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Case Report

Laparoscopic repair of inguinal hernia using GORE SYNECOR biomesh

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ABSTRACT

Inguinal hernia repair, historically performed through open surgery, has evolved to favour laparoscopic techniques due to reduced recovery time, minimized pain, and lower recurrence rates. The type of mesh used in repair plays a crucial role in surgical outcomes. Synthetic meshes are known for their durability and tensile strength, while biological meshes offer better biocompatibility and reduced risk of chronic inflammation. Recently, hybrid meshes such as GORE SYNECOR have emerged, integrating the strengths of both types. These composite meshes provide structural support while promoting tissue integration, yielding promising results in terms of low recurrence rates and improved patient-reported outcomes post-surgery. This report discusses an 81-year-old male with a left-sided indirect inguinal hernia managed through laparoscopic transabdominal preperitoneal (TAP) repair, utilizing GORE SYNECOR biomesh. His clinical presentation, surgical course, and recovery highlight the effectiveness of hybrid meshes for elderly patients, offering both durability and reduced complication risks. The use of a hybrid composite intraperitoneal device like the GORE SYNECOR mesh for inguinal and abdominal hernia repair demonstrates encouraging early outcomes. These include low recurrence rates, a strong safety profile, and notable enhancements in patients' health-related quality of life extending beyond one year.

Keywords: Hybrid mesh, Inguinal hernia repair, Laparoscopic

INTRODUCTION

Inguinal hernia repair is one of the most common surgical procedures performed worldwide, reflecting the high prevalence of inguinal hernias in the general population. Traditionally, the treatment for inguinal hernias involved open surgical repair, which provided effective results but was associated with longer recovery times and greater postoperative pain. Over recent decades, there has been a gradual shift towards laparoscopic repair due to its minimally invasive nature, reduced postoperative discomfort, faster recovery, and better aesthetic outcomes.[1]

The choice of mesh in hernia repair is pivotal for successful outcomes as it strengthens the affected area and minimizes recurrence risks. Available options include synthetic, biological, and hybrid meshes. Synthetic meshes, such as polypropylene, offer excellent durability and have demonstrated effectiveness in reducing hernia recurrence. However, they may result in complications like chronic pain or infections due to their permanent nature.[2,3] Biological meshes, made from human or animal tissue, exhibit better biocompatibility and integrate more seamlessly with host tissue, lessening rejection and infection risks but may lack long-term durability, especially for highly active patients. [2,3] Hybrid meshes, such as the GORE SYNECOR, are designed to merge the strength and durability of synthetic components with the biocompatibility of biological ones. These hybrid meshes aim to optimize patient outcomes by offering strong, reliable repairs with a reduced risk of chronic complications, showing promising outcomes with low recurrence rates, a favourable safety profile, and improved postoperative quality of life.[4,5]

This case report details the laparoscopic management of a left indirect inguinal hernia using GORE SYNECOR biomesh, a hybrid mesh designed to combine the durability of synthetic materials with the biocompatibility of bioabsorbable components. This approach offers advantages such as reduced inflammation, minimized risk of chronic pain, and improved long-term patient comfort, thereby demonstrating its efficacy as a viable and advanced treatment option for hernia repair.[2,3]

CASE REPORT

An 81-year-old male presented with a longstanding history of left-sided groin pain and a visible lump. The pain was localized along the inguinal ligament and occasionally radiated to the buttock, with pressure on the groin reducing discomfort.

His medical history included a right thoracotomy and upper lobe segmentectomy for lung cancer in 2012, treated successfully without recurrence. Additionally, he had a history of hypercholesterolemia and hypertension, both well-controlled with medications, and recurrent urinary tract infections (UTIs).

The patient is notably fit for his age, as he continues to exercise regularly and independently manages the operation and maintenance of his boat.

Physical examination showed a reducible left-sided groin lump with a positive cough impulse, consistent with ultrasound findings. An ultrasound revealed an indirect inguinal hernia containing fat and bowel, completely reducible at rest. The hernia's neck measured 16 mm, and the sac dimensions were 44×23×65 mm. This confirmed the clinical diagnosis of an indirect inguinal hernia. His medical history included a right thoracotomy and upper lobe segmentectomy for lung cancer in 2012, managed successfully without recurrence, along with controlled hypercholesterolemia and hypertension.

Given his active lifestyle and the impact of symptoms on his quality of life, surgical intervention was deemed necessary.

Surgical technique

Under general anesthesia, the patient was positioned supine, and prophylactic antibiotics, compression stockings, and sequential compression devices were administered.

Pneumoperitoneum was achieved via a 10 mm infraumbilical incision. Diagnostic laparoscopy confirmed a reducible left indirect inguinal hernia. Two 5 mm ports were placed under direct vision in the left and right lateral positions. The peritoneum was incised over the medial umbilical fold and extended laterally, and the pre-peritoneal space was dissected. The direct hernia sac was reduced, and the cord structures were carefully identified and protected.

A 10×15 cm GORE SYNECOR biomesh was positioned in the preperitoneal space, secured with absorbable tacks to the pubic bone and anterior abdominal wall. The peritoneum was tacked back into position (Figure 1).

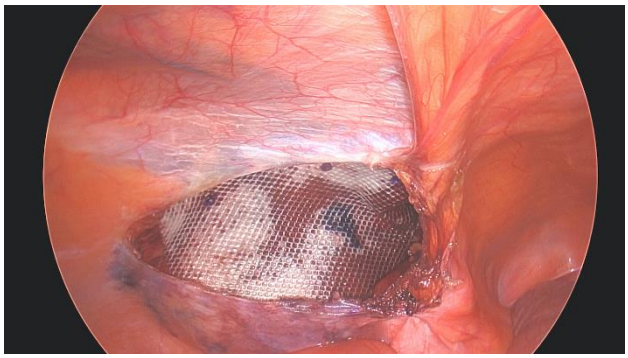

Figure 1: Laparoscopic repair of left indirect inguinal hernia with GORE SYNECOR mesh.

The Hassan port site was closed with PDS sutures to the fascia, and the skin was approximated using monocryl.

Postoperative course

The patient recovered well postoperatively, with no immediate complications. He was advised to avoid heavy lifting or abdominal strain for six weeks due to his active lifestyle. At his six-week follow-up, he reported no pain and his hernia repair held up well even after prolonged physical exertion. Physical examination showed no signs of recurrence, and he was discharged from further follow-up.

DISCUSSION

The use of hybrid meshes in hernia repair represents an important advancement in surgical practice, aiming to combine the best characteristics of synthetic and biological materials. Traditional synthetic meshes, typically made from materials such as polypropylene, are well-established for their durability and efficacy in reducing recurrence rates. However, they carry the risk of complications such as chronic pain, foreign body reactions, and potential infection due to their permanent presence in the body.[2,3] On the other hand, biological meshes, which are derived from human or animal tissue, provide improved biocompatibility, promoting integration with host tissues and reducing inflammatory responses. Despite these benefits, biological meshes may lack the long-term durability needed for patients with higher physical demands or comorbidities that require stronger reinforcement.[2,3]

Hybrid meshes have been developed to bridge the gap between these two types of materials. One notable

example is the GORE SYNECOR mesh, which is designed with a composite structure that combines a durable synthetic mesh with bioabsorbable layers. It combines non-absorbable polypropylene with a bioabsorbable polyglycolic acid/trimethylene carbonate (PGA/TMC) layer, offer the advantage of robust reinforcement and reduced chronic pain due to minimized foreign body reactions.[4,5] Approximately six to seven months' post-implantation, the bioabsorbable elements of the mesh are fully degraded, leaving behind only the durable polytetrafluoroethylene (PTFE) monofilament structure. This mesh is designed for intraperitoneal placement, suitable for both underlay and intraperitoneal onlay techniques, with nonabsorbable sutures recommended for secure fixation. When positioned adjacent to the fascia, the mesh's 3-dimensional scaffold encourages tissue integration. Conversely, when placed near visceral surfaces, the nonporous intraperitoneal barrier film effectively minimizes tissue adhesion, reducing potential complications associated with visceral contact.[4]

Clinical studies on hybrid meshes, including GORE SYNECOR, have shown promising results. These meshes have been associated with low recurrence rates and an overall favourable safety profile. Patients receiving hybrid meshes have reported improvements in health-related quality of life (HR-QOL) postoperatively, with reduced incidence of chronic pain and infection.[5,6] The bioabsorbable components, which gradually degrade over time, minimize the long-term foreign body response, leading to more natural tissue healing and reduced inflammation.

However, the use of hybrid meshes is not without challenges. Cost considerations remain a significant factor, as these advanced materials are often more expensive than traditional synthetic options. Additionally, while initial data indicates positive outcomes, further long-term studies are necessary to evaluate their performance over a decade or more to confirm sustained efficacy and safety.[7]

Overall, hybrid meshes provide a compelling option for hernia repair, particularly for patients who may be at higher risk of complications from synthetic-only meshes or who require durable support due to physical activity or comorbid conditions. By blending the benefits of both synthetic and biological elements, hybrid meshes like GORE SYNECOR have the potential to set a new standard in hernia repair, balancing long-term strength with biocompatibility to optimize patient outcomes.

CONCLUSION

In this case report, the patient exhibited a smooth and successful recovery at the six-week follow-up following a laparoscopic TAP repair with GORE SYNECOR mesh. Although the follow-up period was limited, existing studies have demonstrated that biosynthetic meshes can lead to effective outcomes extending beyond one year. This supports the potential of hybrid meshes to provide durable and safe solutions in hernia repair.

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