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Case Report

Delayed Mesh Erosion into the Urinary Bladder as a Late Complication of Inguinal Hernia Repair: A Case Report

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ABSTRACT

Prosthetic mesh repair is widely accepted as the standard treatment for inguinal hernia due to its low recurrence rates and favorable long-term outcomes. Nevertheless, mesh-related complications may occur, sometimes many years after the initial procedure. Among these, migration and erosion of mesh into adjacent organs represent rare but clinically significant late sequelae. Intravesical mesh erosion is particularly uncommon and may present with nonspecific urinary symptoms, often resulting in delayed diagnosis.

We describe a case of delayed erosion of polypropylene mesh into the urinary bladder nearly a decade after open inguinal hernia repair. The patient presented with persistent lower urinary tract symptoms, recurrent urinary tract infections, and hematuria. Radiological imaging and cystoscopic evaluation confirmed intravesical mesh migration. Surgical removal of the mesh with partial cystectomy resulted in complete resolution of symptoms.

This case underscores the importance of maintaining clinical suspicion for mesh-related complications in patients with unexplained urinary symptoms and a history of hernia repair. Early recognition and coordinated multidisciplinary management are essential to prevent morbidity. A review of current literature regarding pathogenesis, diagnostic evaluation, and treatment strategies is also presented.

Keywords: Intravesical mesh migration; Inguinal hernia repair; Mesh erosion; Bladder complications; Late surgical complication

INTRODUCTION

Tension-free mesh repair has transformed the surgical management of inguinal hernias and is currently regarded as the preferred operative approach worldwide.[1,2] The use of synthetic mesh reduces recurrence rates and improves postoperative recovery when compared with tissue-based repairs.[3] Despite these advantages, prosthetic materials are not without risk, and mesh-related complications have increasingly been recognized with long-term follow-up.[4,5]

Reported complications include infection, chronic pain, adhesion formation, fistula development, and mesh migration into adjacent organs.[6,7] Mesh migration is uncommon but potentially serious, particularly when it involves hollow viscera such as the urinary bladder or bowel.[8] Intravesical mesh erosion is a rare phenomenon, most frequently reported following inguinal or femoral hernia repair.[9,10]

Clinical presentation is often nonspecific and may include recurrent urinary tract infections, hematuria, dysuria, or irritative lower urinary tract symptoms.[11] Because these manifestations mimic common urological conditions, diagnosis may be significantly delayed.[12] Radiological imaging and cystoscopy play central roles in identifying intravesical mesh.[13,14] Definitive management generally requires surgical removal of the migrated mesh along with repair of the bladder defect.[15]

We present a case of delayed erosion of inguinal hernia mesh into the urinary bladder nearly nine years after surgery, highlighting diagnostic challenges and management considerations, along with a review of relevant literature.

CASE PRESENTATION

A 62-year-old male presented to the urology clinic with a two-year history of recurrent urinary tract infections accompanied by dysuria, urinary frequency, and intermittent episodes of visible hematuria. He reported repeated courses of antibiotic therapy prescribed at multiple healthcare facilities, which provided only temporary symptomatic relief.

His surgical history was significant for open right inguinal hernia repair with polypropylene mesh implantation performed nine years earlier. The postoperative course had been uneventful, and he remained asymptomatic for several years following surgery.

Physical examination revealed stable vital signs and an unremarkable abdominal examination. The previous inguinal incision was well healed without evidence of hernia recurrence. Digital rectal examination demonstrated mild benign enlargement of the prostate without nodularity.

Laboratory investigations showed mild leukocytosis and persistent microscopic hematuria. Urine culture repeatedly yielded growth of Escherichia coli. Renal function tests were within normal limits.

Ultrasonography of the urinary tract demonstrated focal thickening of the anterior bladder wall with an echogenic intraluminal structure. Contrast-enhanced computed tomography of the abdomen and pelvis revealed a linear hyperdense structure projecting into the bladder lumen, associated with localized inflammatory changes and wall thickening. These findings raised suspicion of an intravesical foreign body, likely migrated surgical mesh.

Diagnostic cystoscopy confirmed the presence of synthetic mesh protruding through the bladder wall. The exposed mesh segment was partially encrusted with calculous deposits, and surrounding mucosa appeared inflamed but without suspicious neoplastic features.

After multidisciplinary consultation between urology and general surgery teams, surgical removal was planned. Through a lower midline incision, dense adhesions were identified between the bladder and anterior abdominal wall. A portion of polypropylene mesh was found penetrating the bladder wall.

The involved bladder segment was excised en bloc with the eroded mesh. Partial cystectomy was performed, followed by layered bladder reconstruction. Residual mesh fragments were removed where safely feasible. No recurrent hernia was identified intraoperatively.

Histopathological examination revealed chronic inflammatory changes with foreign body giant cell reaction, without evidence of malignancy.

The patient's postoperative recovery was uneventful. A urethral catheter was maintained for 10 days, and cystography confirmed intact bladder repair prior to catheter removal. At six-month follow-up, the patient remained symptom-free with no further urinary tract infections or hematuria.

DISCUSSION

Intravesical mesh erosion is an infrequent but clinically important complication of prosthetic hernia repair.[6,9] Although synthetic mesh has substantially improved hernia surgery outcomes, increasing long-term use has led to greater recognition of delayed adverse events.[4,5]

Mechanisms of Mesh Migration

Two principal mechanisms have been proposed to explain mesh migration. Primary mechanical migration occurs when mesh becomes displaced due to inadequate fixation or external mechanical forces.[8] Secondary migration, which is more commonly implicated in delayed presentations, results from chronic inflammatory processes that gradually erode surrounding tissues, allowing mesh to penetrate adjacent organs.[7,16]

Foreign body reaction, infection, and pressure-induced tissue necrosis contribute to progressive erosion.[17] Polypropylene mesh is known to provoke inflammatory responses that may facilitate this process in susceptible

individuals.[18]

Timing of Presentation

The interval between hernia repair and clinical manifestation varies widely, ranging from months to decades.[6,19] Delayed presentation is typical because erosion progresses gradually and symptoms are often subtle initially. The nine-year interval observed in our case aligns with previously reported delayed complications.[20]

Clinical Features

Symptoms are usually related to bladder irritation or infection. Recurrent urinary tract infections, hematuria, dysuria, and frequency are common presenting complaints.[11,21] Mesh exposure may also serve as a nidus for bladder stone formation.[22] In severe cases, fistula formation or systemic infection may develop.[23]

Due to overlap with common urological disorders, diagnosis is frequently delayed unless prior surgical history is carefully considered.[12]

Diagnostic Evaluation

Radiological imaging provides valuable diagnostic information. Ultrasonography may detect intravesical abnormalities but lacks specificity.[14] Computed tomography offers superior anatomical delineation and helps identify foreign bodies and associated inflammatory changes.[24] Cystoscopy remains the definitive diagnostic modality, enabling direct visualization and assessment of mucosal involvement.[13]

Differential diagnoses include bladder malignancy, chronic cystitis, and intravesical calculi.[25]

Management Strategies

Conservative treatment is ineffective because the underlying foreign body persists.[15] Definitive management requires removal of the migrated mesh and repair of the bladder defect.

Surgical approaches vary according to extent of involvement and may include open, laparoscopic, or endoscopic techniques.[26] When mesh is deeply embedded, partial cystectomy is frequently necessary.[27] Multidisciplinary collaboration between general surgeons and urologists improves outcomes.[28]

Prevention

Meticulous surgical technique is essential to minimize risk. Secure mesh fixation, careful placement, and avoidance of direct contact between mesh and bladder are recommended preventive measures.[29,30]

Clinical Implications

Although rare, intravesical mesh migration should be considered in patients with persistent urinary symptoms and a history of hernia repair. Early diagnosis enables timely surgical intervention and prevents complications

such as fistula formation, chronic infection, and bladder damage.[31–35]

CONCLUSION

Delayed erosion of hernia mesh into the urinary bladder is an uncommon but serious long-term complication of inguinal hernia repair. Because clinical manifestations are often nonspecific, diagnosis requires a high index of suspicion, particularly in patients with persistent urinary symptoms and prior mesh implantation. Imaging and cystoscopy are essential diagnostic tools, and surgical removal remains the definitive treatment. Greater awareness of this complication can facilitate earlier diagnosis and improve patient outcomes.

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