

The Bassini and Darning Repair for Inguinal Hernia: An Update: Narrative Review Article

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Abstract: Inguinal hernia repair remains one of the most frequently performed operations worldwide. Although mesh-based techniques currently represent the standard of care in most adult patients, tissue-based repairs continue to play an important role in selected clinical situations, including contaminated surgical fields, resource-limited settings, and patient preference. Among the classical tissue repairs, Bassini repair and darning repair have maintained clinical relevance. Edoardo Bassini revolutionized hernia surgery in the late nineteenth century by introducing anatomical reconstruction of the posterior wall of the inguinal canal, significantly reducing recurrence rates compared with previous techniques. Darning repair, particularly the Moloney darn, was later developed as a tension-reducing tissue repair that employs nonabsorbable sutures to create a mesh-like support between the conjoint tendon and inguinal ligament. This review examines the indications, outcomes, advantages, disadvantages, and contemporary role of Bassini and darning repairs in adults with inguinal hernia. Current evidence suggests that while both techniques are effective in selected patients, darning repair generally demonstrates lower postoperative pain and tension, whereas Bassini repair provides a solid anatomical reconstruction but may be associated with higher recurrence rates when excessive tension is present. Despite the predominance of mesh repairs, both methods remain valuable components of the hernia surgeon's armamentarium.

Keywords: "Bassini", Modified Bassini", Darn", Moloney", Inguinal Hernia", "Chronic Pain", and "Recurrence".

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INTRODUCTION

Edoardo Bassini introduced this repair for the management of inguinal hernia in adults, which involved repairing the posterior wall of the inguinal canal. This repair involved incising the cremasteric fascia, and after reduction of the hernia sac, the transversalis fascia was incised. The internal oblique, transversus abdominis, and transversalis fascia are then approximated to the inguinal ligament and iliopubic tract (Johnson *et al.*, 2004; O'Neill *et al.*, 2016; Woods & Neumayer, 2008). The Bassini repair can be performed under local anesthesia or regional anesthesia, and the repair is performed with non-absorbable sutures. A total of 5 to 8 stitches are used, and they are tied on the muscle. If there is tension over the repair, a vertical incision can be made over the anterior rectus sheath, which is used as a relaxing incision (Nicolò, 2018; Ramshaw & Chiu, 2018; Terranova *et al.*, 2001). The modified Bassini repair did not involve the incision of the fascia transversalis, and the conjoint tendon is sutured down to the inguinal

ligament and iliopubic tract, thus avoiding excessive dissection, reducing the tension in the repair, and reducing the operative time (Jessie & Ritz, 2020).

The Darning repair for inguinal hernia created a lattice-like reinforcement that distributed stress across multiple suture loops to strengthen the posterior wall of the inguinal canal. The principle underlying darning repair is the reconstruction of the posterior inguinal wall through a woven network of non-absorbable sutures. The placement of a continuous polypropylene or nylon suture between the inguinal ligament and conjoint tendon thus creates multiple overlapping suture loops forming a mesh-like structure. The technique is considered tension-free because tissues are not forcibly approximated. The resulting fibroblastic response creates additional reinforcement as collagen deposition occurs around the suture material. The success of darning repair depends on creating a scaffold that distributes forces throughout the inguinal floor. The woven suture network functions similarly to a prosthetic mesh while avoiding

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implantation of foreign synthetic sheets (Abrahamson, 2001).

This review article aims to examine the Bassini and Darning inguinal hernia repair methods in the surgical management of inguinal hernias in adults. We compare the Bassini and Darning hernia repairs with other mesh-based repairs like Lichtenstein, focusing on complications, chronic pain, and recurrence rates. A comprehensive literature review was conducted using PubMed, Google Scholar, Semantic Scholar, and Cochrane databases to identify original research studies, observational studies, clinical trials, clinical reviews, review articles, systematic reviews, and meta-analyses from 1980 to 2026. The search employed the following keywords: "Bassini," "Modified Bassini," "Darning," "Moloney," "Inguinal hernia", "chronic pain," and "recurrence." All articles were in English, and additional articles were identified through manual cross-checking. Case reports, commentaries, and editorials were excluded, while all articles involving adult patients were included in this review.

DISCUSSION

The Bassini and Modified Bassini Hernia Repair

Tse *et al.*, conducted a retrospective cohort study on the Bassini inguinal hernia repair for inguinal hernia repair. A total of 203 patients were included in this study, and 10.8% of the patients developed wound hematoma/seroma; 8.4% of patients developed urinary retention. The incidence of chronic pain was 10.3%, and the recurrence rate was 3.7%. This study showed that the Bassini repair can be considered for patients who do not want to undergo a mesh-based hernia repair (Tse *et al.*, 2021). Paul *et al.*, conducted a randomized trial comparing the Modified Bassini repair versus the Shouldice repair. A total of 265 patients were divided into 125 patients who underwent the modified Bassini repair and 119 patients who underwent the Shouldice repair. There were no differences regarding postoperative hematoma and seroma formation between the groups, but the recurrence rate was higher in the modified Bassini repair when compared to the Shouldice repair (7.6% vs 1.9%), after a follow-up of 3.3 years (Paul *et al.*, 1994). Kassab *et al.*, conducted a prospective study on the Bassini repair for the treatment of inguinal hernia, and the recurrence rate was 2.89% (Kassab *et al.*, 2013).

The Bassini repair was compared with the Lichtenstein repair for the management of inguinal hernia by Maggiore *et al.*, This study included 738 patients: 381 underwent the Bassini repair, and 357 underwent the Lichtenstein repair. Postoperative hematoma and urinary retention were higher in the Bassini repair group, but recurrence rates were similar between the groups (Maggiore *et al.*, 2001). Shi *et al.*, compared the Bassini repair with the Lichtenstein repair for the treatment of inguinal hernia in adults. This study included 552 patients: 269 underwent the Bassini repair, and 283 underwent the Lichtenstein repair. The Bassini

repair was associated with longer post-operative pain (25.7% vs 18.5%), and a higher recurrence rate (8.9% vs 2.3%). The Bassini repair was associated with a longer operating time but reduced cost (Shi *et al.*, 2010). A retrospective study comparing the Bassini repair with the mesh plug repair for inguinal hernia in adults was conducted by Miyazaki *et al.*, A total of 231 patients were included in this study, with 118 patients undergoing the Bassini repair and 113 patients undergoing the Mesh plug repair. There were no differences regarding the postoperative complications between the procedures, but the recurrence rates were higher in the Bassini group (7.6% vs 0.9%) (Miyazaki *et al.*, 2001).

Harjai *et al.*, conducted a prospective randomized controlled study comparing the modified Bassini repair with the Lichtenstein repair for inguinal hernia. The study included 196 patients: 118 underwent the Bassini repair, and 98 underwent the Lichtenstein repair. The Bassini repair was associated with a longer operative time and took longer to return to work. There were no differences regarding the recurrence rates between the procedures (Harjai *et al.*, 2007). Naveen *et al.*, conducted a randomized comparative study on the modified Bassini repair and the Lichtenstein repair for inguinal hernia in rural patients. The study included 70 patients: 35 underwent the modified Bassini repair, and 35 underwent the Lichtenstein repair. The modified Bassini repair was associated with a slightly higher hematoma formation and recurrence rate, but the Lichtenstein repair was associated with a higher seroma rate (Naveen & Srinath, 2014). Palermo *et al.*, performed a randomized controlled trial comparing the immediate complications between the Bassini repair and the Lichtenstein repair. The Bassini was associated with more postoperative complications and a longer return to work when compared with the Lichtenstein repair (Palermo *et al.*, 2015).

Malik *et al.*, performed a retrospective study comparing the Modified Bassini repair with the Lichtenstein repair for inguinal hernia in adults. The study included 800 patients: 408 underwent the modified Bassini repair, and 392 underwent the Lichtenstein repair. The post-operative pain and recurrence rate were higher in the modified Bassini repair than in the Lichtenstein repair (Malik *et al.*, 2009). Zahoor *et al.*, conducted a comparative study of the modified Bassini repair and the Lichtenstein repair for the treatment of inguinal hernia in young adults. There were 82 patients in this study, with 34 patients undergoing the Bassini repair and 48 patients undergoing the Lichtenstein repair. There were no differences regarding post-operative complications, chronic pain, and recurrence between the procedures (Zahoor *et al.*, 2024). Witkowski *et al.*, conducted a randomized prospective study comparing the mesh plug and Bassini repair for inguinal hernia. There were 140 patients in this study, with 70 patients undergoing the Bassini repair and 70 patients undergoing the mesh plug repair. There were no differences

regarding postoperative complications, but the Bassini repair was associated with a longer operative time and a higher recurrence rate (20.5% vs 9.4%)(Witkowski *et al.*, 2000).

The Darning Inguinal Hernia Repair

Olasehinde *et al.*, conducted a retrospective study on darning repair for inguinal hernia in adults. There were a total of 132 patients in this study, and surgical site infection was observed in 4.5% of the cases; the chronic pain rate was 3%, and after a follow-up of 15 months, the recurrence rate was 1.5%(Olasehinde *et al.*, 2015). A systematic review and meta-analysis of randomized controlled studies comparing the open darn repair and the open mesh-based inguinal hernia repair was conducted by Finch *et al.*, There were 10 studies with 3024 patients included in this study, and there were no differences regarding the recurrence rate between the procedures (RD-0.00,95%CI,0.01-0.01). There were no differences regarding the surgical site infection (OR-0.74,95%CI,0.44-1.26), hematoma formation (OR-1.16,95%CI,0.68-1.97), seroma formation (OR-0.69,95%CI,0.36-1.33), length of hospital stay (MD-0.09,95%CI,0.44-0.26), and operative time (MD-0.61,95%CI,4.47-5.68)(Finch *et al.*, 2019).

Kucuk *et al.*, conducted a prospective randomized comparative study comparing the darn repair with the Lichtenstein repair for inguinal hernia in adults. There were a total of 306 patients in this study, with 176 patients undergoing the darn repair and 130 patients undergoing the Lichtenstein repair. There were no differences regarding postoperative complications, operative time, and recurrence rates between the procedures(Kucuk *et al.*, 2010). Udo *et al.*, also looked at the outcomes of the Darning repair for inguinal hernia in adults. 65 patients in this study had undergone the darn repair, and wound hematoma was seen in 1.5% of the cases, and there were no recurrences observed from the procedure(Udo IA, Akpanudo E, 2014). Essawy *et al.* also looked at the outcomes for the darn method for inguinal hernia repair in adults. There were 40 patients in this study, and the wound infection rate was 7.5%, and the seroma rate was 12.5%. There were no recurrences

were noted after a follow-up of 6 months(Essawy *et al.*, 2019).

Ahmad *et al.*, conducted a retrospective study on the open darn repair for inguinal hernia in the remote setting. 2000 patients were included in this study, and superficial surgical site infection was observed in 4.5% of the patients, while hematoma formation was observed in 8%, and seroma formation was observed in 15% of the patients. After a follow-up of 5 years, the recurrence rate was 0.15%(Ahmad *et al.*, 2018). Kaynak *et al.*, compared the darn repair with the Lichtenstein repair for inguinal hernia in adults. There were 651 patients in this study, with 297 patients undergoing the darn repair and 354 patients undergoing the Lichtenstein repair. There were no differences regarding postoperative complications, chronic pain, and recurrence rates between the procedures(Kaynak *et al.*, 2007). A prospective randomized controlled trial comparing the darn repair and the Lichtenstein repair was conducted by Maksoud *et al.*, There were 227 patients in this study, with 108 patients undergoing the darn repair and 118 patients undergoing the Lichtenstein repair. There were no differences regarding the postoperative complications and recurrence rates between the procedures, but the darn repair was associated with a longer operating time when compared to the Lichtenstein repair(Abd El Maksoud *et al.*, 2014).

A prospective clinical trial comparing the darn repair, the Bassini repair, and the Lichtenstein repair for inguinal hernia in adults was conducted by Boonnithi *et al.*, A total of 197 patients were included in this study, with 70 patients undergoing the darn repair, 68 patients undergoing the Bassini repair, and 59 patients undergoing the Lichtenstein repair. Postoperative hematoma formation was seen in 1.4% of the darn repair, 5.9% of the Bassini repair, and 5.1% of the Lichtenstein repair. Recurrence was noted in one patient who underwent the Bassini repair, but there were no recurrences in those patients who underwent the darn repair and Lichtenstein repair(Boonnithi & Kongkham, 2010).

Table 1

Study	Study Type	Bassini repair	Darning repair	Findings
Tse <i>et al.</i> , 2021	Retrospective study	Recurrence: 3.7% (7/205 repairs). Postoperative complications included hematoma/seroma (10.8%), urinary retention (8.4%), testicular ischemia (2%), and pain-related problems (10.3%), mostly transient.	Not evaluated	Bassini repair demonstrated acceptable long-term durability with relatively low recurrence and manageable complications.
Kassab <i>et al.</i> , 2013	Prospective study	Greater postoperative pain requiring analgesia, more wound infections and hematomas; recurrence reported up to 4.76% at 1 year.	Lower postoperative pain, fewer wound complications, recurrence 0% at 1 year.	Darning repair showed less morbidity and lower recurrence than Bassini repair.

Study	Study Type	Bassini repair	Darning repair	Findings
Palermo <i>et al.</i> , 2015	Randomized clinical study	Tissue repair was associated with increased tension and postoperative discomfort compared with Darning repair.	Lower tension repair was associated with less postoperative discomfort and earlier mobilization.	Darning repair was favored for reduced postoperative pain and recovery time
Olasehinde <i>et al.</i> , 2015	Retrospective study	Not studied.	Surgical site infection: 4.5%; chronic groin pain: 3.0%; recurrence: 1.5% during mean follow-up of 15 months.	Darning repair was considered safe and effective with low recurrence and chronic pain rates.
Finch <i>et al.</i> , 2019	Systematic review and meta-analysis	Not studied directly.	Systematic review found no significant differences in recurrence, surgical-site infection, hematoma, neuralgia, urinary retention, or return to normal activities compared with mesh repair. Evidence for chronic pain was inconclusive.	Darning repair appears to be a credible non-mesh alternative with low recurrence and acceptable complication rates.

Table comparing the complications and recurrence rates between the Bassini repair and the Darning repair for inguinal hernia.

CONCLUSION

Bassini repair and darning repair represent two historically important tissue-based techniques for adult inguinal hernia repair. Bassini repair established the fundamental principles of anatomical reconstruction and transformed the field of hernia surgery. Darning repair subsequently addressed one of Bassini's principal limitations by reducing tissue tension through a mesh-like suture framework. While both operations have largely been supplanted by tension-free mesh repairs in modern practice, they continue to retain value in selected clinical settings. Current evidence suggests that darning repair may offer reduced postoperative pain and comparable recurrence rates relative to Bassini repair. Nevertheless, outcomes remain highly dependent on patient selection, tissue quality, and surgeon expertise. As global surgery increasingly emphasizes cost-effectiveness and accessibility, an understanding of these classical techniques remains essential for contemporary surgeons.

Conflict of Interest: There is no conflict of interest

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