

The rectus abdominis flap for perineal wounds

H S SHUKLA FRCSE*
Senior Lecturer in Surgery

L E HUGHES FRCS
Professor of Surgery, Welsh National School of Medicine, Cardiff

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Summary

The use of an inferiorly based rectus abdominis myocutaneous flap taken through the pelvis is described. It provides rapid healing of large perineal wounds following excision of advanced perineal malignancy or rectal excision in association with radiotherapy.

Two cases were completely satisfactory, but the flap was lost in the third case because of delayed venous thrombosis. It is recommended that the rectus muscle below the entry of the inferior epigastric artery is not completely divided to prevent kinking of the vessels.

Introduction

The rectus abdominis myocutaneous flap was first reported by Mathes and Bostwick (1). Since then its use has been extended to a wide variety of indications related to the front of the trunk and groin region (2, 3).

The perineal wound after abdominoperineal excision usually heals without undue difficulty, if somewhat slowly on occasions. However, there are particular situations where more rapid or certain healing may be desirable. Very large wounds with too wide a gap for primary closure may take many months to heal, and rapid, certain healing may be especially desirable before or after radiotherapy. We report a technique for such cases using an inferiorly based rectus abdominis myocutaneous flap, taken through the pelvis to the perineum.

Technique

Rectus myocutaneous flap The rectus abdominis muscle is remarkable for the presence of dual, superior and inferior vascular pedicles each of which is adequate for the survival of the muscle and the overlying skin (Fig. 1). Of the two, the lower pedicle, formed by the inferior epigastric vessels is the larger and better defined and can be easily found entering the muscle laterally, 4–5 cms above the pubis. The full width of the rectus muscle can be divided inferior to the entry of the vessels to convert it into a true island flap, although this increases the hazard of kinking of the vessels where these are angulated. This flap has the versatility of rotation over a wide area.

Technique of operation The patient is positioned in the Lloyd Davies position for abdominoperineal resection. An ellipse of skin corresponding to the area of perineal skin excision is marked out in the epigastrium (Fig. 1). The site of the end colostomy is marked. The skin flap is raised in continuity

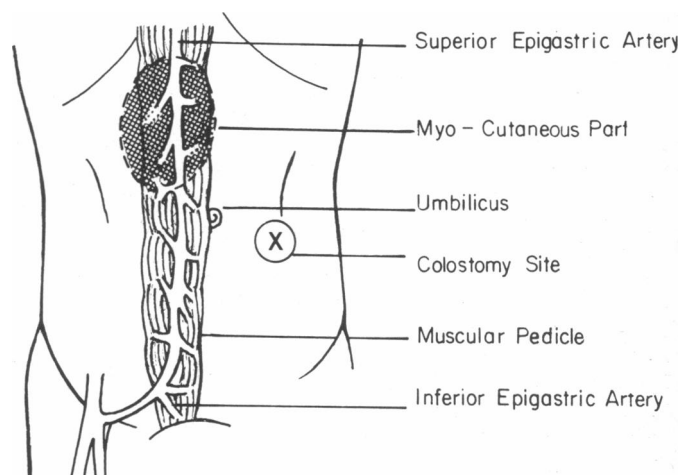


FIG. 1 Rectus abdominis myocutaneous unit. Island of skin is shown.

with the underlying anterior rectus sheath and rectus muscle. Below the skin island the anterior sheath is opened as a right paramedian incision and the rectus muscle mobilised from within the sheath, taking special care to preserve the inferior epigastric vessels.

The muscle is divided above the skin island (with ligation of the superior epigastric vessels) but is preserved, at least in part, below the entrance of the inferior pedicle (Fig. 2). A few sutures are placed between subcutaneous tissue and muscle to prevent a shearing effect on the perforating vessels, and the myocutaneous flap is placed in a plastic bag while the rectal excision is performed. The abdomen is opened through the posterior rectus sheath and the abdominoperineal resection proceeds in the usual way with a synchronous abdominoperineal approach. After the rectum has been removed our practice is to irrigate the pelvic cavity with an antibiotic/saline solution. The rectus abdominis myocutaneous unit is then passed through to the perineum, the rectus muscle lying in the pelvis. Care is taken not to twist the pedicle although in the process it is folded on itself. The cutaneous part is stitched to the perineal skin directly and in females the skin island can be used to repair the posterior vaginal wall. The perineum is drained with suction drainage. The pelvic peritoneum is best left open but can be closed around the muscle.

The rectus sheath is closed with great care using interrupted nylon horizontal mattress sutures, with each limb of

Address for Correspondence: Professor L E Hughes, Department of Surgery, Welsh National School of Medicine, Cardiff

* Present address: Banares Hindu University, India.

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FIG. 2 Rectus abdominis myocutaneous flap mobilised on the inferior pedicle. We now recommend that more of the rectus muscle be left intact beside the vessels to lessen the risk of vascular kinking.

the suture placed as a figure-of-8, and incorporating large bites of linea alba and lateral sheath. Pressure on the pedicle is avoided when closing the lower part of the wound.

Case reports

(1) A 78 year old female was referred for a large fungating growth in the perineum, extending into the right buttock (Fig. 3). The mass was infected and associated with severe pain exacerbated by defaecation because of anal spasm. The right inguinal nodes were



FIG. 3 Large fungating melanoma. (Case 1)

clinically involved. Biopsy of the growth showed it to be a malignant melanoma with no evidence of distant spread. A palliative abdominoperineal resection of the rectum and the anal canal, with wide excision of the perineal skin and adjacent buttock was carried out. The right inguinal nodes with overlying skin and intervening skin was excised in continuity. The perineal and posterior vaginal defect was repaired immediately with a rectus abdominis myocutaneous flap. The inguinal portion of the defect was closed primarily. The wound healed primarily, and the patient was discharged after 2.5 weeks (Fig.4).

(2) A 72 year old retired civil servant presented with rectal bleeding, loss of weight and symptoms of subacute intestinal obstruction for 6 months. Examination revealed 4 x 4 cm fungating fixed adenocarcinoma rectum 6 cm from the anal verge. He was given preoperative radiotherapy 4000 cGv in 4 weeks and 2 weeks later abdominoperineal resection was carried out. The perineal wound was repaired with a rectus abdominis myocutaneous flap to prevent infection and adverse effects of radiotherapy on wound healing. The wound healed primarily, apart from a temporary purulent discharge which settled spontaneously. The patient's discharge in 3 weeks was dependant upon learning the management of his colostomy.

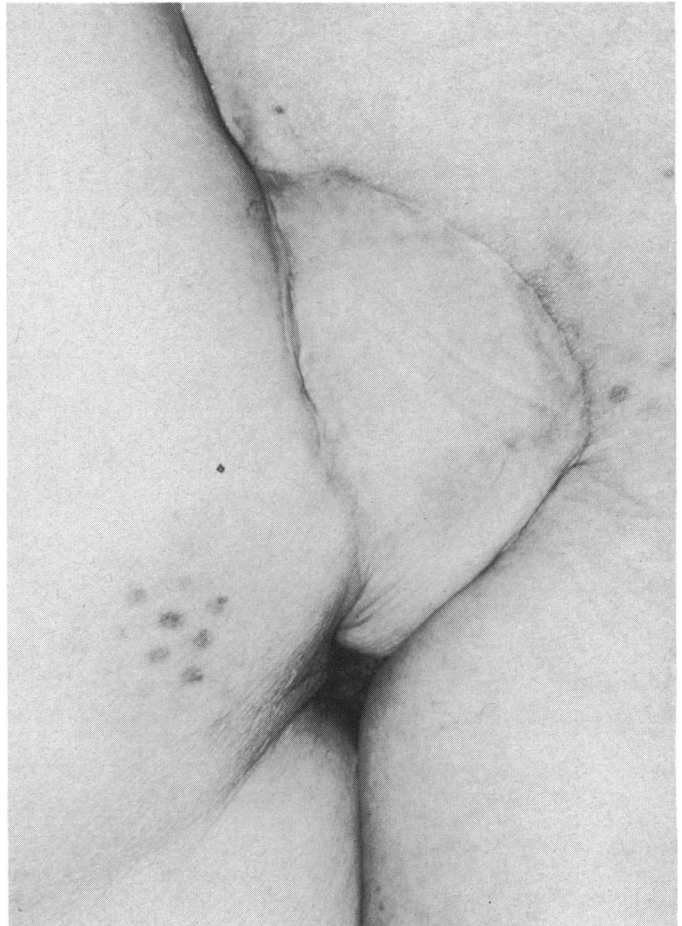


FIG. 4 Healed perineal wound after rectus myocutaneous flap (Case 1)

(3) An 80 year old female presented with a large carcinoma of the perineum extending forwards to involve the posterior two thirds of the vulva and posteriorly to involve the anal sphincter and rectovaginal septum. Abdominoperineal excision of the rectum was combined with vulvectomy and excision of all except the anterior wall of the vagina. An inferiorly based rectus myocutaneous flap, which was converted to a complete island flap by dividing the muscle below the entry of inferior epigastric artery was used. The flap was satisfactory for 24 hours, but then suddenly developed cyanosis and oedema which went on to gangrene of the skin and distal muscle. Immediate exploration at 24 hours showed good arterial pulsation, but evidence of venous thrombosis. Surgical débridement was followed by rapid healthy granulation of the wound, but the patient died suddenly of massive pulmonary embolus after 3 weeks.

Discussion

There are several operations where particular problems of healing of perineal wounds call for a special surgical approach. Very large fungating tumours may be best palliated by radical excision, but if the patient is to benefit from his palliation, he must be assured of rapid healing and early discharge. The large bulk of well vascularized muscle and subcutaneous tissue in this flap eliminates dead space in the pelvis, and the equally well vascularised skin island provides primary healing. Hence, the patient is fit for discharge as soon as he can manage his colostomy.

A second situation is where radiotherapy is used in combination with surgery. Where postoperative radiotherapy is planned for large tumours rapid healing with a myocutaneous flap allows early radiotherapy to well oxygenated tissues. Where radical surgery is required for recurrence following radiotherapy, the flap will alleviate the problems of poor healing of irradiated tissue.

There are two main alternative methods to the inferiorly based rectus flap. Omentum has been used by a number of

workers to fill the pelvis, and although useful, it does not provide primary healing of large skin defects. The gracilis myocutaneous flap has been recommended for the same purpose, but in our experience this is the least reliable of all myocutaneous flaps, and we have abandoned its use except as a last resort, or where a skin island is not essential.

The inferiorly based rectus flap is completely reliable in our experiences of its use for groin and abdominal defects and has again proved so in our first two cases of transpelvic routing to the perineum. It appears from our third case that the rectus muscle below the entry of the inferior epigastric artery should not be completely divided to prevent kinking of vessels which can endanger the flap. Barring major loss of the flaps it is much more reliable than the superiorly based

flap, where some loss of skin and some fat necrosis is not uncommon. We believe that this technique provides the best means for dealing with difficult perineal wounds where tissue bulk and rapid healing are desirable.

References

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Sir Astley Cooper's case of ligation of the abdominal aorta

The following account of the first operation for ligation of the aorta comes from a letter written by Edward Osler who was a medical student at Guys in 1816-18. The letter was found by his nephew William Osler and published in the *Guys Hospital Gazette* of 8th July 1911, p 277. The letter is dated 5th July 1817.

It (the aneurysm) began about twelve months ago and has been gradually increasing. From the size, the situation, and from no pulsation being felt at the femoral artery, no doubt was entertained that it was an aneurysm of the external iliac artery very high up. Cooper thought of tying the common iliac, but I believe was afraid. I mentioned that I could indistinctly feel the descending branch of the external circumflex, and it is probable I was correct, as one of the branches probably formed a large anastomosis with one of the vessels of the pelvis. Towards the end of May every part was very hard except one spot, which was soft and fluctuating like an abscess. About the middle of June a line of ulceration began to appear, which extended, and at last formed an eschar as large as a crown piece. On the 24th of June (Tuesday) Cooper saw him. After he had looked at him he sat by his bedside for a few minutes buried in thought, without speaking to anyone. At last he started up with a smile (you know his look!), 'I'll do it, but I'll wait for hæmorrhage.' He had not long to wait. On Wednesday afternoon the patient lost eighteen ounces of blood, and Cooper was sent for. He had taken a subject in the dead-house and operated on it through the abdomen and from the side (for the iliac). The first he found easy, the other utterly impracticable. The patient was brought to the theatre, and Cooper made an incision immediately above Poupart's ligament, just large enough to introduce his finger that it might plug the wound. His object was to find the mouth of the artery and thus command the hæmorrhage, and then cut down on it and secure it. He found, however, that the artery was ulcerated higher than he could reach, and that the common iliac itself was affected. He therefore had a plug to fit the wound, which he introduced on withdrawing his finger. He now determined to put a ligature on the aorta. He made a longitudinal incision, about $2\frac{1}{2}$ inches long, on the left side of the umbilicus, about an inch from the linea alba, cutting through the rectus. He introduced his finger, and pushing the intestines away felt for the aorta, tore through the meso-colon with his finger, separated the artery, and, looking round, said, 'gentlemen, I have the pleasure of informing you that the aorta is now hooked up on my finger.' An aneurismal needle was now carried down under the vessel, and it was tied with facility. The operation indeed was by no means difficult or tedious. The ligature was left hanging out at the wound, which was united by the quilled suture. A dose of tinct. opii. was administered and he had a good night. On Thursday he was very cheerful and sanguine in his hopes of recovery. Both limbs were nearly of the natural temperature; he had no affection of the head or pain in the abdomen. Even Mr Cooper and Mr. Travers had very great hopes of him, as the circulation was evidently affected in the inferior extremities. His pulse was above 110, of natural strength, and there was no throbbing of the carotids. When I went to see him on Friday morning, after writing you, a great change had taken place. His pulse was above 120 and weak, not at all thready, but above the natural fulness and very soft and feeble, as if the artery were not half full of blood. His face was pale and contracted, his eyes dull and heavy, and he seldom opened them; his left leg was cold, as were his extremities. He had passed a restless night and had slept very little. At one o'clock he died."

Erichsen's comment may be quoted:—"It is impossible not to contemplate with admiration the man whose mind was the first to conceive, and whose hand was the first to carry out, the determination to apply a ligature to the abdominal aorta."

WILLIAM OSLER.

Oxford, June 24th, 1911.