

TopClosure® of Large Abdominal Wall Defect Instead of Staged Hernia Repair as Part of Damage Control Laparotomy

MD, PhD Andriy Fedorenko

Pediatric Surgery Unit, Ziv Medical Center, Safed, Pediatric Surgery Department Rambam Health Care Campus, Haifa

MD Nave Lazar

Pediatric Surgery Unit, Ziv Medical Center, Safed, Pediatric Surgery Department Rambam Health Care Campus, Haifa

Abstract

Background: Early closure of the open abdomen is a priority after damage control laparotomy to prevent retraction of fascial layers and prevent hernia formation that requires definitive repair at a later stage. This substantially reduces the complications associated with ventral hernia formation for up to a year after initial surgery.

TopClosure® is an innovative method that employs stress-relaxation and mechanical creep for skin stretching. Its use enables the primary closure of large abdominal wall defects and mitigates large ventral hernia formation.

Materials and Methods: A 7-year-old girl presented with severe blast injury. She underwent initial laparotomy in a facility within the conflict zone and was transferred in a state of septic shock to our facility for further care. Her abdominal injuries included liver lacerations, multiple perforations of the transverse colon and ileum, and a 8x16cm oblique abdominal wall defect. Further damage control laparotomy was performed with primary suture of the colon and ileum and temporary closure of the abdomen using a Bagota bag. Twelve hours later negative pressure wound therapy (NPWT) was applied to the abdominal wound after relook laparotomy. Five days later TopClosure® was applied to the lower part of the wound incorporating NPWT to the upper wound.

Results: The patient suffered leak from the colonic suture line and required relaparotomy. TopClosure® abdominal closure was achieved after every laparotomy.

Conclusion: TopClosure® utilizes the viscoelastic properties of the skin achieving full closure of the abdominal wall (including the fascia and skin), eliminating the need for prolonged NPWT, skin graft, and delayed ventral hernia repair surgery.