Minimally invasive repair of a lumbar hernia utilizing the subcutaneous space only

Jessica S. Clothier^a, Marc A. Ward, MD^{a,b,c} , Ahmed Ebrahim^a , and Steven G. Leeds, MD^{a,b,c}

^aCollege of Medicine, Texas A&M Health Sciences Center, Dallas, Texas; ^bCenter for Advanced Surgery, Baylor Scott & White Health, Dallas, Texas; ^cDepartment of Minimally Invasive Surgery, Baylor University Medical Center, Dallas, Texas

ABSTRACT

Lumbar hernias are from weakened areas in the posterior lateral abdominal wall. Minimally invasive techniques are recommended for nonmidline abdominal wall hernias. Endoscopic methods utilizing the subcutaneous space only are rarely reported. A 66-year-old man presented with abdominal pain and a computed tomography (CT) scan revealing a lumbar hernia. The procedure was done utilizing the subcutaneous space to open the hernia sac and repair the defect in layers. A sublay mesh and an onlay mesh were used within the subcutaneous pocket. The patient had an uneventful postoperative course and was discharged home. A subsequent CT scan showed that the completed repair remained intact. Few endoscopic lumbar hernia repairs are reported despite the advantageous aspects of the procedure in avoiding the peritoneal cavity and the retroperitoneum.

KEYWORDS Endoscopic hernia repair; endoscopic surgery; hernia repair with mesh; lumbar hernia; minimally invasive surgery; ventral hernia

Approximately 25% of the population will develop a ventral hernia in their lifetime. Hernia repair is one of the most common procedures for a general surgeon and costs billions of dollars to the health care system.¹ In particular, lumbar hernias commonly present as a palpable flank mass that increases in size with strenuous activity and/or intra-abdominal pressure.² These hernias protrude through weakened areas in the posterior-lateral abdominal wall at the superior or inferior lumbar triangles, resulting in Grynfeltt or Petit hernias, respectively.³ Studies favor the use of minimally invasive techniques such as laparoscopy for nonmidline ventral hernias over open procedures^{4,5}; however, the application of a purely subcutaneous approach for lumbar hernia that completely bypasses the peritoneal or retroperitoneal space is seldom reported. Here we look at a case of endoscopic lumbar hernia repair.

CASE PRESENTATION

A 66-year-old man with known coronary artery disease, diverticulitis, multiple back surgeries, and a body mass index of 36 kg/m² was referred for evaluation of a newly discovered posterolateral bulge. His chief complaint was severe bilateral abdominal pain for the last 2 years, which he described as sharp and constant. A computed tomography (CT) scan

showed a 2.8-cm posterior right abdominal wall defect with a hernia sac containing retroperitoneal adipose tissue measuring 6 × 3 × 5 cm (*Figure 1a*). Surgery was scheduled for an endoscopic lumbar hernia repair without the need to enter the peritoneal cavity or retroperitoneum.

Prior to the operation, the location of the patient's hernia was marked. This allowed the specific location of the hernia to be identifiable once the patient was in the prone position. The patient underwent general endotracheal anesthesia and was placed in the prone position (*Figure 1b*). An incision was made in the skin approximately 8 to 10 cm superior to the marked lumbar area on the right side, and the subcutaneous tissue was bluntly dissected to the fascia overlying the ribs. Further blunt dissection was used to start the subcutaneous pocket, taking care not to make the skin incision too large. A trocar was placed into this incision and insufflation was started. The small pocket was visualized, and under direct visualization another trocar was placed through the skin and into the subcutaneous space. Ultrasonic shears were used to tunnel down to the fascia and follow it to the marked skin location of the hernia, facilitating the enlargement of the subcutaneous pocket. A third trocar was placed. The subcutaneous pocket extended over the lumbar hernia area down to the iliac crest and posterior midline (*Figure 1c*). The hernia sac

Corresponding author: Steven G. Leeds, MD, Center for Advanced Surgery, Baylor Scott & White Health, 3500 Gaston Ave., Dallas, TX 75246 (e-mail: Steven.Leeds@BSWHHealth.org)

Color versions of one or more of the figures in the article can be found online at www.tandfonline.com/ubmc.

Received June 4, 2019; Revised July 30, 2019; Accepted July 31, 2019.

Figure 1. (a) CT scan showing the right-sided flank hernia. (b) Prone position in the operating room. (c) View of the subcutaneous pocket and trocar placement. (d) Closure of the fascia with barbed suture. (e) Mesh placed in the subcutaneous pocket. (f) Interval follow-up CT scan showing continued resolution of the hernia.

was identified and opened to expose its contents and the defect in the fascia. The hernia sac was excised and a 1 polydioxanone barbed suture was used to close the defect primarily in layers. The fascia surrounding the internal oblique muscle was approximated first and reinforced with a sublay mesh. A medium-weight, low-density polypropylene mesh was cut to fit the defect and laid on top of the approximated fascia. Next, the fascia surrounding the external oblique muscle was closed with the same suture encasing the mesh (*Figure 1d*).

In addition to the sublay mesh, an onlay mesh placement was used. The second onlay mesh was used because it was able to be fixed to the fascia with sutures where the sublay mesh was held in place only by the surrounding tissue. It was not safe to place transfascial sutures through the internal oblique aponeurosis with the retroperitoneum directly adjacent. This mesh was laid over the repair in the subcutaneous pocket and secured to the fascia with interrupted 2-0 Prolene sutures (*Figure 1e*). A Jackson Pratt drain was placed as the insufflation was released, and all incisions were closed and covered with adhesive glue.

The patient was admitted due to his medical comorbidities and for pain control. His postoperative course was uneventful and he was discharged on the first postoperative day. The patient was in the emergency room several weeks later for a nonrelated ailment that resulted in a CT scan of his abdomen and pelvis. This revealed an intact repair (*Figure 1f*).

DISCUSSION

To date, no prospective or retrospective study has evaluated the use of endoscopic lumbar hernia repair, and only a

few successful case reports have been published. These cases highlight the advantages of a less-invasive option to decrease the risk for postoperative complications by avoiding the peritoneal and retroperitoneal spaces as well as the potential for faster recovery times. The technique shows promise and is less invasive than a laparoscopic or open approach, while achieving the same outcome. Larger studies need to be performed to focus on technique and study long-term outcomes.

ORCID

Marc A. Ward <http://orcid.org/0000-0002-7147-3994>

Ahmed Ebrahim <http://orcid.org/0000-0002-1076-4835>

Steven G. Leeds <http://orcid.org/0000-0002-7045-8864>

1. Khorgami Z, Hui BY, Mushtaq N, et al. Predictors of mortality after elective ventral hernia repair: an analysis of national inpatient sample. *Hernia*. 2018. doi:10.1007/s10029-018-1841-x.
2. Bosanquet DC, Ansell J, Abdelrahman T, et al. Systematic review and meta-regression of factors affecting midline incisional hernia rates: analysis of 14,618 patients. *PLoS One*. 2015;10:e0138745. doi:10.1371/journal.pone.0138745.
3. Beffa LR, Margiotta AL, Carbonell AM. Flank and lumbar hernia repair. *Surg Clin North Am*. 2018;98:593–605. doi:10.1016/j.suc.2018.01.009.
4. Suarez S, Hernandez JD. Laparoscopic repair of a lumbar hernia: report of a case and extensive review of the literature. *Surg Endosc*. 2013;27:3421–3429. doi:10.1007/s00464-013-2884-9.
5. Lal R, Sharma D, Hazrah P, et al. Laparoscopic management of non-midline ventral hernia. *J Laparoendosc Adv Surg Tech A*. 2014;24:445–450. doi:10.1089/lap.2013.0381.