Concomitant sublay mesh repair of umbilical hernia and abdominoplasty

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Concomitant mesh repair of large umbilical hernias and abdominoplasty pose a serious risk of devascularizing the umbilical stalk. A technique of placing mesh in a sublay manner, deep to the fascial defect, for an umbilical herniorrhaphy to avoid damage to the deep umbilical perforators during an abdominoplasty is described.

Key Words: *Abdominoplasty; Retrorectus; Umbilical hernia*

Umbilical hernias are occasionally present in patients desiring abdominoplasty. Current data strongly support the use of synthetic mesh when repairing ventral hernias >3 cm in diameter. Long-term data demonstrate improved recurrence rates with mesh, even for smaller umbilical defects (1,2). With simultaneous abdominoplasty, an open approach to umbilical herniorrhaphy is preferred due to the improved exposure; however, dissection of an umbilical hernia at the fascial level can damage the umbilical perforating vessels, resulting in necrosis and loss. During abdominoplasty, circumferential skin incision around the umbilicus divides the subdermal vessels, making it dependent on the deep inferior epigastric supply. This blood supply originates from the deep inferior epigastric artery, traverses the rectus abdominus muscle and continues through the anterior rectus fascia. Traditional hernia repair, as an onlay or subfascial mesh placement, risks deep umbilical blood flow. Unilateral approach with dissection in the preperitoneal plane enables preservation of unilateral and, potentially, bilateral deep perfusion because the dissection plane is deep to the posterior rectus sheath.

We present a patient with a defect 3 cm in size at the umbilicus hernia and diastasis presenting for simultaneous open mesh umbilical hernia repair and abdominoplasty (Figure 1). Umbilical perfusion was maintained during open repair with preservation of unilateral deep perforating vessels and placement of mesh in a plane consisting of both the preperitoneal and retrorectus space.

SURGICAL TECHNIQUE

The patient was marked preoperatively for lower abdominal incision. The skin was incised and dissection was taken through Scarpa's fascia to the deep fascia of the abdominal wall. The umbilicus was incised circumferentially through the skin. The cutaneous flap was raised to the umbilical incision and the flap was split and subcutaneous dissection bevelled away from the umbilicus to the fascia and preserved periumbilical perfusion. The adipocutaneous flap was elevated to the xiphoid and medial costal margins. The anterior rectus sheath was incised over the right rectus muscle. Dissection was carried through the medial posterior rectus sheath to the preperitoneal plane adjacent to the hernia. Contents of the hernia were reduced. The contralateral rectus preperitoneal plane was dissected for placement of mesh with

La réparation d'une hernie ombilicale et une abdominoplastie concomitantes par treillis sous-jacent

La réparation d'une importante hernie ombilicale et une abdominoplastie concomitantes par treillis posent un risque important de dévascularisation de la tige ombilicale. Les auteurs décrivent une technique consistant à placer le treillis de manière sous-jacente, profondément dans l'anomalie du fascia, pour que la hernioplastie ombilicale évite d'endommager les perforateurs ombilicaux profonds pendant l'abdominoplastie.

Figure 1) Preoperative umbilical defect with diastasis

peripheral fascial overlap. The umbilical stalk and perforating vessels were preserved on the contralateral side. The peritoneum was reapproximated in the midline to 'close off' the abdominal cavity. This manoeuvre created a pocket deep to the fascia to lay mesh (Figure 2). A lightweight polypropylene mesh was used in this retrorectus position in the preperitoneal space to reinforce the midline closure (Figure 3). The mesh was secured with transabdominal wall monofilament permanent sutures. The linea alba was recreated with long-acting absorbable sutures. Midline plicating sutures were placed above and below the umbilicus. The cutaneous flap was advanced inferiorly, divided and inset. The umbilicus was inset with dermal and cutaneous sutures. Subcutaneous drains were left in place.

RESULTS

The patient was observed overnight in hospital. Pain was well controlled. Drains over the mesh and in the subcutaneous plane were removed after two weeks. The patient demonstrated rapid recovery

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Figure 2) Mesh is placed in a sublay tissue plane; retrorectus on the right and preperitoneal on the left

consistent with abdominoplasty without umbilical skin loss. She had no evidence of hernia recurrence at 12 months (Figure 4).

DISCUSSION

Simultaneous abdominoplasty with ventral or umbilical hernia repair has been demonstrated to place the umbilicus at risk, with possible impairment or loss of blood supply. Large hernias can distort normal anatomy and thin the overlying skin and soft tissue. An abdominoplasty approach lends itself to an open umbilical hernia repair. Careful planning must occur intraoperatively to determine the safe point of entry and plane of dissection of the hernia to avoid umbilical ischemia. This planning takes into consideration the size of the hernia and its location relevant to the umbilical stalk. This approach has previously been described inferiorly at the midline (3). We describe a 'right lateral' approach via the preperitoneal plane, effectively raising a left laterally based abdominal wall flap containing the umbilicus. Transabdominal wall sutures securing the mesh are strategically placed to preserve the umbilical stalk and deep epigastric blood supply.

Umbilical vascular preservation is of the utmost importance with abdominoplasty procedures. When combined with repair of an umbilical hernia, this tenet takes on added importance (4). Previous authors have described effective techniques for maintaining umbilical perfusion when the two procedures are combined. These approaches have described fascial incisions away from the umbilical stalk to preserve the perforating vessels (3). When umbilical defects measure >3 cm in diameter, the use of mesh is advocated in the literature. The best long-term follow-up data with ventral defects <10 cm² reported a significant reduction in recurrence from 67% with suture repair alone to 17% when mesh is used (2). A randomized trial using a mesh plug for repair of umbilical defects demonstrated improvement in recurrence from 11% with suture repair versus 1% for plug repair (5).

The safety of combining abdominoplasty with other abdominal procedures has been a concern. There have been reports of increases in the risk of pulmonary embolus, need for blood transfusion, length of hospitalization and minor complications when abdominoplasty is combined with other gynecological procedures (6,7). The largest series, involving more than 100 patients using concomitant abdominoplasty, showed a slight increase in the need for blood transfusion and a few more superficial wound infections. There were no deep space infections or wound dehiscences (8). More recently, a case-control study compared patients undergoing combined abdominoplasty and gynecological surgery with individuals undergoing abdominoplasty alone and gynecological surgery alone (9). The combined group experienced no increased complications and, actually, when compared with the sum of procedures when performed alone, there were significant reductions in operative times, estimated blood loss and total length of hospitalization.

The addition of abdominoplasty at the time of umbilical herniorrhaphy may theoretically increase the concern for wound complications. This possibility is of particular interest when mesh is involved.

Figure 3) Abdominal exposure with umbilicus and stay sutures, incised anterior rectus sheath and mesh placed in the preperitoneal plane. Note the right rectus abdominus muscle over mesh in superior, right fascial incision

Figure 4) Postoperative anterior view

The addition of mesh reinforcement of the anterior abdominal wall at the time of abdominoplasty has been advocated. A technique of a large mesh onlay covering the lower abdominal wall at the time of abdominoplasty has been described. The exposure during an abdominoplasty allows for the placement of a large synthetic mesh, which is secured to bilateral anterior superior iliac spines under tension along the inguinal ligaments and to the lateral muscle wall of the lower abdomen. The authors reported no recurrences and two seromas in 14 patients (10). The postgastric bypass population frequently presents with a ventral hernia and need for abdominoplasty following significant weight loss. The technique involves concomitant panniculectomy and mesh repair of incisional hernia once the patient reaches his or her maximum weight loss at 12 to 18 months following the bariatric procedure. Typically, the hernia repair involves an onlay of synthetic mesh after reinforcement or plication of the midline; the excess skin and soft tissue is then removed. In a series consisting of 50 patients (11), 40% developed seromas, of whom six required additional operative drainage or aspiration. Postoperative wound complications

were frequent and consisted of wound breakdown in 11 patients, cellulitis in five, subcutaneous abscess in four and draining sinus in three. There were no deep space or mesh infections. Harth et al (12) demonstrated a fivefold increased incidence of wound-related morbidity when panniculectomy was combined with a mesh-based hernia repair. The potential added wound morbidity of a panniculectomy must be considered when using a foreign body for hernia repair.

For ventral hernia repair, the preferred location for mesh placement – whether it is a synthetic or biological graft – is deep to or behind the fascial defect in a sublay manner. This repair is achieved with a preperitoneal, retrorectus or intra-abdominal placement of mesh (13). From a mechanical standpoint, mesh positioned posterior to the fascial defect takes advantage of Pascal's principle of hydrostatics by distributing the intra-abdominal forces over the surface area of the mesh. The retrorectus space or preperitoneal space is a well-vascularized domain where mesh can incorporate with reduced risk of infection (14). Avoidance of mesh placement in the intraperitoneal cavity is attractive to avoid the adhesive potential and possibility of future mesh-related complications (15). Development of the retrorectus space, however, risks damage to the umbilical perforators, particularly when combined with an abdominoplasty procedure. An onlay mesh repair would not be feasible in this case because a hole would have to be created in the centre of the mesh to accommodate the umbilical stalk. This approach would result

in a potential weak spot for a recurrence. We describe a technique for preservation of the umbilical stalk by developing the preperitoneal space on the side of the umbilicus. On the contralateral side, the retrorectus space is entered by dissecting the posterior rectus sheath. These two tissue planes are approximated in the midline to protect the visceral sac. The mesh is placed in the sublay position with transabdominal sutures while pulling the anterior fascia back toward the midline. This technical point avoids wrinkling of the mesh with closure of the anterior fascia and 'sets the tension' of the repair on the mesh and not the midline closure.

CONCLUSION

During concomitant abdominoplasty and umbilical hernia repair, a combined retrorectus and preperitoneal dissection allows for mesh-based repairs of umbilical defects for an adequate hernia repair and may help preserve some of the blood supply to the umbilicus.

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