Robotic Repair of Recurrent Inguinal Hernia with Keyhole Mesh Encirclement of the Spermatic Cord

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Introduction

Inguinal hernia repair is one of the most commonly performed surgical procedures worldwide. Recurrent hernias present a significant clinical challenge, with recurrence rates rising after subsequent repairs. Both patient-related factors—such as smoking, diabetes, and obesity—and technical factors, including inadequate mesh coverage, contribute to failure. The keyhole mesh technique, which creates a slit to accommodate the spermatic cord, has been proposed to improve circumferential coverage and reduce recurrence, though evidence remains mixed.

Case

A 55-year-old man presented with a third recurrence of a left inguinal hernia. His surgical history included an open repair in 2008 and an emergent robotic repair with ProGrip mesh in 2024, both of which failed. He had multiple modifiable risk factors, including active tobacco use, uncontrolled diabetes, and obesity (BMI 31.5). On examination, he had a manually reducible left inguinal bulge without systemic or gastrointestinal symptoms, and no right-sided hernia was present.

During robotic reoperation, an indirect left inguinal hernia was identified lateral to the inferior epigastric vessels. The previous mesh had not been encircled around the spermatic cord, likely contributing to recurrence. A peritoneal flap was created, and the hernia sac was reduced. A new ProGrip mesh was placed using a keyhole technique to accommodate the spermatic cord, with V-loc sutures securing the slit and tacking the mesh to Cooper's ligament. The procedure was completed without complications.

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Figures

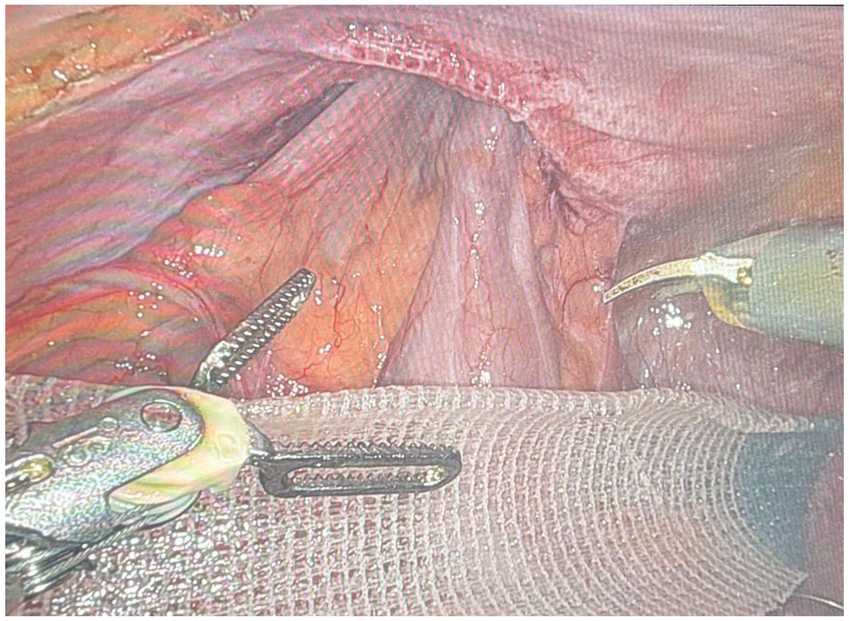

Figure 1. Robotic intraoperative view of the recurrent indirect left inguinal hernia lateral to the inferior epigastric vessels.

Figure 2. Robotic intraoperative view of the new ProGrip mesh placed using a keyhole incision technique.

Discussion

This case highlights the complex interplay between patient-related and technical factors contributing to recurrent inguinal hernias [3]. The patient presented with multiple modifiable risk factors that significantly increased his recurrence risk [3]. Current smoking is an independent predictor of hernia recurrence (odds ratio, 5.4; 95% confidence interval, 1.0–29.3) [4]. The patient's uncontrolled diabetes also contributed to elevated risk, as diabetes has been associated with increased reoperation rates following inguinal hernia repair [3]. Additionally, obesity has been shown to be significantly more common in recurrent hernia patients compared to those without recurrence [5].

Beyond patient factors, the intraoperative findings revealed a critical technical deficiency in the previous repair: the ProGrip mesh had not been encircled around the spermatic cord structures. This incomplete coverage likely left gaps in the mesh repair, predisposing to recurrence [8]. Previous studies have identified inadequate mesh overlap and skip areas, particularly near the testicular vessels, vas deferens, and epigastric vessels, as technical factors contributing to higher recurrence rates [8, 9].

The keyhole mesh technique addresses this issue by creating a slit in the mesh that allows complete encirclement of the spermatic cord while maintaining 360-degree coverage of the myopectineal orifice [6]. In a recent propensity score-adjusted analysis of 611 hernias, the slit-mesh technique was associated with reduced recurrence and shorter operative time compared to non-slit mesh, with no differences in chronic pain or postoperative complications [6]. However, a meta-analysis of five studies showed no significant difference in overall recurrence rates between slit and non-slit techniques, though this may have been limited by sample size and heterogeneity [7].

Conclusion

Recurrent inguinal hernias represent a multifactorial challenge requiring careful attention to both patient-related risk factors and operative technique [3]. In this high-risk patient with multiple prior recurrences, robotic repair using a keyhole mesh technique allowed complete circumferential encirclement of the spermatic cord and restoration of full myopectineal coverage, addressing a critical technical deficiency identified in the prior repair [8]. This approach may reduce recurrence by preventing mesh gaps around cord structures, particularly in patients predisposed to failure [8]. Although emerging data suggest potential advantages of slit or keyhole mesh configurations, further randomized studies are needed to define optimal mesh design and fixation strategies [6]. Independent of technique, optimization of modifiable risk factors—including smoking cessation and glycemic control—remains essential to improving long-term outcomes [3].