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Review Article

Bilateral Inguinal Hernia in Adults: An Update on Management: Narrative Review Article

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Abstract: Bilateral inguinal hernia represents a significant subset of groin hernias, accounting for approximately 8-30% of all inguinal hernia presentations. The management of bilateral inguinal hernia has evolved substantially over the last three decades, with minimally invasive approaches increasingly becoming the preferred treatment modality. The introduction of laparoscopic techniques has transformed surgical practice by reducing postoperative pain, facilitating earlier recovery, and enabling simultaneous repair of both groins through a single operative approach. Current international guidelines recommend mesh-based repair as the standard treatment for most adult patients, while laparo-endoscopic techniques, including transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) approaches, are particularly advantageous in bilateral disease. The choice between open and laparoscopic repair depends on patient factors, surgeon expertise, resource availability, and hernia characteristics. This review examines the contemporary management strategies for bilateral inguinal hernia. Emphasis is placed on the laparoscopic and open techniques that are used for bilateral inguinal hernia management. Current literature demonstrates that minimally invasive mesh repair offers superior short-term outcomes and comparable recurrence rates when compared with open techniques in appropriately selected patients.

Keywords: "Bilateral"," Inguinal Hernia", "Lichtenstein", "TAPP"," TEP"," Preperitoneal", "Open Repair", and "Complications".

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INTRODUCTION

Inguinal hernia is a common clinical condition that is encountered predominantly in adult males, and it has the highest prevalence of 4.2% in those who are above the age of 75. Some of the risk factors for inguinal hernia include male sex, increasing age, and genetic predisposition (McBee *et al.*, 2022). Surgical treatment of inguinal hernia in adults includes open procedures such as the Lichtenstein repair, which is the most common mesh-based open inguinal repair. Laparoscopic inguinal hernia repairs include the Transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) repairs (Bittner & Schwarz, 2012). The Transabdominal Preperitoneal (TAPP) and Total Extraperitoneal (TEP) repairs are used for the surgical management of bilateral inguinal hernia in adults due to the advantage of performing the repair through the same incision and the reduced postoperative complications and analgesic use. However, these repairs will require training and expertise, and this may limit their use in certain regions(Doudakmanis *et al.*, 2022; Köckerling & Schug-Pass, 2014).

The HerniaSurge guidelines for the management of inguinal hernia have recommended laparoscopic repairs (Transabdominal preperitoneal and total extraperitoneal) for the management of bilateral inguinal hernia in adults if the expertise and equipment are available(Tran, 2018). The European Hernia Society guidelines on the treatment of inguinal hernia in adults have recommended the mesh-based open or laparoscopic inguinal hernia repairs (Transabdominal preperitoneal and total extraperitoneal) for bilateral inguinal hernia(Simons *et al.*, 2009). The European Association of Emergency Surgeons (EAES), in their consensus on endoscopic repair of groin hernias, has also recommended the transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) for bilateral inguinal hernia repair, with no preference being given for either procedure(Poelman *et al.*, 2013).

The treatment of bilateral inguinal is predominantly performed by laparoscopic inguinal hernia repairs, which include the transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP). We conducted this review article to investigate the open and laparoscopic repairs for bilateral inguinal hernias, looking at the advantages and disadvantages of these procedures. We conducted a literature review using PUBMED, Cochrane Database of Clinical Reviews, and Google Scholar, looking for clinical trials, observational studies, cohort studies, systematic reviews, and meta-analyses from 1990 to 2026. We used the following keywords: “bilateral”, “inguinal hernia”, “Lichtenstein”, “TAPP”, “TEP “,” preperitoneal repair “,” open repairs”, and “complications”. All articles were in English only. Further articles were obtained by manually cross-referencing the literature. Case reports and studies with fewer than 10 patients and editorials were excluded. Adult male and female patients were included in this study, and pediatric patients were excluded.

DISCUSSION

Laparoscopic Hernia Repair for Bilateral Inguinal Hernia in Adults

A retrospective study on the trends and predictors of laparoscopic bilateral inguinal hernia repair was conducted by Hidalgo *et al*., A total of 21,795 cases of bilateral inguinal hernia were operated on over 3 years, with 84% undergoing the open approach and 16% undergoing the laparoscopic approach. There has been a steady increase in the laparoscopic repair from 12% to 23%(Hidalgo, Guillaumes, Bachero, Holguín, *et al*., 2023). Kockerling *et al*., performed a retrospective analysis of 9395 patients with bilateral and unilateral total extraperitoneal hernia repair (TEP). 6700 patients underwent unilateral repair, and 2695 patients underwent bilateral repair. There were no differences regarding postoperative complications, but bilateral TEP repair was associated with a higher rate of urinary bladder injury (0.28% vs 0.04%) and a higher reoperation rate (1.78%vs 0.82%)(Köckerling *et al*., 2015).

Schmedt *et al*., retrospectively assessed transabdominal preperitoneal (TAPP) repair for bilateral inguinal hernia repair. There were 5524 patients, with 4188 undergoing unilateral TAPP and 1336 undergoing bilateral inguinal hernia repair. The procedures showed no differences in morbidity (3.2% vs 5%) or reoperation rates (0.6% vs 1.4%). There were no differences regarding the recurrence rates (0.9% vs 0.6%) between the procedures(Schmedt *et al*., 2002). Wauschkuhn *et al.,* conducted a retrospective study on laparoscopic inguinal hernia repair for bilateral inguinal hernia repair. 2880 patients with bilateral inguinal hernia underwent the transabdominal preperitoneal (TAPP) repair, and there were no differences regarding postoperative complications, conversion to open, and recurrence when compared to unilateral TAPP repair(Wauschkuhn *et al*., 2010).

Gass *et al*., analyzed prospective data on total extraperitoneal (TEP) for bilateral inguinal hernia. There were 6505 patients in this study, with 3408 undergoing bilateral TEP and 3457 undergoing unilateral TEP. Bilateral TEP was associated with slightly higher postoperative complications (3.2% vs 2.3%), but there were no differences regarding length of hospital stay and conversion to open repair(Gass *et al*., 2012). A prospective randomized controlled trial comparing lightweight versus heavyweight mesh in chronic pain incidence following TEP repair for bilateral inguinal hernia was conducted by Chui *et al*., there was a total of 100 bilateral TEP repairs performed, with 50 using heavyweight mesh and 50 using lightweight mesh. Foreign body sensation was noted in more patients who had used heavyweight mesh compared to lightweight mesh (24% vs 8%). There were no recurrences between both types of mesh. Lightweight mesh may be preferable due to the reduced incidence of foreign body sensation(Chui *et al*., 2010).

Knook *et al*., conducted a retrospective study on the total extraperitoneal (TEP) repair for bilateral inguinal hernia. There were 98 patients in this study, and postoperative complications were seen in 10% of the cases, and recurrence was noted in 7 patients(Knook *et al*.,1999.).Ohana *et al*., performed a randomized study on repair of bilateral inguinal hernia with the total extraperitoneal repair, comparing single vs double mesh. There were 65 patients, with 32 undergoing single mesh and 33 undergoing double repairs. There were no differences regarding postoperative complications and recurrence between the procedures. This study concluded that a single large mesh is effective for laparoscopic inguinal hernia repair(Ohana *et al*., 2006).

Jacob *et al*., looked at the outcomes of unilateral versus bilateral inguinal hernia repair using the transabdominal preperitoneal (TAPP) technique by analyzing the Herniamed registry. There were 15,176 patients, with 10,887 undergoing unilateral TAPP and 4289 undergoing bilateral TAPP. The rate of postoperative complications (4.9% vs3.9%) and reoperation rate (1.9%vs 0.9%) were higher in the bilateral TAPP group(Jacob *et al*., 2015). Kald *et al*., conducted a randomized prospective study on laparoscopic hernia repair for bilateral inguinal hernia. There were 484 patients in this study, with 380 undergoing unilateral hernia repairs and 64 undergoing bilateral hernia repairs. There were no differences regarding postoperative complications and recurrence between the procedures(Kald *et al.*,2000).A prospective randomized trial comparing laparoscopic transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) repairs for bilateral inguinal hernia was conducted by Sharma *et al*., 66 patients were randomized to 33 who underwent the TAPP repair and 33 who underwent the TEP repair. The mean operative time was shorter in the TAPP group, and subcutaneous emphysema was noted in the TEP group. There were no

differences regarding length of hospital stay and time to return to work(Sharma *et al*., 2015).

A systematic review and meta-analysis comparing laparoscopic total extraperitoneal (TEP) versus Transabdominal preperitoneal (TAPP) for bilateral inguinal hernia was conducted by Carniero *et al*., There were 11 studies with 1714 patients, with 910 undergoing TEP and 804 undergoing TAPP. There were no differences regarding postoperative complications, hematoma formation, or chronic pain between the procedures. The conversion to open repair was 2.92% in the TEP repair and 0% for the TAPP(Alexander Olivera Carniero & W.Rodrigo Calmet Rocca, 2026). A systematic review and meta-analysis comparing laparoscopic total extraperitoneal (TEP) versus Transabdominal preperitoneal (TAPP) repairs in bilateral inguinal hernia was conducted by Tzeng *et al*., There were 7 studies with 1164 patients included in this review, and there were no differences regarding postoperative pain between the procedures (SMA-4.60,95%CI,53.77-44.56), and the recurrence was lower in the TAPP group (OR-0.27,95%CI,0.11-0.67)(Tzeng *et al*., 2026). A systematic review and meta-analysis of laparoscopic transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) repair for bilateral inguinal hernia was conducted by Pan *et al*., There were 9 studies with 1319 patients in this review, with 846 undergoing TAPP and 473 undergoing TEP, and there were no differences regarding postoperative complications, length of hospital stay, and recurrence rates between the procedures. This study concluded that both TAPP and TEP were effective for the treatment of bilateral inguinal hernia(Pan *et al*., 2026).

Hidalgo *et al*., conducted a retrospective cohort study comparing the total extraperitoneal (TEP) and Transabdominal preperitoneal (TAPP) repairs for bilateral inguinal hernia. There were 155 patients in this study, with 71 patients undergoing TEP and 84 patients undergoing TAPP. There were no differences regarding postoperative complications, chronic pain, and recurrence between the procedures. The TAPP procedure was associated with a shorter operative time, but the TEP repair was associated with a higher conversion rate (8.5% vs 0%)(Hidalgo, Guillaumes, Bachero, Butori, *et al*., 2023). A systematic review and meta-analysis comparing unilateral and bilateral total extraperitoneal (TEP) inguinal hernia repair was conducted by Hitman *et al*., There were 8 studies with 18,153 patients in this review, and bilateral TEP was associated with an increased operative time (MD: 17.59 min, 95% CI: 11.08- 24.87), but no differences regarding postoperative hematoma, urinary retention, and length of hospital stay between the procedures. Bilateral TEP repair was associated with a higher recurrence rate when compared to unilateral TEP(Hitman *et al.,* 2023).

Table I

Study	Study Type	N=numbers	Postoperative complications	Recurrence rates
Hidalgo *et al*., 2023	Retrospective cohort study	155	No difference between TAPP & TEP	No difference between TAPP & TEP
Olivera Carneiro *et al.*, 2026	Systematic review & Meta-analysis	1714	No difference between the procedures	No difference between the procedures
Tzeng *et al*., 2026	Systematic review & Meta-analysis	1164	No differences between the procedures (SMA-4.60	No differences between the procedures (OR-0.27

Table showing the differences between the TAPP and TEP repairs in Bilateral inguinal hernia regarding complications and recurrence

Comparison between the Laparoscopic and Open Inguinal Hernia Repairs for Bilateral Inguinal Hernia

Feliu *et al.,* conducted a prospective non-randomized study comparing the laparoscopic and open approach for bilateral inguinal hernia repair. There were 128 patients in this study, with 53 patients undergoing open inguinal hernia repair and 75 patients undergoing laparoscopic inguinal hernia repair. There were more complications in the open procedure when compared to the laparoscopic procedure (3.8% vs1.3%), but there were no differences regarding recurrence between the procedures (3.8% vs 1.6%). The laparoscopic repair was associated with a shorter operative time when compared to the open repair(Feliu *et al*., 2011). Agarwal *et al*., compared the open and laparoscopic repair techniques for bilateral inguinal hernia. There were 1927 patients in this study, with 1690 undergoing laparoscopic repairs and 237 undergoing open repairs. There were no differences regarding postoperative complications and recurrence rates between the procedures(Agarwal *et al*., 2025).

A prospective randomized trial comparing the transabdominal preperitoneal (TAPP) vs open mesh repair for bilateral and recurrent inguinal hernia was conducted by Mahon *et al*., the study included 120 patients: 60 underwent TAPP repairs (bilateral: 41; recurrent: 19), and 60 underwent open mesh repairs. Laparoscopic repair was associated with reduced postoperative pain and a faster return to work compared with open repair (Mahon *et al*., 2003). A prospective randomized study comparing laparoscopic transabdominal preperitoneal (TAPP) versus Lichtenstein repair for bilateral inguinal hernia was conducted by Lelpo *et al*., There were 134 patients, with

61 undergoing TAPP repair and 73 undergoing open repairs. The TAPP repair was associated with reduced postoperative complications, chronic pain, and shorter length of hospital stay(Lelpo *et al*., 2018).

Gomez-Jurado *et al*., conducted a retrospective study comparing the open preperitoneal repair with laparoscopic inguinal hernia repair for bilateral inguinal hernia. There were 182 patients in this study, with 116 undergoing open preperitoneal repairs and 66 undergoing laparoscopic repairs. The open preperitoneal repair was associated with a shorter operative time, but there were no differences regarding the recurrence rate and surgical site infections between the procedures(Gomez-Jurado *et al*., 2026). Yosypenko *et al*., performed a prospective study comparing the laparoscopic total extraperitoneal (TEP) versus the open Lichtenstein repair for bilateral inguinal hernia. There were 93 patients in this study, with 43 undergoing the TEP repair and 48 undergoing the Lichtenstein repair. The patients who underwent the TEP repair were associated with reduced early postoperative pain and a faster return to work, but there were no differences regarding overall postoperative complications(Yosypenko *et al*., 2025).

CONCLUSION

Bilateral inguinal hernia is a common surgical condition that requires individualized, evidence-based management. Surgical repair remains the definitive treatment for symptomatic patients. Mesh-based repair is the standard of care because it provides durable reinforcement and low recurrence rates. Current international guidelines favor laparo-endoscopic techniques, particularly TEP and TAPP repairs, for primary bilateral inguinal hernias owing to reduced postoperative pain, faster recovery, and the ability to treat both groins through the same operative field. Optimal outcomes depend upon appropriate patient selection, surgeon expertise, adherence to guideline-based practice, and careful management of postoperative pain and recurrence risk. Continued advances in minimally invasive surgery and biomaterials are likely to further improve patient outcomes in the coming decades.

Conflict of Interest: There is no conflict of interest.

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