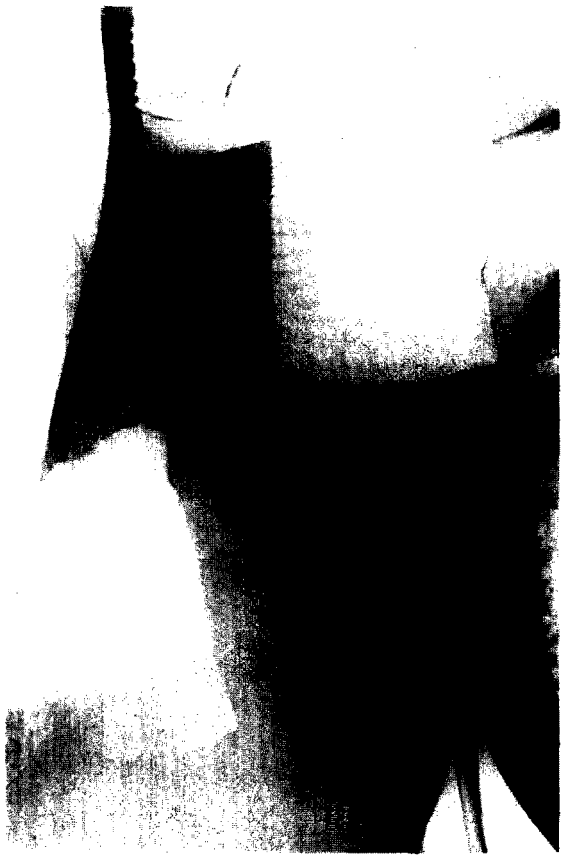

Fig. 4

Figure 4—Wound closed. (NB. Different patient who had bilateral block dissections and an aorto-iliac node clearance)

and required skin grafting, with eventual satisfactory healing.

Discussion

In this series of 13 dissections, there has been one instance of skin edge necrosis. There have been no subsequent problems with the scar, with no tendency for a contraction to occur across the groin crease. These results compare favourably with previous series. The technique assists uneventful wound healing by allowing:

(i) excision of potentially ischaemic wound edges
(ii) the introduction of well vascularised skin
(iii) suturing of the wound without tension
(iv) the elimination of the dead space.

Finally, the approach satisfies surgical requirements by providing access to the external iliac lymph node chain.

Acknowledgement

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