An improved method of exposure for transaxillary first rib resection

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Transaxillary first rib excision, used for thoracic outlet decompression, requires that the patient be in the lateral decubitus position with the arm elevated. This is traditionally accomplished by a junior resident or medical student holding the arm in the air for the duration of the case. This technical note presents a simplified method of passive arm elevation using orthopedic techniques that provides superb exposure of this area with no appreciable patient morbidity. (J Vasc Surg 2010;52:248-9.)

"No interns were harmed during the making of this report."

Transaxillary first rib excision, used for thoracic outlet decompression, requires that the patient be in the lateral decubitus position with the arm elevated, which is traditionally accomplished by a junior resident or medical student holding the arm in the air for the duration of the case. Our center has developed a simple method of passive arm elevation that provides superb exposure of this area with no appreciable patient morbidity.

TECHNIQUE

After induction of general anesthesia, the patient is placed in the full decubitus position on a beanbag with an axillary roll in place. The bottom leg is bent at the hip and knee, and the bottom arm is appropriately positioned and padded. The arm on the side of operation is held upright during positioning.

An overhead orthopedic "shower curtain holder" assembly (Mizuho OSI, Union City, Calif) is used for overhead suspension. This assembly is made from components used in setting up orthopedic traction and is widely available in all operating rooms; our orthopedic surgeons use this to hold a sterile "shower curtain" for hip surgery. As used in this fashion, the horizontal bar is too low, and we therefore adjust it to its highest level and bring the vertical uprights closer together for stability. This wheeled assembly is positioned just caudal to the patient's head, perpendicular to the long axis of the bed.

The arm is then wrapped using a shoulder suspension kit (Smith & Nephew, London, UK). This kit, used for orthopedic procedures, consists of an impervious plastic stockinette with a canvas loop at the top, Coban (3M, St. Paul, MN), and a cord and hook assembly. The arm is wrapped and elevated nonsterilely. The stockinette is applied to the elbow, and the Coban is used to wrap the entire arm from below the elbow to the hand. This diffuse wrap provides enough force to elevate the arm without any single area of pressure or skin damage. Finally, the nylon cord is

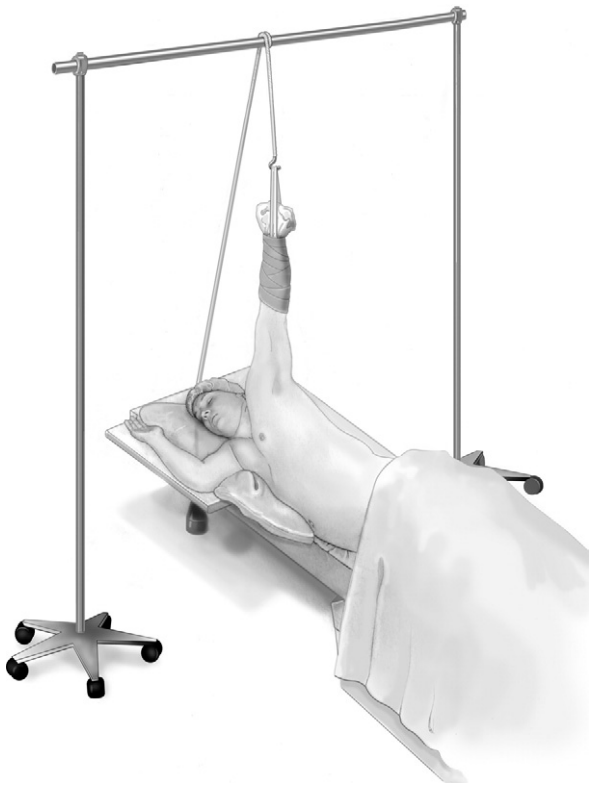

Fig 1. Illustration shows the completed assembly, setup, and exposure before preparation and sterile draping. Originally applied is the stockinette with canvas loop outermost, which is then used to suspend the arm overhead using the cord and metal fastener in the shoulder suspension kit (Smith & Nephew, London, UK). The Coban supplied is used to wrap the arm from the elbow to the hand, distributing the force over this entire area. Wrapping the cord 1.5 times around the horizontal rod empirically creates enough friction to keep the arm in place but allows manipulation up and down with one hand by the surgeon. Finally, the weight should be below the level of the head to eliminate the possibility of patient injury.

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Competition of interest: none.
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0741-5214/$36.00

doi:10.1016/j.jvs.2010.03.022

attached to the canvas loop, wrapped 1.5 times around the horizontal "shower curtain" bar, and attached to a 10- to 15-lb weight (depending on the patient's size), which should hang below the patient's head to avoid injury (Fig 1).

At this point, the patient's axillary region is then prepared for the operation. We drape out a limited field with towels and then place a Betadine-impregnated sticky drape, followed by a conventional laparotomy drape. The cephalad portion of the drape extends up the arm and is wrapped around the arm and the descending weighted cord and stapled so the surgeon can grasp the arm for adjustment within the sterile field. Any uncovered areas (usually the other arm) are then covered with additional drapes (Fig 2).

RESULTS

Since June 2003, we have used this technique in 43 transaxillary first rib resections for venous thoracic outlet syndrome. No patient has had any clinically apparent morbidity. Skin reddening is present for the first 10 minutes or so after the procedure, but no patient has had any skin injury. Staff morbidity, it should be noted, is 2.3% (1 of 43), resulting from the weight being dropped on the surgeon's toe.

DISCUSSION

This technique uses equipment that is readily available in most operating rooms, is very inexpensive, can be set up in <5 minutes, and has been associated with no adverse effects (stretch or skin damage) to the patient. Using the materials supplied with 1.5 loops around the bar hung by a 10- to 15-lb weight permits the surgeon to quite easily adjust the degree of shoulder stretch and axillary exposure with one arm, and the patient's arm will then stay exactly where it is positioned. Exposure can also be altered by sliding the "shower curtain holder" cephalad or caudally as needed. This setup routinely provides exposure to the junction of the jugular vein with the innominate, with no patient morbidity. Finally, the need for a staff member to hold the arm is eliminated, and the exposure provided is consistent, nonmoving, and very easily adjustable.

Fig 2. Photograph shows the completed setup after sterile preparation and draping. The axillary region is exposed using a pediatric laparotomy drape. We have found it most convenient to wrap the upper part of the drape around the two cords going up and down to allow the arm tension and elevation to be easily adjusted, but a conventional "ether-screen" setup can also be used.

Submitted Feb 6, 2010; accepted Mar 12, 2010.