

Open Ventral Hernia Repair with Component Separation

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KEYWORDS

- Ventral hernia • Incisional hernia • Abdominal wall reconstruction
- Retromuscular hernia repair • Transversus abdominis release (TAR)
- Rives-Stoppa technique

KEY POINTS

- Incisional hernias are the most common complication after laparotomy and the most common indication for reoperation after laparotomy.
- Recent advancements in mesh technology and technical refinements in the methods of herniorrhaphy have dramatically changed the way open hernia surgery is conducted.
- Abdominal wall reconstructive procedures, which typically include separation of the abdominal wall layers and release of one or more myofascial planes, require a clear understanding of the anatomy of the abdominal wall.
- The authors' favored approach to open ventral hernia repair is a posterior component separation (retrorectus dissection with release of the transversus abdominis aponeurosis and muscle) with sublay of appropriately selected mesh between layers of vascularized tissues and subsequent reconstruction of the linea alba.
- Retromuscular hernia repairs have been shown in multiple studies to have a low recurrence rate (3%–6%) at long-term follow-up and have been accepted as the gold standard technique for open ventral hernia repair by the American Hernia Society.

INTRODUCTION

Despite improved outcomes in many other areas of surgery, abdominal wall hernia formation still complicates 11% to 50% of all laparotomies.^{1–6} It remains the most common complication following laparotomy and is the most common indication for reoperation by a 3:1 margin over bowel obstruction.⁷ With more than 2 million laparotomies performed in the United States annually, general surgeons are faced with

Disclosures: Eric Pauli is a speaker for Bard and Synthes. Michael Rosen is a speaker for Covidien, Bard, and Lifecell. He receives research support from Lifecell, Davol, W.L. Gore, and Cook.

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Surg Clin N Am 93 (2013) 1111–1133

<http://dx.doi.org/10.1016/j.suc.2013.06.010>

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epidemic numbers of patients requiring ventral herniorrhaphy.⁸ A reliable method with a low recurrence rate is still clearly necessary for the estimated 200,000 patients undergoing ventral hernia repairs annually.⁹

Traditional methods of hernia repair have unacceptably high recurrence rates.^{10,11} Primary open suture repair of ventral hernias with simple fascial reapproximation results in recurrence rates in excess of 50% in long-term follow-up.^{6,12–19} Fifty-five years ago, the mesh herniorrhaphy was introduced.²⁰ The principle of a tension-free mesh reinforced herniorrhaphy has undergone technical refinements since this time and is still considered to be the gold standard repair.^{11,21} Despite the widespread implementation of this “gold standard,” the addition of mesh to open repairs still results in long-term recurrence rates as high as 32%.^{17–19} Moreover, the ideal method of mesh implantation is the subject of ongoing debate.

With the advent of laparoscopic ventral hernia repair in 1993, minimally invasive techniques became the preferential method for many surgeons.²² Intuitively, these repairs had the advantage: they provided wide mesh overlap of the hernia defect without significant soft tissue dissection. Short-term data suggested decreased morbidity and a lower recurrence rate.²³ Sadly, these data were not borne out in the long term, where recurrence rates in well-selected populations still reach 14% to 17%.^{24–27} As a consequence, one of the most pressing controversies of ventral hernia repair is whether to approach the problem in an open or laparoscopic fashion.¹¹

Parallel with the evolution of laparoscopic ventral hernia repair, novel methods of abdominal component separation were being developed. In 1990, Ramirez and colleagues²⁸ originally described techniques of medial fascial advancement to aid in definitive reconstruction. In their components separation, Ramirez and colleagues²⁸ first released the posterior rectus sheath. In 30% of their patients, this was insufficient to permit midline closure, and they therefore created large skin flaps to expose and release the external oblique muscle. Recurrence rates after such component separation hernia repairs range from 10% to 22%, with mean follow-up periods of 9.5 months to 4.5 years.^{29–31} Modifications of these myofascial advancement flaps have been developed to reduce the morbidity incurred by creating these skin flaps (and by default reduce the recurrence rate). Such methods include periumbilical perforator sparing (PUPS) methods, endoscopic release of the external oblique muscle, and, more recently, posterior component separation methods that avoid any skin undermining.^{32–38}

Posterior component separation methods are based on the Rives-Stoppa-Wantz retrorectus repair, which used the 6-cm-wide to 8-cm-wide potential space between the posterior rectus sheath and the rectus muscle to permit mesh positioning in a sublay fashion.^{39–42} Given its superior track record, this approach was deemed to be the gold standard method for open ventral hernia repair by the American Hernia Society in 2004.^{11,38} Although durable, the Rives-Stoppa-Wantz technique does not permit dissection beyond the lateral border of the posterior rectus sheath, making it insufficient to permit adequate mesh overlap and tension-free repair of larger abdominal wall defects.^{38,42} Methods to extend this potential space have been described and include preperitoneal dissection, intramuscular plane formation, and release of the transversus abdominis muscle.^{35,37,38,43} Using these methods, surgeons have been able to achieve recurrence rates as low as 3% to 6%.^{35,36,38,43}

In this article, we describe our current operative technique for open ventral hernia repair using component separation. Although we describe methods of anterior component separation, in our current practice, we primarily use posterior component separation with transversus abdominis release to permit dissection beyond the retrorectus space. This method adheres to the literature supported principles of a

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