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Case Report

Transabdominal Preperitoneal inguinal hernia repair leading to orchiectomy: A case report

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ABSTRACT

Introduction: And importance: The most common postoperative complications after inguinal hernia repair are hernia recurrence, hematoma, seroma, wound infection, chronic pain, numbness and swelling. The aim of this case report is to present a rare complication of inguinal hernia repair, a large scrotal abscess that was caused by an inoculated scrotal hematoma 3 months after Transabdominal Preperitoneal bilateral inguinal hernia repair.
Case presentation: An 84-year-old patient presented to the emergency department complaining about fever, pain and progressive swelling of the left hemiscrotum. He had undergone a Transabdominal Preperitoneal bilateral inguinal hernia repair 3 months earlier and a scrotal paracentesis 17 days earlier due to a scrotal hematoma. The pelvic CT scan was indicative of a large abscess in the left hemiscrotum compressing the ipsilateral testicle. Surgical exploration of the inguinal area was performed and considering the patient's advanced age the abscess was excised "en bloc" with the ischemic ipsilateral testicle. The patient had an uneventful recovery and was discharged home on the third postoperative day.
Clinical discussion: Scrotal abscess, although rare, should be considered in the differential diagnosis of scrotal pain after inguinal hernioplasty. Scrotal drainage is sometimes used in order to relive the patient's discomfort caused by a swollen scrotum, but if not performed properly it can lead to serious infections. Postoperatively, a suction drain or elevation and compression of the scrotum may prevent scrotal complications.
Conclusion: Scrotal abscess is a rare complication of inguinal hernioplasty. Scrotal care pathways establishment after inguinal hernia repair could help reduce and manage complications.

1. Introduction

Inguinal hernia repair is one of the most common surgical operations performed worldwide. Bassini was the first to propose an efficient technique introducing the concept of reconstructing the inguinal canal floor, in 1887 [1]. Since then, many modifications were suggested. Almost 100 years later in 1986, Lichtenstein presented a breakthrough in the repair of inguinal hernia, the tension-free repair by using a mesh [2]. A monofilament knitted polypropylene – Marlex mesh was first used in the repair of inguinal and incisional hernia by Usher and his colleagues in 1958 [3]. The main weakness of non-mesh techniques is its high recurrence rate about 4.4–17%, contrary to the Lichtenstein technique with recurrence rates of 1-1,4 [4]. Currently, three methods are scientifically certified and can be recommended for clinical application: 1) the Shouldice technique, a form of suture repair, 2) the Lichtenstein technique, 3) Laparoscopic/endoscopic posterior flat mesh repair, namely Transabdominal Preperitoneal (TAPP) and Totally Extraperitoneal repair (TEP) [4].

Various postoperative complications have been recorded after inguinal hernia repair. The most common are hernia recurrence, hematoma, seroma, wound infection, chronic pain, numbness and swelling [5,6]. Due to the anatomy of the region, urological complications, such as acute urinary retention, scrotal hematoma, hydrocele, orchialgia and lower urinary tract symptoms are often being noticed [7]. The frequency of these outcomes varies between the available operative techniques. Lichtenstein technique seems to have a higher overall complication rate as compared with TAPP (23,3% against 6,7%, respectively), with higher pain scores and wound infections, seroma, urinary retention and genital

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or scrotal numbness being more common [5,8]. Regarding endoscopic procedures, TAPP and TEP have similar complication rates but TEP is more complex and requires an expert surgeon [9]. With the advent of meshes in inguinal hernia surgery, more rare complications, such as the formation of a scrotal abscess due to sigmoid-scrotal fistula, have been reported [10]. In our case, we present another rare complication, what to our knowledge is the first reported case of scrotal abscess ascribed to a scrotal hematoma after TAPP bilateral inguinal hernia repair. This case report has been reported in line with the SCARE Criteria [11].

2. Presentation of case

An 84-year-old male presented to the emergency department complaining about fever (>38 °C), pain and progressive swelling of the left hemiscrotum. He had undergone a Transabdominal Preperitoneal (TAPP) bilateral inguinal hernia repair 3 months before (Fig. 1), a scrotal paracentesis 17 days before due to an edema/hematoma and was under medication with antibiotics (cefixime and azithromycin) for the last fifteen days. The patient reported a medical history of hypertension and benign prostatic hyperplasia and was receiving amlodipine, irbesartan with hydrochlorothiazide and alfuzosin. No allergies or smoking were reported, while he was a social drinker. Vital signs were: heart rate 105 beats/min, blood pressure 100/50 mmHg, respiration 17 breaths/min and body temperature 36,4 °C. Physical examination revealed an enlarged left scrotum sensitive to palpation (Fig. 2) without signs of hernia recurrence and laboratory results were within normal range (white blood cells 7,03 $\times$ 10^3 ml^{-1}). A lung and abdomen X-ray was performed that didn't reveal signs of infection or air-fluid levels. The abdominal and pelvic CT scan revealed a fluid collection in the left hemiscrotum with septations and a lobed, thickened, enhancing wall, sized 15 $\times$ 11cm with the left testicle compressed underneath (Fig. 3).

Surgical exploration of the inguinal canal with the patient under general anesthesia was decided. During surgery, a large abscess was found in the left hemiscrotum that strangulated the ipsilateral testis. The mesh which was used in the TAPP surgery was placed in the posterior plane and was not in contact with the abscess or inoculated. There were no signs of mesh infection and no recurrence was clinically evident. The abscess was excised "en block" with the testis (Fig. 4) and a redon drain was placed in the scrotum. The operation was performed in a University General Hospital by DP (Associate Professor of General Surgery) who is an experienced surgeon, GT (General Surgery Consultant), AK (General Surgery Consultant) and CK (General Surgery Resident). Postoperatively, the patient was transfused with 2 units of Red Blood Cells and 2 units of Freshly Frozen Plasma, due to decreased levels of hemoglobin and increased INR (Hgb = 8,2 g/dL and INR = 1,48). On the first and second postoperative day he was under intravenous antibiotic therapy with ciprofloxacin, 400mg S: 1 $\times$ 3, and metronidazole, 500mg S: 1 $\times$ 3, which was changed to oral sultamicillin, 375mg S: 1 $\times$ 2, on the third postoperative day. The postoperative pain was controlled with the administration of 1g paracetamol S: 1 $\times$ 4 and 8 mg lornoxicam S: 1 $\times$ 2, whilst the medication he was receiving at home for his chronic diseases was continued during his hospital stay. On the first postoperative day the drain was removed and on the third day he was discharged home. The administration of sultamicillin, 375mg S: 1 $\times$ 2, for a week deemed necessary and the follow-up, fifteen days later, revealed no complications. The patient realized that the abscess formation was a rare complication of the inguinal hernia operation and the excision of his testicle "en block" with the abscess was the best option. Three months after the operation, his follow up revealed an uneventful recovery with no complications.

Fig. 1. Abdominal X-ray: the radiopaque tackers used for the mesh fixation (arrows).

Fig. 2. Clinical presentation of the patient' s scrotum in the Emergency Department.

3. Clinical Discussion

Inguinal hernia is the most common type of hernia dealt by general surgeons. After Bassini presented his technique many modifications have been proposed [1]. Shouldice technique is the most commonly used today that doesn't include the application of a mesh. However, methods involving a mesh, such as the Lichtenstein and

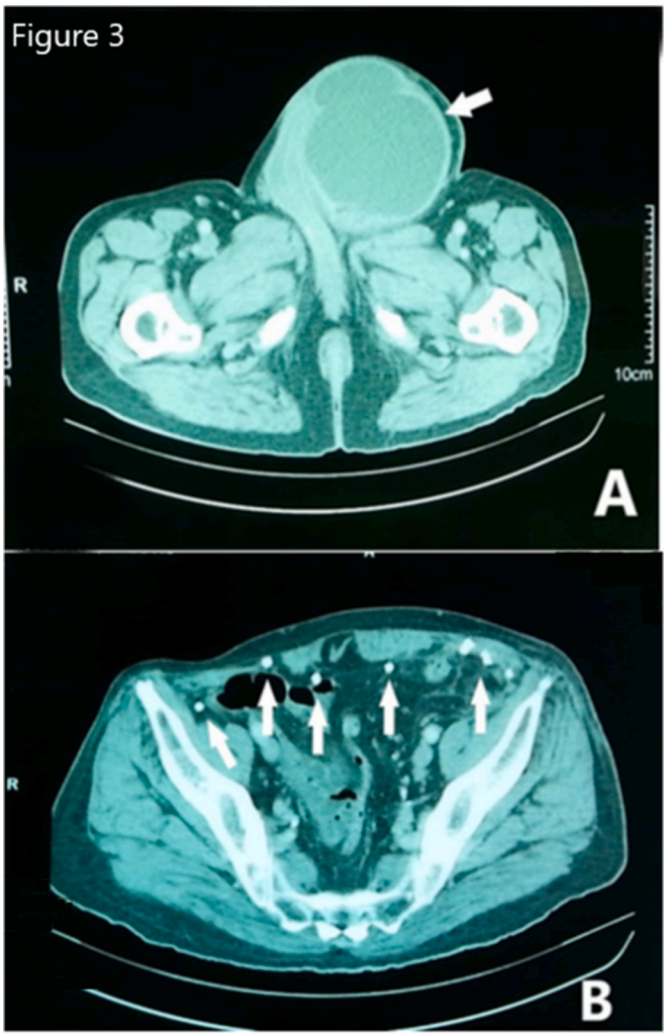

Fig. 3. Abdomen and pelvic CT scan showing: A) a large abscess on the left hemiscrotum (arrow) B) the tackers used for the mesh fixation of the bilateral inguinal hernia (arrows).

laparoscopic/endoscopic procedures, seem to have a lower recurrence rate and are the best evidence-based options for most cases of inguinal hernia [12].

Regarding primary bilateral inguinal hernia such as in our case, endoscopic procedures have the benefit of repairing two hernias from the same three keyhole incisions. As a consequence of that, TAPP and TEP lead to less operative time, pain and faster recovery and are recommended for bilateral hernia [12].

Despite inguinal hernia being a widely performed operation, it doesn't lack complications. More frequently encountered are seromas and hematomas [5]. Even though they are self-limited, in most cases, may cause extensive discomfort and anxiety to the patient. They can also lead to a surgical site infection as they are a good media for inoculated bacteria growth. Significant preoperative risk factors identified for hematoma formation are warfarin usage, valvular heart disease, atrial fibrillation, hypertension, recurrent hernia and coronary artery disease [13]. Our patient reported a medical history of hypertension leading to a higher risk of scrotal hematoma.

The most usual causes of scrotal pain are testicular torsion, epididymitis, post-vasectomy pain, varicocele and chronic orchialgia [14]. Scrotal abscess or pyocele is a rare condition contrary to other inflammatory testicular conditions like epididymitis and orchitis [15]. More frequently it is a complication of epididymo-orchitis whilst it is a quite rare complication of inguinal hernia repair. The clinical presentation of

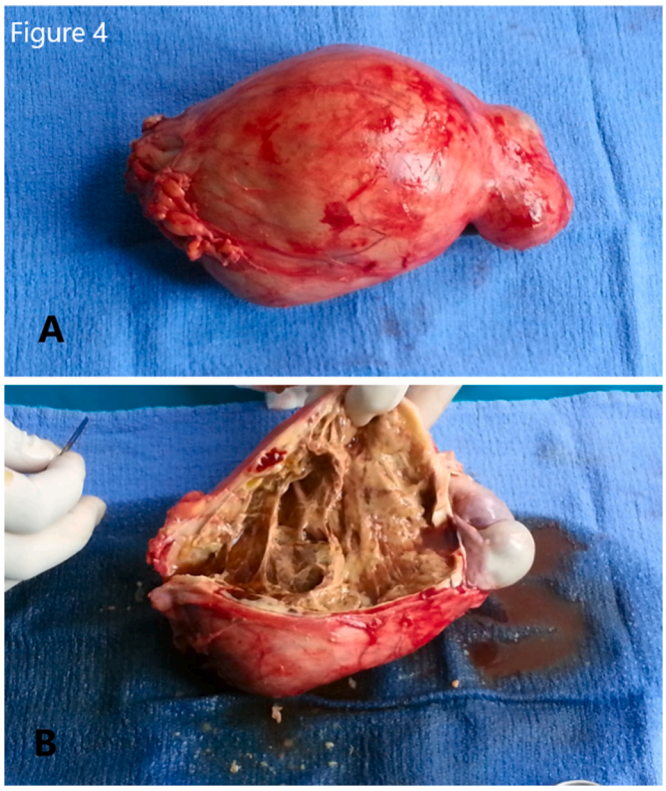

Fig. 4. A) The abscess removed en bloc with the testicle.
B) The pus and septations inside the testis.

a scrotal abscess is an extremely painful and swollen scrotum frequently along with fever and raised white blood cells [16]. In cases of no treatment, it can lead to Fournier gangrene, a necrotizing fasciitis of the perineum which can prove lethal sometimes [17]. Conditions that increase the hazard of leading to Fournier gangrene are diabetes mellitus, ethanol abuse, local trauma, paraphimosis, periurethral extravasation of urine, perirectal or perianal infection, and surgery, including circumcision and hernioplasty [18]. In our case, the patient did not have the typical clinical presentation of scrotal abscess and a pelvic CT scan was performed to evaluate the cause of the swollen and tender scrotum. Moreover, he had undergone a hernioplasty increasing the danger of the abscess leading to a necrotizing fasciitis.

There are no scrotal care pathways established after inguinal hernia repair [7]. A closed suction drain can be placed or scrotal elevation and compression can be used to avoid postoperative edema and hematoma [19]. In some cases, centesis of the scrotal wall can also be performed, in order to relieve the patient's discomfort. Although this is a simple procedure, it is very important to preclude an infection by practicing the centesis following a sterile technique [20].

In our case, the patient had undergone a scrotal paracentesis 17 days earlier in order to relieve the edema/hematoma. This procedure inoculated bacteria into the scrotum inducing an infection and leading to the formation of a big scrotal abscess. There are no guidelines for the management of a scrotal abscess secondary to inguinal hernia surgery. The patient presented belatedly when the abscess was enlarged and was strangulating the ipsilateral testis. Already under antibiotics, we opted for a surgical exploration of the inguinal canal which led to excision of the abscess "en bloc" with the ischemic testis, considering the patients' advanced age.

The strength of this case report is that it is the first reported case of a scrotal abscess leading to orchiectomy after laparoscopic inguinal hernia repair. Scrotal abscess, although rare, is an entity that clinicians should have in mind after inguinal hernia repair, because if left untreated it can lead to orchiectomy, or serious infections such as Fournier gangrene. On

the other hand, the limitation of this study is that none novel scrotal care management was used. However, it raises awareness about rare but serious complications following an inguinal hernia repair.

4. Conclusion

Scrotal abscess is a rare complication of inguinal hernia surgery. Although rare, scrotal abscess should be considered in the differential diagnosis of an enlarged scrotum after inguinal hernia repair. This complication could be avoided by implementing proper hemostasis intraoperatively and scrotal drain or elevation and compression post-operatively. Therefore, we point out the danger of infection following a scrotal drainage and the need for using a sterile technique.

Ethical approval

Our case report obtained ethics approval from the ethics committee of our hospital and the patient gave his informed consent to participate.

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No funding was secured for this study.

Author contribution

Charalampos Kefalas wrote the manuscript and collected the data. Eleni Karlafti and Apostolos Zatagias revised the manuscript for grammar and syntax mistakes. Daniel Paramythiotis, Eleni Karlafti and Apostolos Zatagias corrected the manuscript for its scientific basis. Daniel Paramythiotis, Anestis Karakatsanis, Georgios Tsakiris and Charalampos Kefalas were the operating surgeons. Antonios Michalopoulos was the director of the Department of Surgery and the consultant surgeon who provided the case. All authors have read and approved the final manuscript.

Consent

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

Guarantor

Daniel Paramythiotis accepts full responsibility for the work and the conduct of the study, had access to the data, and controlled the decision to publish.

Provenance and peer review

Not commissioned, externally peer-reviewed.

Availability of data and materials

The data and materials/figures used in the current study are available from the corresponding author on reasonable request.

Research registration

None declared.

Declaration of competing interest

Authors of this article have no conflict or competing interests that could have influenced the work reported on this paper.

Appendix A. Supplementary data

Supplementary data to this article can be found online at https://doi.org/10.1016/j.amsu.2022.104288.

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