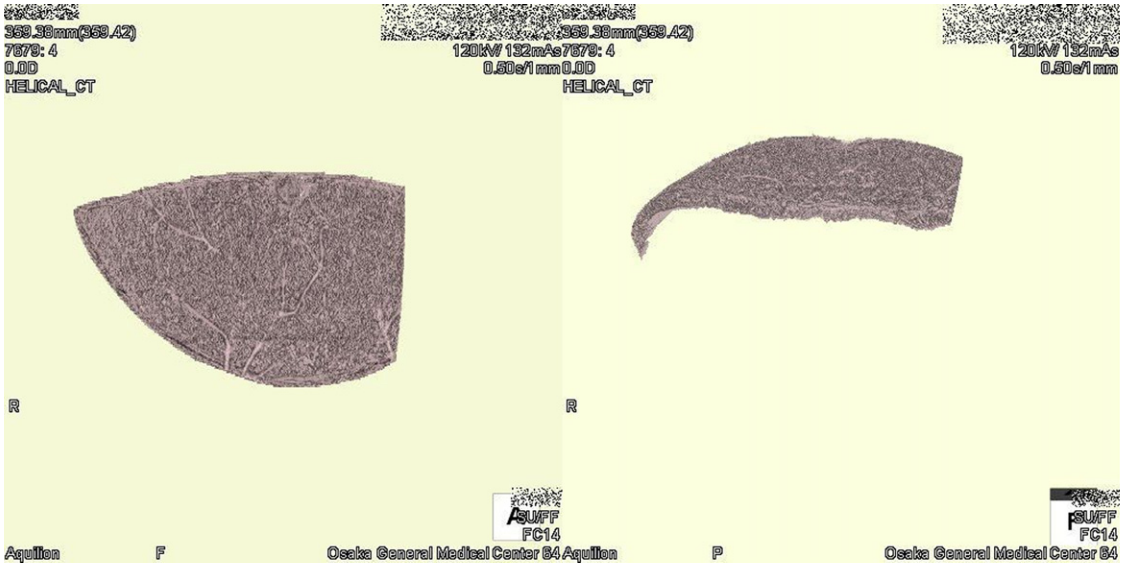

Figure 2 Using a workstation, three-dimensional image of the flap can be applied to any arbitrary flap size preoperatively.

Pre-expanded bipedicled deep inferior epigastric artery perforator (DIEP) flap for paediatric lower limb reconstruction

Dear Sir,

We would like to present a challenging case, successfully managed with a unique combination of operative strategies, relying on basic principles. A 16-year old caucasian female with a large cutaneous neurofibroma on the right lower limb measuring 26 × 19 cm, presented for excision and reconstruction. A diagnosis of type 1 neurofibromatosis was made based on the presence of a large cutaneous neurofibroma, multiple typical neurofibromas, more than 6 large café-au-lait spots and iris hamartomas (Lisch nodules). She had no other previous medical history and no previous surgery. Due to the size of the defect and the need for a large pliable fasciocutaneous flap, a lower abdominal flap was planned, however the patient's low body mass index (BMI) and lack of abdominal tissue suggested that closure of the donor site would present a problem. Other reconstructive options entertained in this setting included an anterolateral thigh flap, although the donor site was considered sub-optimal, and other flaps such as the groin flap would not have spanned the defect. A pre-expanded, bipedicled free 'stacked' deep inferior epigastric artery (DIEP) flap was thus selected as the option of choice.

An operative plan was conceived to place osmotic self-inflating tissue expanders both under the flap and under the upper abdominal skin to allow primary closure of the donor site. In order to visualise the abdominal wall perforators, and allow safe osmotic expander placement, a pre-operative computed tomographic angiogram (CTA), using a protocol previously described,[1] was performed. The CTA showed a type 2 (bifurcating) deep inferior epigastric artery (DIEA) and vein (DIEV) on the left and type 1 (single trunk) on the right, with two major periumbilical perforators selected for preservation, a 1.3 mm perforator 1 cm to the left and 3 cm below the umbilicus, and a 1.3 mm perforator 2 cm to the right and 3 cm below the umbilicus (see Figure 1).

The osmotic expanders were placed in situ, both in the upper abdomen (to allow donor site closure) and lower abdomen (for fasciocutaneous flap expansion), as shown in Figure 2. After removal of the expanders, the flap was raised on each of the two preserved perforators, with dissection of each DIEA and DIEV pedicle, and an intra-flap anastomosis was performed between the right DIEA and DIEV and the lateral branch of the left DIEA and DIEV (see Figure 1). The primary flap anastomoses of the left DIEP pedicle were to the descending branch of the lateral circumflex femoral artery and vein at the recipient site. Appropriate primary closure of the abdominal donor site was achieved, and the flap was inset, with no postoperative issues or complications. The patient was discharged on day 5 post-op, and the wounds had healed at two weeks follow up (see Figure 3).

This case has several discussion points of interest to the reconstructive surgeon. Satisfying recipient-site prerequisites must always be the priority in any flap selection, but donor-site morbidity should also be an essential concern, especially in this era of outcome awareness.[2] This is particularly true for fasciocutaneous flaps. We selected the flap to both give the best cosmetic result and minimise donor site morbidity. Although a pre-expanded anterolateral thigh flap was considered,[3] we were mindful of the evidence that expanders in extremities have a higher complication rate,[4] while expansion of the abdominal wall has been done with some success previously.[5] Other

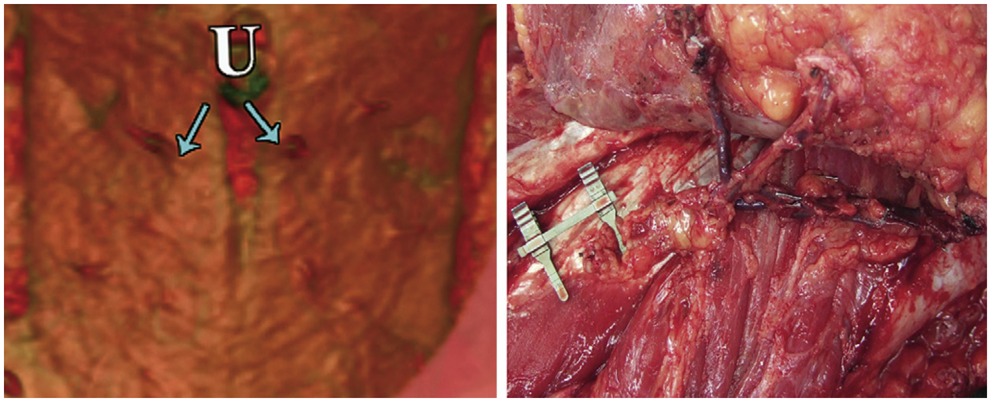

Figure 1 Preoperative computed tomographic angiogram (CTA) highlighting a single large periumbilical perforator supplying each hemiabdominal wall integument (left). The two preserved perforators are shown (right), on which the abdominal flap was raised, with dissection of each deep inferior epigastric artery (DIEA) and deep inferior epigastric vein (DIEV) pedicle, and an intra-flap anastomosis performed between the right DIEA and DIEV and the lateral branch of the left DIEA and DIEV (after expansion).

options were considered, but given the limitations of this correspondence, we will not review all of the options described in the literature. The use of osmotic expanders has been met with mixed feelings since its first description in the literature.[6] Some authors have advocated its use,[7,8] whereas others highlight high complication rates,[9] especially in the paediatric population.[10] First generation expanders consisted of a copolymer hydrogel, however this was later wrapped in a perforated silicon envelope to regulate osmotic speed. It is of note that authors advocating its use used the second generation variety. We have had some experience of osmotic expanders previously, and have been impressed with their versatility and the attraction for the paediatric patient cohort, in that repeated injections are not necessary for expansion. The only problem we have encountered with them is the speed of expansion which is inherently not under surgeon control. This has only previously been of concern for a less robust fascial flap in head and neck reconstruction.

We advocate the use of osmotic expanders in the paediatric population to remove the need for repeat expansion visits and the use of pre-operative computed tomographic angiography to both allow safe placement of

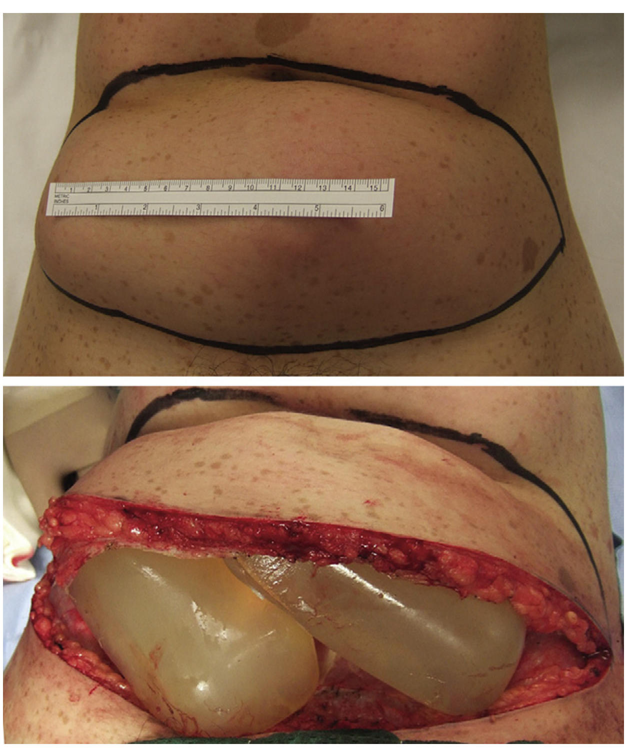

Figure 2 The osmotic expanders placed beneath both the upper abdominal and lower abdominal wall soft tissues, in order to achieve donor site closure as well as flap expansion (above). Removal of the expanders after osmotic expansion is shown (below).

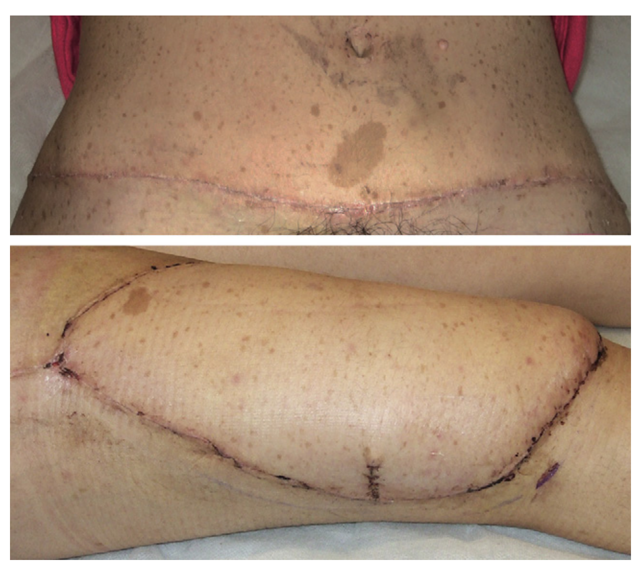

Figure 3 The abdominal donor site was closed primary (above), and the flap was inset to suitably fill the defect (below), with completely healed wounds at two weeks postoperatively.

the expanders, and also to plan to the intra-flap anastomosis (the strategy for 'stacking').

Conflicts of interest

None.

Disclosures

Iain Whitaker was involved while on a Rowan Nicks Fellowship funded by the Royal Australasian College of Surgeons.

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Extended Sublay repair: A modified open technique for lumbar hernias

Dear Sir,

Lumbar hernias are rare but complex defects that may be congenital or acquired in the area bordered by the 12th rib superiorly, the iliac crest inferiorly and the erector spinae medially, representing no more than 2% of all the abdominal hernias. Acquired lumbar hernias are commonly secondary to surgery, trauma, or infection. Incisions in the lumbar region to access to kidney, aorta, iliac crest are the main cause of acquired lumbar hernia. Lumbar hernias may be asymptomatic or present as a growing mass. Most severely, they have a 25% risk of incarceration and an 8% risk of strangulation, which necessitates early surgical intervention.[1] However, their relative rarity and anatomical complexity render these lesions to be managed in a variety of nonstandardised ways, such as primary suture repair and rotational muscle flaps. We have successfully employed a modified open technique of extended Sublay repair to deal with lumbar hernias.

Under general anesthesia, the patient is positioned in the lateral decubitus positon with the hernia side up at 45°. This position allows for adequate visualisation of paraspinus muscles posteriorly and rectus abdominis anteriorly. An oblique incision overlying the defect is adopted, taking care not to compromise intercostal space. The hernia sac and the orders of the defect are exposed totally, followed by extraperitoneal space preparation. If necessary, the adjacent structures including serratus posterior inferior posteriorly, and external and internal oblique anteriorly and latissimus dorsi posteriorly, could be partially desected for better visualization. For obtaining adequate extraperitoneal space, preparation in the cranial aspect should reach the posterior of 10th rib following partial ablation of insertion of diaphragmatic muscle, in the caudal aspect reach the iliopubic tract, in the ventral aspect reach behind the posterior sheath of rectus abdominis muscle following dividing the linea semilunaris, in the dorsal aspect reach the spine. A monofilament knitted polypropylene mesh from Bard Limited, UK. Is implanted into the space to center over the defect, securing to the adjacent tissues circumferentially with intermittent absorbable sutures. The groove between the psoas and quadratus lumborum, as well as the region lateral to iliopubic tract, must be spared to avoid nerves entrapment. The ureter on the psoas should be identified and preserved. The transfascial sutures through the rectus abdominis medially, sutures on the Cooper's ligment inferiorly and costal arch superiorly are very critical to hold the mesh. A drain is placed superficially. The subcutaneous and skin closure is performed in routine fashion. (Figure 1).

Sublay technique, mesh implanted into retro muscular and prefascial space, is the most promising procedure for many types of ventral hernias with comparatively low recurrence rate and reduced complications. Moreno-Egea