Closing The Complex Open Abdomen: Rethinking The Management of Acute And Chronic Giant Ventral Hernias: The Cook County Experience

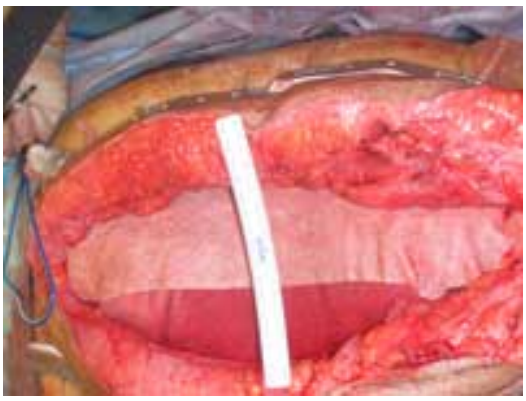
Andrew Dennis, DO, FACOS

Managing giant ventral hernias after traumatic injury and operation has become a dilemma plaguing trauma surgeons in recent years. The post-traumatic open abdomen presents either in the acute phase, days-to-weeks post-injury, or in the delayed chronic phase, years after the application of a skin graft directly over bowel or over an absorbable mesh. After years of struggling with this issue at Cook County Hospital, we instituted a new technique used to manage both acute and chronic giant ventral hernias.

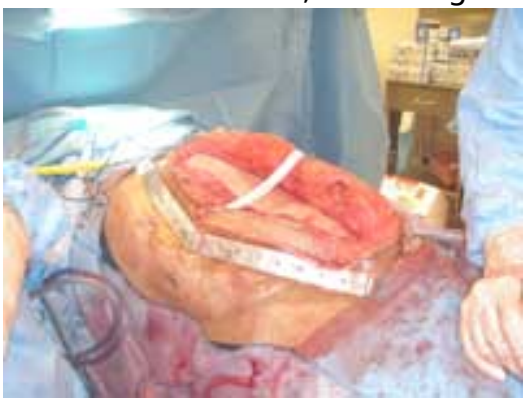
Since then, we have virtually eliminated the need for skin grafting the acutely open abdomen and have had significant success in bringing primary fascial closure to chronic giant ventral hernia patients without the use of components separation or bridging biological meshes.

We employ the Wittmann Patch (WP) as a component of what we term trans-abdominal wall traction. When initially described, the WP was sewn directly to the fascial edge which focused the medial traction forces on that area. When this technique is employed, there is often necrosis of the fascial edge, commonly forcing the resection of the 1 to 2 cm of precious fascia.

To avoid fascial necrosis and to enhance the physics of the medial traction offered by the WP concept, we modified the technique to place the WP into the abdomen as an underlay. We then suture the WP into place with a large, braided suture. The sutures course all layers of the abdominal wall at the lateral edge of the rectus muscle. We place pre-drilled 1"-wide padded aluminum bolsters cephalad to caudad over the skin of the anterior abdominal wall.

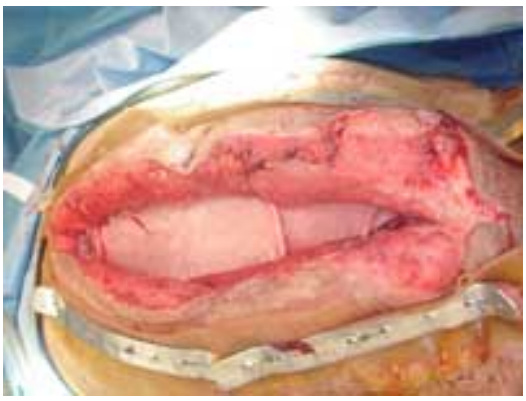


Prior to placing the bolsters, the skin is protected by a layer of hydrocolloid dressing. The sutures are placed through the bolsters and the knots tied on top. Adding the aluminum bolsters prevents skin breakdown and erosion of the suture through the skin. This construct changes the forces placed on the anterior abdominal wall by dispersing the medial traction forces throughout all the layers of the abdominal wall, including the skin.



No longer is the force isolated to the leading edge of the fascia, which is critical to successful primary closure. Instead, the abdominal wall is “sandwiched” between the WP and the bolsters, preserving the fascial blood supply and the leading fascial edge. Domain is re-captured by placing constant stretch on the oblique muscles.

Below the WP, we place a plastic barrier that covers the bowel and prevents adhesion formation between the viscera and the abdominal wall. Maintaining abdominal wall independence from the bowel is critical in order to successfully regain domain of the abdominal wall. We also use a negative pressure dressing over the WP. Most of our patients begin at 22 to 26 cm wide at the umbilicus (fascia to fascia). The average hernia length is greater than 30 cm. The initial application of trans-abdominal wall traction often reduces the defect by half. Our patients typically return to the OR every 48 to 72 hours for serial tightening of the trans-abdominal wall traction system.



The common successful recovery of domain is 2 to 3 cm per visit to the OR and our patients typically return to the OR an average of 4 to 5 times. We extubate between cases when possible and the patients can be managed in the ICU or on the general medical floor.

When the fascial edges are in close proximity, the system is removed, and the abdomen is closed primarily with interrupted absorbable suture and an underlay bio-prosthetic mesh is placed to reinforce the primary closure.