

Video case report

## Suspension of Panniculus Morbidus: Heavy Lifting Made Easy

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Plastic surgeons are often called on to perform an abdominal dermolipectomy or panniculectomy. Classically, this surgery has been indicated to facilitate other necessary procedures such as gynecologic operations, ventral hernia repairs, or bariatric surgery [1–3]. However, with more than one third of U.S. adults combating obesity, plastic surgeons are more frequently performing panniculectomies to treat the condition known as panniculus morbidus [4,5]. Although there is no standard mass that defines this condition, it is diagnosed when the pannus itself becomes a source of chronic infection, dermatitis, ulceration, sinus tract formation, or chronic lymphedema [6]. Panniculectomy has become increasingly covered by insurance as a result of the significant disability and morbidity associated with panniculus morbidus [7]. This will likely result in an increase in the number of panniculectomy procedures performed in the United States.

One of the major issues facing the plastic surgeon during panniculectomy is the preparation of the patient for surgery. Elevation and exposure of the pannus is often difficult, in particular in patients with panniculus morbidus. Panni can range in size, with some studies reporting weights up to 54 kg [6,8]. Suspension of these large skin segments is tenuous at best. Proper marking, sterilization and efficient excision require adequate suspension of the pannus during surgery.

Multiple papers have described various ways of suspending the pannus before panniculectomy. Richard (1965) described a method of suspension using a large bar suspended from IV poles with multiple sutures anchoring the pannus to the bar [9]. Meyerowitz et al. (1973) used Rush nails placed through the pannus to facilitate elevation using a system of pulleys [5]. A similar system of elevation has been described by Matory

et al. using Steinman pins instead of Rush nails suspended from the surgical lights [8]. Because of the large size and weight of the skin apron in panniculus morbidus, manual elevation is a challenge. Belin et al. (1966) used towel clips and a hydraulic lift to elevate the pannus. Safe and secure suspension of the skin apron in these large patients is necessary to ensure successful outcomes and the safety of the patient and staff. In this paper, a technique for a well-tolerated and effective suspension of the pannus during panniculectomy is presented along with a [supplemental video](#).

### Case Report

The pannus suspension technique was performed on a 35-year-old Hispanic male patient weighing 244 kg with a resected pannus weight of 94 kg ([Supplemental Video 1](#)). Before panniculectomy, computed tomography of the abdomen and pelvis is recommended to assess for the presence of a hernia; however, this is often not possible because of the patient's body habitus. Ultrasound of the pannus may be helpful in assessing for an undetected hernia in these patients. It should be noted that a negative ultrasound cannot completely exclude a hernia. General surgery should be notified before the procedure to be prepared to assist if the bowel becomes injured either during preparation of the pannus for suspension or during the surgery itself.

A hydraulic Ultralift 1500 (Tollos, Inc., Barrie, Ontario, Canada) is used for pannus suspension at our institution. Before using any hydraulic lift for pannus suspension, the manufacturer should be contacted to ensure that the lift can manage the weight of the pannus during the operation.

After the patient is under general anesthesia, place the patient supine with legs in the frog leg position. The pannus is then marked for placement of the 2 Steinman pins. An entry and exit mark should be made on the superior and inferior aspects of the most dependent portion of the pannus for each

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Fig. 1. The locking screws are checked before pannus elevation to ensure there is no slippage.

Steinman pin. The markings should be separated by a distance of approximately 8 inches. Make sure the distance does not exceed the width of the traction bow used for attachment to the lift, because this will make attachment of the bow to the pins more challenging. The left and right Steinman pins should be separated by at least 12 inches. This provides adequate support of the skin apron and maximal elevation throughout the case. Large diameter pins are used to help reduce pressure and prevent tearing of the skin apron overlying the pins.

Once the pin markings are placed, prepare the pannus for pin placement using sterile technique. A drill is used to place the Steinman pins through the preoperative markings, taking care to stay superficial in the skin apron to avoid any undetected herniated bowel. Once the pins are successfully through the pannus, the traction bow is placed on the superior end of the Steinman pin first and then the traction bow is placed around the ends of the Steinman pins to enable attachment to the hydraulic lift. To facilitate placement of the traction bow over the inferior end of the pin, the pin is drawn back close to the skin edge. Once the traction bow is placed over both ends of the pin, the pin is advanced so that the traction bow overlies the middle third of the pin. The locking screws of the traction bow are then securely attached to the Steinman pins (Fig. 1). The brakes of the hydraulic lift are engaged to slowly proceed with elevation of the pannus. The pins and the suspension apparatus should be watched carefully to ensure there is no slippage, instability, or skin tearing. Upon achievement of maximal elevation, the skin is prepped and draped in a sterile fashion for panniculectomy.

## Discussion

Panniculus morbidus is a debilitating condition for patients and warrants panniculectomy. Safe and effective elevation of the skin apron in panniculus morbidus resection is a must before surgery; however, the extreme weight of the skin apron makes suspension precarious. Proper suspension of the pannus allows

complete visualization of the surgical field, improves sterile preparation of the skin apron, helps reduce interstitial edema from the pannus, and facilitates safe resection and disposal. Multiple prior techniques have been described to elevate the pannus, as mentioned previously, but all leave room for improvement. Combining Steinman pins with a hydraulic lift, as our technique describes, gives physicians a well-tolerated and effective means of suspension. Given that a skin apron can be in excess of 45 kg in panniculus morbidus, using a hydraulic lift makes suspension significantly easier compared with manual suspension. In addition, the Steinman pins provide excellent support of large panni given their relatively large diameter and length. In combination with the traction bow, this creates a secure and strong apparatus for suspension of the pannus. Another benefit of this suspension technique is that the arm of the hydraulic lift can be moved during the procedure to adjust countertraction during dissection of the pannus. This mobility facilitates dissection of the inferior and superior dissection planes. Also, once the pannus has been resected, the lift can be mobilized to place the pannus in the proper receptacle for either disposal or pathology. This technique simplifies panniculectomy for the surgeon and the operating room staff.

## Disclosures

*The authors have no commercial associations that might be a conflict of interest in relation to this article.*

## Supplementary Data

Supplementary data associated with this article can be found in the online version at <http://dx.doi.org/10.1016/j.soard.2013.04.002>.

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