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Vesical calculus formation on non-absorbable sutures used for open inguinal hernia repair



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ABSTRACT

INTRODUCTION: Iatrogenic injuries to the urogenital tract are rare, with the bladder being the organ most affected. We describe a case of a vesical calculus that formed on non-absorbable sutures that were used to repair an inguinal hernia.

PRESENTATION OF CASE: A 45-year-old male presented with frank haematuria and dysuria 2 years following an open left inguinal hernia repair. A CT urography showed a vesical calculus adherent to the left antero-lateral wall of the bladder. Cystoscopy revealed that the calculus formed on non-absorbable sutures. Cystolapaxy was performed followed by cystoscopic excision of the sutures. The patient's post-operative course was uneventful.

DISCUSSION: Foreign bodies in the urinary bladder always act as a nidus for formation of a calculus. Iatrogenic bladder injuries are common during hernia repair. It is however rare for sutures used to repair an inguinal hernia to involve the urinary bladder wall. The patient most likely had a full bladder at the time of hernia repair or the bladder was part of the contents of the hernia sac.

CONCLUSION: This case illustrates the need to ensure that the bladder is empty prior to pelvic surgery and for surgeons to have a good understanding of inguinal anatomy to avoid injuring the contents of the hernia sac.

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1. Introduction

Iatrogenic bladder injuries (IBT) are the commonest among urogenital tract injuries.¹ IBT can be broadly divided into external and internal bladder injuries. The former type is associated with pelvic procedures and mostly occurs during obstetric and gynaecologic procedures, followed by general surgical and urologic interventions.^{1–3}

Internal bladder injuries mainly occur during cystoscopic procedures, namely transurethral resection of bladder tumours (TURBT) where bladder wall perforations can occur. There are two types of bladder wall perforations, intra- and extra-peritoneal, with the

former being more common and requiring intervention.¹ Iatrogenic foreign bodies inside the bladder can be caused by dislodgment or breaking of the intra-vesical instruments, forgotten surgical gauze, non absorbable sutures, or staples used in pelvic procedures. In addition, unrecognised perforations can occur due to erosion of urinary incontinence meshes.⁴ We present the case of an unrecognised iatrogenic transvesical sutures into the bladder wall during an open left inguinal hernia (LIH) repair.

2. Case report

A 45-year-old male presented with a 1 year history of intermittent macroscopic haematuria associated with dysuria. The patient had no significant past medical history apart from a LIH repair 2 years prior to presentation. The hernia repair was carried out in a developing country. He is a smoker of 20 pack years.

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Fig. 1. CT scan of the abdomen and pelvis showing a calculus (black arrow) on the antero-lateral wall of the urinary bladder.

The only abnormality on physical examination was bilateral inguinal hernias. Urine microscopy showed RBC, but no bacterial growth.

Urine cytology was negative. He had a normal urinary flow rate. Haematological and biochemical profiles were grossly normal. CT urography showed bilateral inguinal hernias and multiple bladder stones with the largest measuring 7 mm as shown in Fig. 1.

Cystoscopy revealed multiple vesical calculi which were adherent to the left antero-lateral wall of the bladder. The calculi were fragmented using Laser. During laser lithotripsy, it was noted that the calculi were attached to 3 prolene sutures that were used for the LIH hernia repair (Fig. 2). Cystoscopic scissors were used to cut the sutures and release them off the bladder wall, followed by forceps extraction of the excised sutures. Patient's postoperative course was uneventful. Upon discharge, the patient was referred to a General Surgeon for repair of RIH and repair of recurrent LIH.

3. Discussion

As reported in the literature, the presence of foreign bodies in the bladder is rare with only a very few small case series reporting

both self-introduced and iatrogenic introduction of foreign bodies into the bladder. Iatrogenic bladder injuries following hernia repairs have also been reported in the literature in the paediatric population following open herniorrhaphy procedures.^{5,6} Furthermore, since the advent of laparoscopic hernia repairs there has been a growing trend of reports of bladder injuries. These injuries are divided into direct injuries to the bladder wall in the form of lacerations, thermal injuries, surgical clips, or indirect in the form of mesh migration or migration of intrauterine contraceptive devices (IUCDS).⁷ The literature reports that direct injuries are usually recognised intra-operatively and the latter tends to have a delayed presentation, mimicking bladder neoplasms in some instances.^{1,8} To the best of our knowledge this may be the first case report on vesical stones secondary to the presence of prolene sutures in the bladder wall following open inguinal hernia repair. There have been reports of bladder stones secondary to sutures and vaginal tapes in the bladder.^{4,9,10} For example, the use of non-absorbable sutures in closing the bladder or in performing ureteroneocystostomy almost always invariably leads to vesical calculus formation on such non absorbable sutures.¹⁰ There are also reports where following orthopaedic pelvic surgery and in some

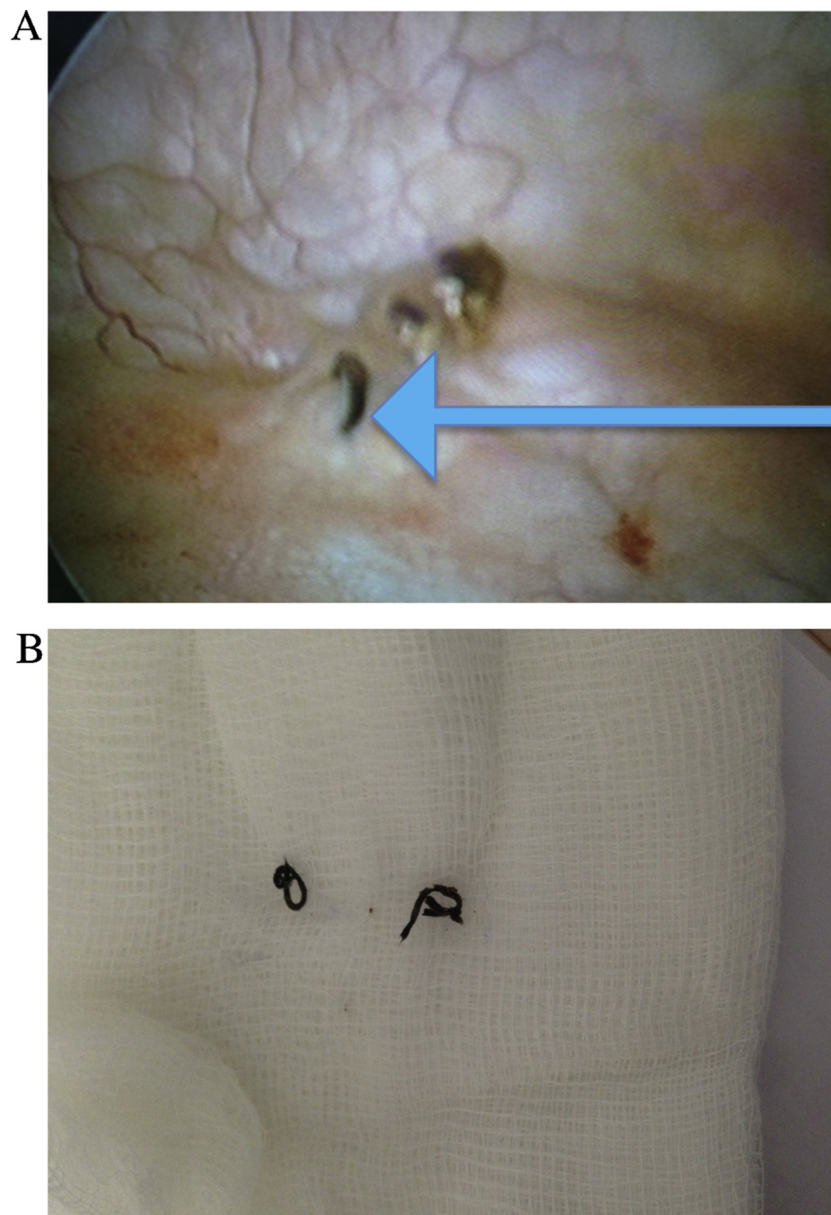


Fig. 2. (A) Cystoscopic view of the non-absorbable sutures in the bladder following stone fragmentation. (B) The sutures following excision.

instances open bladder surgery foreign non absorbable materials eroded into the bladder and caused vesical calculus.^{11,12}

In our case, the presence of prolene stitches in the bladder wall created a nidus for stone formation. Several techniques have been described in the literature on the management of foreign bodies in the bladder but none reported the treatment of prolene sutures. However, the use of endoscopic scissors to release urethral slings that protruded into the bladder has been reported and proved successful as in our case. It is important for the operating surgeon to have a good understanding of inguinal anatomy and carry out a thorough inspection of the contents of the defect while

performing a hernia repair. In our patient, we suspect that the injury occurred when the posterior wall plication was performed. The injury occurred most likely due to deep stitches which included the wall of the bladder or the patient had the LIH repair while his bladder was full. Therefore, it is important to ensure that the bladder is emptied prior to performing open hernia repairs and the hernia sac contents are thoroughly examined prior to planning the repair. Finally, it is worth remembering that some hernia sacs contain not just omentum or loops of small bowel, but occasionally the urinary bladder and in rare instances the ascending or sigmoid colon as shown in Fig. 3.



Fig. 3. (A) A sagittal section of the CT of the pelvis in a patient with a left inguinal hernia sac containing the sigmoid colon and part of the urinary bladder. (B) A coronal section of the CT of the pelvis in a patient with a left inguinal hernia sac containing the sigmoid colon and part of the urinary bladder.

4. Conclusions

We present a very rare case of bladder stones secondary to an iatrogenic injury to the bladder in the form of prolene stitches protruding into the bladder following an open inguinal hernia repair. A thorough understanding of inguinal anatomy and examination

of the defect and hernia sac contents are vital to avoid this type of injuries. Emptying the bladder pre-operatively by patients prior to going to the theatre for inguinal hernia repair will also prevent this type of complication. The use of cystoscopic scissors for the release of sutures in the bladder is a safe and effective technique in the management of foreign bodies in the bladder.

Conflict of interest

There is no conflict of interest by any of the authors.

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Ethical approval

Formal approval for the study was not obtained from ethics committee as the study did not change the treatment plan of

the patients based on inclusion in this study. However, in carrying out the study, the principles of the Helsinki Declaration were followed.

Author contributions

Ahmad Almarzouq was involved in writing the paper and data collection. Akram H. Mahmoud was involved in operating surgeon and data interpretation. Samuel D. Ashebu was involved in collection and analysis of radiological images. Elijah O. Kehinde was involved in study design, editing the paper and consultant urological surgeon in charge.

Key learning points

- Foreign bodies in the urinary bladder always act as a nidus for formation of a calculus.
- This was a rare case of bladder stones secondary to an iatrogenic injury to the bladder in the form of prolene stitches used to repair an inguinal hernia protruding into the bladder.
- The patient most likely had a full bladder at the time of hernia repair or the bladder was part of the contents of the hernia sac.
- This case illustrates the need to ensure that the bladder is empty prior to pelvic surgery and for surgeons to have a good understanding of inguinal anatomy to avoid injuring the contents of the hernia sac.

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

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