Use of abdominoplasty technique and Marlex for closure of a major abdominal wall defect

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Surgical resection of extensive primary or secondary abdominal wall tumours leads to major defects requiring reconstruction. The present case report describes the use of Marlex (polypropylene) mesh (CR Bard Inc, USA) with Mitek GII suture anchors (Mitek Products, USA) and an abdominoplasty technique to close a defect involving the entire lower half of the abdominal wall.

Key Words: *Abdominal wall defect; Abdominal wall metastasis; Abdominoplasty; Cervical cancer; Marlex mesh; Mitek fixation*

Utilisation d'une technique d'abdominoplastie et de Marlex pour la fermeture d'un défaut majeur à la paroi abdominale

RÉSUMÉ : La résection chirurgicale de tumeurs volumineuses primaires ou secondaires de la paroi abdominale entraîne des anomalies majeures qui requièrent une reconstruction. Le présent rapport de cas décrit l'utilisation de marlex (polypropylène)(CR Bard Inc., É.-U.) avec des sutures Mitek GII (Mitek Products, É.-U.) et une technique d'abdominoplastie pour la fermeture d'une lésion touchant toute la moitié inférieure de la paroi abdominale.

Surgical resection of extensive primary or secondary abdominal wall tumours leads to major defects requiring reconstruction. The present case report describes the use of Marlex (polypropylene) mesh (CR Bard Inc, USA) with Mitek GII suture anchors (Mitek Products, USA) and an abdominoplasty technique to close a defect involving the entire lower half of the abdominal wall.

CASE PRESENTATION

As previously reported by Lane and Tay (1), a 58-year-old white, nonsmoking woman underwent a Wertheim's hysterectomy for poorly differentiated adenocarcinoma of the cervix (stage 1B), followed by adjuvant pelvic radiotherapy. Three years later, she developed a secondary mass in her left iliac fossa. Computed tomography scan showed invasion of the rectus sheath and fixation onto the pubic bone.

There were also several loops of small bowel that were adherent to the mass. Metastases to the liver and lungs were not detected.

The patient's condition was managed by radical resection of the secondary mass. The lower abdominal wall, including the umbilicus and half of the mons pubis, was excised en bloc with adherent loops of the bowel and inner table of the pubic bone. The small bowel ends were anastomosed. A 20 × 15 cm full-thickness, lower abdominal wall defect was reconstructed by using a Marlex mesh insert, fixed by 1-0 prolene sutured to the remaining fascia at the edge of the defect. Fixation of the Marlex mesh was augmented with fascial staples and Mitek GII suture anchors that were inserted into the pubic bone. An edge of Marlex mesh was left free over the external iliac vessels because they passed under the inguinal ligament. The remaining upper abdominal wall was then mo-

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bilized over the upper rectus sheath to the level of the subcostal margin. This abdominoplasty technique allowed enough laxity to advance the upper abdominal skin downward to achieve total closure.

The patient made an uneventful postoperative recovery, apart from localized cellulitis that responded rapidly to antibiotic treatment. She had no functional or aesthetic problems with the abdominal wall reconstruction, and during nine months of observation, there was no recurrent disease.

DISCUSSION

Abdominal wall secondary tumours from cervical primary tumours are rare (1,2). There are numerous methods for reconstructing abdominal wall defects. Marlex mesh for abdominal support has been well reported (3-5). For very large defects, regional flaps from the lateral trunk or lower limbs, or distant free flaps may be required for the provision of full-thickness skin cover. The use of tensor fascia lata flaps (6), oblique abdominal fasciocutaneous flaps (7), and latissimus dorsi (2) and rectus femoris myocutaneous flaps (8) has been described.

The ideal aims of reconstruction are to replace like with like and leave minimal donor site morbidity. The present case shows that it is possible to close major full-thickness defects involving the lower abdominal wall from the level of the umbilicus by using a combination of mesh and abdominoplasty technique.

Marlex fixation must be secure to provide reliable abdominal support. Mitek fixation is commonly used for ligamentous reconstruction in orthopedic surgery. These titanium anchors are swaged to strong nonabsorbable sutures and are drilled and buried into bone, providing secure fixation (9). This allows Marlex mesh stability for abdominal reconstruction involving bone.

Avoiding flap necrosis in full-thickness abdominal reconstruction is crucial. In general, thin, nonsmoking patients have less morbidity in abdominoplasty (10). For the abdominoplasty technique, it is best to avoid aggressive undermining of the upper abdominal flap preoperatively, and confining this, as described, to the area over the upper rectus

sheath. This helps to preserve skin vascularity and diminish postoperative seroma formation.

In cosmetic abdominoplasty, the umbilicus is preserved and relocated in the correct aesthetic position. In the present case there was no attempt at preservation to avoid further incisions in the upper abdominal flap. This helped to preserve vascularity of the abdominal flap advancement. Minimizing tension by nursing the patient with knees flexed postoperatively was important.

CONCLUSIONS

In summary, correct patient selection and the use of the appropriate reconstructive technique allow radical oncological abdominal wall surgery for palliation or cure. Ideally this should be achieved with good functional and aesthetic outcomes, and minimal donor site morbidity.

REFERENCES

1. Lane G, Tay J. Port-site metastasis following laparoscopic lymphadenectomy for adenosquamous carcinoma of the cervix. *Gynecol Oncol* 1999;74:130-3.
2. Neven P, Shepherd JH, Tham KF, Fisher C, Breach N. Reconstruction of the abdominal wall with a latissimus dorsi musculocutaneous flap: a case of a massive abdominal wall metastasis from a cervical cancer requiring palliative resection. *Gynecol Oncol* 1993;49:403-6.
3. Down NK, Falk RE, Makowka L. Excision of abdominal wall tumours and reconstruction with Marlex mesh. *Can J Surg* 1986;29:191-3.
4. Kambouris A. Full thickness abdominal wall resection for recurrent and metastatic neoplasms. A report of three cases. *Am Surg* 1988;54:356-60.
5. Weinstein LP, Kovachev D, Chaglassian T. Abdominal wall reconstruction. *Scand J Plast Reconstr Surg* 1986;20:109-13.
6. Williams JK, Carlson GW, Howell RL, Wagner JD, Nahai F, Coleman JJ. The tensor fascia lata free flap in abdominal-wall reconstruction. *J Reconstr Microsurg* 1997;13:83-90.
7. Iwahira Y, Maruyama Y, Shiba T. One-stage abdominal wall reconstruction with oblique abdominal fasciocutaneous flaps. *Ann Plast Surg* 1987;19:475-7.
8. Freedman AM, Gayle LB, Vaughan ED, Hoffman LA. One-stage repair of the anterior abdominal wall using bilateral rectus femoris myocutaneous flaps. *Ann Plast Surg* 1990;25:299-302.
9. Francis KR, Hoffman LA, Cornell C, Cortese A. The use of Mitek anchors to secure mesh in abdominal wall reconstruction. *Plast Reconstr Surg* 1994;93:419-21.
10. Grazer FM. Abdominoplasty. In: McCarthy JG, ed. *Plastic surgery*, 1st edn. London: WB Saunders, 1990:3929-63.