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Chapter 1

Bilateral Inguinal Hernia in Adults: A Review

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Abstract

Bilateral inguinal hernia constitutes a notable proportion of groin hernias, comprising approximately 8-30% of all inguinal hernia cases. Over the past three decades, the management of bilateral inguinal hernia has undergone significant advancements, with minimally invasive techniques increasingly favored as the treatment of choice. The advent of laparoscopic methods has revolutionized surgical practice by diminishing postoperative pain, promoting earlier recovery, and allowing for the simultaneous repair of both groins through a single surgical procedure. Current international guidelines advocate for mesh-based repair as the standard treatment for most adult patients, with laparo-endoscopic techniques, such as transabdominal preperitoneal (TAPP) and totally extraperitoneal (TEP) approaches, offering particular benefits in cases of bilateral disease. The decision between open and laparoscopic repair is influenced by patient-specific factors, surgeon expertise, resource availability, and the characteristics of the hernia. This chapter explores contemporary management strategies for bilateral inguinal hernia, with a focus on the laparoscopic and open techniques employed in its management. Current literature indicates that minimally invasive mesh repair provides superior short-term outcomes and comparable recurrence rates to open techniques in appropriately selected patients.

Keywords: Bilateral,Inguinal hernia, Lichtenstein, TAPP, TEP, Preperitoneal, Open repair, and Complications.

Introduction

Inguinal hernia is a prevalent clinical condition, primarily observed in adult males, with a peak prevalence of 4.2% in individuals over the age of 75. Risk factors for inguinal hernia include male sex, advancing age, and genetic predisposition (McBee et al., 2022). Surgical interventions for inguinal hernia in adults encompass open procedures, such as the Lichtenstein repair, which is the most frequently employed mesh-based open inguinal repair. Laparoscopic techniques for inguinal hernia repair include the Transabdominal Preperitoneal (TAPP) and Total Extraperitoneal (TEP) approaches (Bittner & Schwarz, 2012). These laparoscopic methods are particularly advantageous for the surgical management of bilateral inguinal hernia in adults, as they allow for repair through a single incision and result in reduced postoperative complications and analgesic requirements. Nonetheless, the implementation of TAPP and TEP repairs necessitates specialized training and expertise, which may restrict their availability in certain regions (Doudakmanis et al., 2022; Köckerling & Schug-Pass, 2014).

The HerniaSurge guidelines advocate for laparoscopic repairs, specifically Transabdominal Preperitoneal (TAPP) and Total Extraperitoneal (TEP) approaches, in the management of bilateral inguinal hernia in adults, contingent upon the availability of expertise and equipment (Tran, 2018). Similarly, the European Hernia Society guidelines endorse mesh-based open or laparoscopic repairs, including TAPP and TEP, for bilateral inguinal hernia (Simons et al., 2009). Furthermore, the European Association of Endoscopic Surgeons (EAES) consensus on endoscopic groin hernia repair also recommends TAPP and TEP for bilateral inguinal hernia repair, without expressing a preference for either procedure (Poelman et al., 2013).

Laparoscopic inguinal hernia repairs, specifically the transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) techniques, are predominantly employed in the treatment of bilateral inguinal hernias. This chapter examines both open and laparoscopic repair methods for bilateral inguinal hernias, evaluating their respective advantages and disadvantages. A comprehensive literature review was conducted

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using PUBMED, the Cochrane Database of Clinical Reviews, and Google Scholar, focusing on clinical trials, observational studies, cohort studies, systematic reviews, and meta-analyses published between 1990 and 2026. The search utilized keywords such as “bilateral,” “inguinal hernia,” “Lichtenstein,” “TAPP,” “TEP,” “preperitoneal repair,” “open repairs,” and “complications.” Only articles published in English were considered. Additional relevant articles were identified through manual cross-referencing of the literature. Exclusion criteria included case reports, studies with fewer than 10 patients, and editorials. The study population comprised adult male and female patients, with pediatric patients being excluded.

Discussion

Laparoscopic hernia repair for bilateral inguinal hernia in adults

Hidalgo et al. conducted a retrospective study examining the trends and predictors of laparoscopic bilateral inguinal hernia repair. Over a period of three years, 21,795 cases of bilateral inguinal hernia were operated on, with 84% of these cases utilizing the open approach and 16% employing the laparoscopic approach. The study observed a consistent increase in the use of laparoscopic repair, rising from 12% to 23% (Hidalgo et al., 2023). In a separate retrospective analysis by Kockerling et al., 9,395 patients underwent total extraperitoneal hernia repair (TEP), with 6,700 patients receiving unilateral repair and 2,695 undergoing bilateral repair. The analysis found no differences in postoperative complications; however, bilateral TEP repair was associated with a higher incidence of urinary bladder injury (0.28% compared to 0.04%) and a higher reoperation rate (1.78% compared to 0.82%) (Doudakmanis et al., 2022; Köckerling & Schug-Pass, 2014).

Schmedt et al. conducted a retrospective evaluation of transabdominal preperitoneal (TAPP) repair for bilateral inguinal hernia. The study included 5524 patients, with 4188 undergoing unilateral TAPP and 1336 undergoing bilateral repair. The analysis revealed no significant differences in morbidity (3.2% vs. 5%) or reoperation rates (0.6% vs. 1.4%). Additionally, recurrence rates were comparable between the procedures (0.9% vs. 0.6%) (Schmedt et al., 2002). Similarly, Wauschkuhn et al. performed a retrospective study on laparoscopic inguinal hernia repair for bilateral cases. Among 2880 patients who underwent TAPP repair for bilateral inguinal hernia, no differences were observed in postoperative complications, conversion to open surgery, or recurrence when compared to unilateral TAPP repair (Wauschkuhn et al., 2010).

Gass et al. conducted an analysis of prospective data concerning total extraperitoneal (TEP) procedures for bilateral inguinal hernia. The study encompassed 6505 patients, with 3408 undergoing bilateral TEP and 3457 undergoing unilateral TEP. The findings indicated that bilateral TEP was associated with a marginally higher rate of postoperative complications (3.2% compared to 2.3%); however, no differences were observed in terms of hospital stay duration or conversion to open repair (Gass et al., 2012). Chui et al. conducted a prospective randomized controlled trial to compare the incidence of chronic pain following TEP repair for bilateral inguinal hernia using lightweight versus heavyweight mesh. The trial involved 100 bilateral TEP repairs, with 50 utilizing heavyweight mesh and 50 utilizing lightweight mesh. A greater incidence of foreign body sensation was reported among patients with heavyweight mesh compared to those with lightweight mesh (24% versus 8%). No recurrences were observed with either type of mesh. The use of lightweight mesh may be advantageous due to the lower incidence of foreign body sensation (Chui et al., 2010).

Knook et al. conducted a retrospective study examining the total extraperitoneal (TEP) repair for bilateral inguinal hernia. The study included 98 patients, with postoperative complications occurring in 10% of cases and recurrence observed in 7 patients (Knook et al.,1999). In a separate investigation, Ohana et al. performed a randomized study comparing single versus double mesh in the repair of bilateral inguinal hernia using the total extraperitoneal approach. This study involved 65 patients, with 32 receiving single mesh and 33 receiving double mesh repairs. The findings indicated no significant differences in postoperative complications and recurrence between the two procedures. The study concluded that a single large mesh is effective for laparoscopic inguinal hernia repair (Ohana et al., 2006).

Jacob et al. examined the outcomes of unilateral versus bilateral inguinal hernia repair using the transabdominal preperitoneal (TAPP) technique by analyzing data from the Herniamed registry. The study included 15,176 patients, with 10,887 undergoing unilateral TAPP and 4,289 undergoing bilateral TAPP. The bilateral TAPP group exhibited higher rates of postoperative complications (4.9% vs. 3.9%) and reoperation (1.9% vs. 0.9%) compared to the unilateral group (Jacob et al., 2015). Kald et al. conducted a randomized prospective study on laparoscopic hernia repair for bilateral inguinal hernia, involving 484 patients, with 380 undergoing unilateral repairs and 64 undergoing bilateral repairs. The study found no differences in postoperative complications and recurrence between the procedures (Kald et al., n.d.). Sharma et al. conducted a prospective randomized trial comparing laparoscopic transabdominal preperitoneal (TAPP) and total extraperitoneal (TEP) repairs for bilateral inguinal hernia. Sixty-six patients were randomized, with 33 undergoing TAPP repair and 33 undergoing TEP repair. The mean operative time was shorter in the TAPP group, while subcutaneous emphysema was observed in the TEP group. No differences were noted in the length of hospital stay and time to return to work (Sharma et al., 2015).

A systematic review and meta-analysis conducted by Carniero et al. compared laparoscopic total extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) approaches for bilateral inguinal hernia repair. The analysis included 11 studies with a total of 1714 patients, of whom 910 underwent TEP and 804 underwent TAPP. The findings indicated no significant differences in postoperative complications, hematoma formation, or chronic pain between the two procedures. However, the conversion rate to open repair was 2.92% for TEP and 0% for TAPP (Olivera et al, 2026). Another systematic review and meta-analysis by Tzeng et al. also compared TEP and TAPP repairs for bilateral inguinal hernia. This review included 7 studies with 1164 patients and found no significant differences in postoperative pain between the procedures (SMA -4.60, 95% CI, 53.77-44.56). However, the recurrence rate was lower in the TAPP group (OR 0.27, 95% CI, 0.11-0.67) (Tzeng et al, 2026). Pan et al. conducted a systematic review and meta-analysis of TAPP and TEP repairs for bilateral inguinal hernia, including 9 studies with 1319 patients. Of these, 846 underwent TAPP and 473 underwent TEP. The study found no significant differences in postoperative complications, length of hospital stay, or recurrence rates between the procedures. The study concluded that both TAPP and TEP are effective for the treatment of bilateral inguinal hernia (Pan et al., 2026).

Hidalgo et al. conducted a retrospective cohort study to compare total extraperitoneal (TEP) and transabdominal preperitoneal (TAPP) repairs for bilateral inguinal hernia. The study included 155 patients, with 71 undergoing TEP and 84 undergoing TAPP. No differences were observed in postoperative complications, chronic pain, or recurrence between the two procedures. However, the TAPP procedure was associated with a shorter operative time, whereas the TEP repair exhibited a higher conversion rate (8.5% vs. 0%) (Hidalgo, Guillaumes, Bachero, Holguín, et al., 2023). Additionally, Hitman et al. conducted a systematic review and meta-analysis comparing unilateral and

bilateral TEP inguinal hernia repair. This review encompassed 8 studies with a total of 18,153 patients. Bilateral TEP was associated with an increased operative time (MD: 17.59 min, 95% CI: 11.08-24.87), but no differences were found in postoperative hematoma, urinary retention, or length of hospital stay between the procedures. Notably, bilateral TEP repair was linked to a higher recurrence rate compared to unilateral TEP (Hitman et al., 2023).

Table 1

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 to compare laparoscopic and open approaches for bilateral inguinal hernia repair. The study included 128 patients, with 53 undergoing open inguinal hernia repairs and 75 undergoing laparoscopic repairs. The open procedure was associated with a higher complication rate compared to the laparoscopic procedure (3.8% vs. 1.3%), although no significant differences in recurrence rates were observed between the two methods (3.8% vs. 1.6%). Additionally, the laparoscopic repair demonstrated a shorter operative time compared to the open repair (Feliu et al., 2011). In a separate study, Agarwal et al. compared open and laparoscopic repair techniques for bilateral inguinal hernia. This study involved 1927 patients, with 1690 undergoing laparoscopic repairs and 237 undergoing open repairs. The findings indicated no significant differences in postoperative complications and recurrence rates between the two procedures (Agarwal et al., 2025).

Mahon et al. conducted a prospective randomized trial to compare transabdominal preperitoneal (TAPP) and open mesh repair for bilateral and recurrent inguinal hernia. The study involved 120 patients, with 60 undergoing TAPP repairs (41 bilateral and 19 recurrent) and 60 undergoing open mesh repairs. The findings indicated that laparoscopic repair resulted in reduced postoperative pain and a quicker return to work compared to open repair (Mahon et al., 2003). Similarly, Lelpo et al. conducted a prospective randomized study comparing laparoscopic TAPP and Lichtenstein repair for bilateral inguinal hernia. This study included 134 patients, with 61 receiving TAPP repair and 73 receiving open repairs. The TAPP repair was associated with fewer postoperative complications, reduced chronic pain, and a shorter hospital stay (Ielpo et al., 2018).

Gomez-Jurado et al. conducted a retrospective study to compare open preperitoneal repair with laparoscopic inguinal hernia repair for bilateral inguinal hernia. The study included 182 patients, with 116 undergoing open preperitoneal repairs and 66 undergoing laparoscopic repairs. The findings indicated that the open preperitoneal repair was associated with a shorter operative time; however, no differences were observed in recurrence rates or surgical site infections between the two procedures (Gomez-Jurado et al., 2026). In a separate prospective study, Yosypenko et al. compared laparoscopic total extraperitoneal (TEP) repair with open Lichtenstein repair for bilateral inguinal hernia. This study involved 93 patients, with 43 undergoing TEP repair and 48 undergoing Lichtenstein repair. The TEP repair was associated with reduced early postoperative pain and a quicker return to work, although no differences were found in overall postoperative complications (Yosypenko et al., 2025).

Table 2

Study	Study Type	N=numbers	Postoperative Complications	Recurrence
Mahon et al. (2003)	Prospective randomized trial (TAPP vs open repair)	120	Reduced postoperative complications in the TAPP group	No differences in the recurrence rates between the procedures
Feliu et al. (2010)	Prospective non-randomized study	128	Higher complications in the open repair	No differences in the recurrence rates between the procedures
Agrawal et al(2025)	Retrospective study	1927	No differences in complications between the procedures	No differences in the recurrence between the procedures

Table comparing the complications and recurrence between the open and laparoscopic repairs for bilateral inguinal hernia.

Conclusion

Bilateral inguinal hernia is a prevalent surgical condition necessitating individualized, evidence-based management. Surgical repair is the definitive treatment for patients exhibiting symptoms. Mesh-based repair is the standard of care due to its provision of durable reinforcement and low recurrence rates. Current international guidelines advocate for laparoscopic techniques, specifically TEP and TAPP repairs, for primary bilateral inguinal hernias, as these methods result in reduced postoperative pain, expedited recovery, and the capability to address both groins within the same operative field. Achieving optimal outcomes relies on appropriate patient selection, surgeon expertise, adherence

to guideline-based practices, and meticulous management of postoperative pain and recurrence risk. Ongoing advancements in minimally invasive surgery and biomaterials are anticipated to further enhance patient outcomes in the forthcoming decades.

Declaration

Conflict of interest: There is no conflict of interest

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