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## Case Report

# Repair of a Recurrent Direct Inguinal Hernia in a Patient with a History of Mesh Infection -

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## ABSTRACT

While inguinal hernia repair is among the most commonly performed surgical procedures, little data exists to guide the management of a patient with a recurrent inguinal hernia following mesh excision performed for mesh infection. Arguments exist for whether or not to utilize mesh again in this population, with the most common pro-prosthesis position being that, following mesh excision, the defect tends to be large, and would be difficult to approximate without significant tension without use of a prosthesis. A common argument against mesh use in this population is that the patient's history of mesh infection increases their risk of future mesh infection.

A 39-year-old gentleman presented with a three week history of a bulging right-sided groin mass. In 2009, the hernia was repaired laparoscopically with mesh, and in 2010, the patient had a mesh infection, following which the mesh was excised in an open surgery. The patient was asymptomatic for five years, until he experienced symptomatic recurrence of his hernia. The decision was made to repair the hernia in an open technique with mesh. This case exemplifies the current debate on the use of mesh in patients with recurrent inguinal hernia following mesh excision for mesh infection.

**Keywords:** Inguinal Hernia; Mesh Infection; Recurrent Hernia; Hernia Repair; Herniorrhaphy

## ABBREVIATIONS

WBC: White Blood Cell

## INTRODUCTION

According to the Society for Surgery of the Alimentary Tract, there are an estimated 750,000 inguinal hernia repairs performed each year in the United States [1]. While many hernias are asymptomatic, there is approximately a 2% risk of strangulation for a patient with an inguinal hernia each year [2]. Thus, it is important for patients to highly consider elective hernia repair to prevent complications including incarceration, strangulation, or bowel obstruction [3]. However, as with all surgeries, herniorrhaphy carries risks as well, including a 1% risk of infection or significant hematoma, a 5% risk of chronic inguinodynia, and a 2-5% risk of hernia recurrence necessitating further surgery [1,4]. This case report focuses on repair of a recurrent inguinal hernia with previous mesh infection and removal.

## CASE PRESENTATION

Our patient is a 39-year-old gentleman who presented to the emergency department with a three week history of a bulging right-sided groin mass. He reports that it was initially repaired with a laparoscopic right inguinal herniorrhaphy with mesh in 2009 at an outside hospital. The following year he developed right groin pain with erythema, edema, and fever. At that time, the mesh was removed in an open surgery, and the wound was allowed to heal by secondary intention. Following, the patient was asymptomatic for five years until a painful, enlarging bulge reemerged in his right groin. He reports that the pain is sharp, non-radiating, and occurs regardless of position. Additionally, he states that he has never attempted to manually reduce the mass himself. He denies chronic cough, obstructive urinary symptoms, and chronic constipation.

On examination, the patient is afebrile, and normotensive. Abdominal examination is significant for a well-healed 3 cm right inguinal incisional scar parallel to inguinal ligament, with hypoesthesia below the incision and in the right lateral scrotal region, and normal bowel sounds. His abdomen was non-tender, and while upright, diffuse mass effect was noted to be subtending the incisional scar, which was more pronounced upon cough. The mass was very easily reducible without evidence of incarceration. No left inguinal hernia or umbilical hernias were noted. The patient expressed tenderness upon palpation of the right inguinal canal.

Initial laboratory studies revealed a white blood cell count of 8.9, and glycated hemoglobin of 5.3. Computed tomography of the pelvis without contrast was performed to identify the precise anatomy in this patient with a recurrent hernia with history of infection, which showed a small right inguinal hernia in the proximal right inguinal canal containing a small portion of the bladder. The size of the defect was measured to be 1.2 x 1.8cm.

Elective outpatient open right direct inguinal herniorrhaphy was performed; the case was not urgent as he did not present symptoms of strangulation, incarceration, or bowel obstruction. The decision was made to use a mesh prosthesis, because it was determined that mesh would likely need to be used in order to bridge the widened gap in the abdominal wall created by two prior surgeries in the inguinal region. Intraoperatively, a small amount of urinary bladder was noted to protrude into the hernia sac. This was reduced satisfactorily without consequence. The patient recovered satisfactorily and was discharged the same day. After one year of follow-up, he has had no recurrence of his hernia or complications of the repair.

## DISCUSSION

Although open tension-free mesh repair is the present gold standard for managing inguinal hernias, the literature is rather sparse on management of recurrent inguinal hernia following mesh removal performed for mesh infection [5]. The most common bacterial isolates from mesh infections include *Staphylococcus aureus*, coagulase-negative staph able to form biofilms, and enteric gram-negative rods [6]. Mesh infections are managed with excision of the mesh and wound culture-driven antibiotics [6]. Surprisingly, recurrence of inguinal hernia after mesh removal is only 6.7% according to a large retrospective review [7]. The reason is postulated to be that the implanted mesh stimulates fibroblast and inflammatory infiltrate, resulting in a dense fibrous "neo-fascia" that remains even after mesh removal, preventing herniation of abdominal contents into that space [8]. To prevent infection of this mesh, some experts recommend use of antibiotic-soaked mesh or antibiotic lavage prior to closure to prevent bacterial adherence to the implanted foreign body. However, this technique is controversial due to lack of evidence of efficacy, increased cost, and possibility of antimicrobial resistance, and is therefore not widely accepted in the surgical community [9]. However, traditional intravenous perioperative antibiotic administration has been proven efficacious by numerous studies [10]. Additionally, certain varieties of mesh are at greater risk of mesh infection, particularly multifilament polyester. In this patient, a Prolene mesh was used which is noted to have a relatively low infection risk index [11]. However, the literature



**Figure 1:** Small 1.8 x 1.2 cm right-sided inguinal hernia containing a small portion of the urinary bladder, extending into the proximal right inguinal canal. The condition of the right inguinal region is consistent with post-surgical changes.

does not contain a randomized clinical trial comparing variety of mesh with incidence of mesh infection.

Interestingly, recurrence of inguinal hernia after mesh excision for infection is rare, so there is little dedicated literature on the subject. Several questions can be raised about this population, including the question of whether or not to use a mesh implant in someone who has already experienced mesh infection. In general, it is known that use of a patient's own tissue rather than a foreign body has reduced risk of infection [12]. One rarely used technique of autologous reconstruction of the inguinal region includes the pedicled fascia lata flap [12]. However, this requires an additional incision and prolonged time under anesthesia to harvest tissue for grafting.

Deciding on the approach to a recurrent inguinal hernia centers on the approach to the prior repair. If the prior repair was laparoscopic, the recurrent repair should likely be open, and vice-versa. The rationale is to avoid previously dissected tissue planes [13]. This patient had undergone a laparoscopic repair initially, followed by an open excision of infected mesh, thus open repair was selected as he had significant scar tissue that would make laparoscopic repair very challenging technically.

Additionally, the patient's hernia described in the case contained urinary bladder mucosa, which has been described in the literature to incarcerate and interfere with urinary function [14]. Randomized controlled clinical trials strongly support the use of surgery rather than watchful waiting in patients with symptomatic inguinal hernias to reduce the need for emergent surgery and improve quality of life [14]. However, this patient's complex right inguinal history includes previous surgery complicated by a mesh infection, thus he was at higher risk of operative complications. While some hernia repairs are done laparoscopically, this patient was not considered a candidate for this variety of repair as he has had two surgeries to the right inguinal region, likely causing significant scar tissue to the preperitoneal region [15].

The most critical steps to prevent complications from an inguinal hernia repair are the identification and protection of the ilioinguinal nerve to prevent chronic groin pain, and identification and protection of the spermatic cord to prevent damage to its contents [16].

## CONCLUSION

Recurrent inguinal hernia in patients with previous mesh excision

performed for mesh infection is a challenging subject. Surgical decision-making centers on whether to use of further mesh in spite of previous prosthetic infection, and whether to pursue laparoscopic or open approach to repair. Further research is needed to improve clinical outcomes in this patient population and to clarify practice guidelines.

## Consent

Written informed consent was obtained from the patient for publication of this case report and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal.

## Authors' Contributions

DC synthesized the case presentation and performed the literature review. RW wrote the conclusion and organized references.

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