Inflammation and infection

A challenging case of surgical management of a single ischemic testicle from severe epididymo-orchitis

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ABSTRACT

A 41 years-old male patient presented acutely with severe right testicular pain, and fever for 48 hours. Patient had a background of previous left orchidectomy for epididymo-orchitis and sexually-transmitted disease. A clinical diagnosis of right epididymo-orchitis was made and patient was treated with intravenous broad-spectrum antibiotic. However subsequent ultrasound revealed imminent testicular ischaemia. Given the challenging nature of the case, i.e. single testicle with testicular ischaemia, surgical exploration, fasciotomy and tunica vaginalis grafting was performed to the patient. The patient recovered fully post-operatively with ultrasound proving restoration of end-diastolic flow to the testicle.

Introduction

Epididymo-orchitis is a common urological condition, usually manageable with supportive and antibiotic treatments. However, severe epididymo-orchitis can lead to testicular ischaemia due to tissue inflammation and edema.\textsuperscript{1} This case report presents a challenging but successful case with operative management for severe epididymo-orchitis with imminent ischaemia, in the context of high-risk profiles, including single testicle and deteriorating sepsis.

Case history

A 41 years-old male patient presented to emergency department with severe right testicular pain, and fever for 48 hours. The patient had a background of previous left orchidectomy for left epididymo-orchitis from sexually-transmitted disease. The patient did not have diabetes, obesity or endocrine disorders. The patient was not immunosuppressed and did not take any regular medications. Social history includes a 50 pack-year smoking history, occasional alcohol consumption, as well as participating in polyamorous relationships with female partners.

On examination, the patient was tachycardic (120/min), hypotensive (100/60 mmHg), and febrile to 39\textdegree Celsius. Thorough examinations of his abdomen, cardiovascular and respiratory systems were unremarkable.

A focused examination of the patient’s scrotum revealed a single right testicle, grossly swollen, significantly tender and markedly indurated. There was no evidence of skin cellulitis or fourniers.

On investigation, patient had acutely elevated white cell count of 23 $\times$ 10\textsuperscript{9}/L, C-reactive protein of 120 mg/L and an elevation of his creatinine level at 150 $\mu$mol/L, indicating acute kidney injury. Blood culture and urine culture were taken.

A clinical diagnosis of right epididymo-orchitis, with septic shock was made. Immediately in emergency department, the patient was resuscitated with intravenous fluid and supplemental oxygen. Intravenous broad-spectrum antibiotic of Tazocin (4.5g three times daily) was given.

Patient subsequently had an ultrasound revealing sluggish arterial flow with absence of end-diastolic blood flow (Fig. 1). This was a sign of imminent testicular ischaemia.\textsuperscript{2}

This patient underwent urgent scrotal exploration. The tunica albuginea was incised open, releasing the high compartment pressure compressing the testicle. A graft was harvested from tunica vaginalis and patched over the defect with interrupted absorbable sutures (Fig. 2). Post-operative ultrasound on day one confirmed restoration of end-diastolic blood flow (Fig. 3). The patient was discharged after receiving further 48 hours of intravenous antibiotics. On follow-up review at 1 month, patient had a full recovery without any further complications.
Discussion

Epididymo-orchitis is a common clinical urological disorder. The management is predominantly medical antibiotic therapy and supportive measures, such as analgesia and anti-inflammatory treatments.

Rarely, severe epididymo-orchitis can result in testicular infarction. This is due to a compartment syndrome effect, as a result of tissue edema and inflammation. Similar to the process happened in testicular torsion, venous ischaemia proceeds arterial ischaemia.

If the diagnosis can be made early in its clinical course before irreversible damage to the testicle takes place, and the theory of “compartment syndrome” effect is recognised, then incision of the tunica albuginea can decrease the compartment effect within the testis.

The case represents a challenging but unique opportunity, allowing the authors to successfully salvage the testicle by incising the tunica albuginea, decompressing the compartment pressure within the testis. The decision making process was prompt and swift, i.e. surgical exploration right after the lack of end-diastolic flow was identified, recognising the imminent process of testicular arterial ischaemia. More importantly, this technique should be attempted especially for high risk patients, such as patients with single testicle like in this case.

According to Figueroa et al. (2012), following capsulotomy of the tunica albuginea, tunica vaginalis grafting to cover the defect results in normalisation of the compartment pressure. However literature of this technique is limited, with only one large retrospective study (11 cases

Fig. 1. Ultrasound proved the absence of end-diastolic blood flow with sluggish arterial flow.

Fig. 2. End-diastolic flow was well demonstrated post-operatively.
of vaginalis grafting) revealed that testicular fasciotomy and tunica vaginalis grafting is a rare but novel and effective technique in restoring testicular blood flow (rate of salvage = 55%). In addition, this technique has only been described in managing patient with acute testicular torsion, but not with infective cause of acute testicle.

Therefore this paper reported the first case in the literature of severe epididymo-orchitis with imminent ischaemia, managed successfully by surgical exploration and tunica albuginea incision with tunica vaginalis grafting. This proves that this technique is a safe and effective technique, and should be considered especially in challenging scenarios like this, where salvging the patient’s single testicle should be attempted first before orchidectomy.

Declaration of competing interest

The authors declared no conflict of interest.

References

1. Chin, Wu, Chen, Hsiao. Segmental hemorrhagic infarction of testis associated with epididymitis. J Clin Ultrasound. 1998;26:326–328.
2. Figueroa, Joao, Salle, et al. Comparative analysis of detorsion alone versus detorsion and tunica albugine. Decompression (fasciotomy) with tunica vaginalis flap coverage in the surgical management of prolonged testicular ischemia. J Urol. 2012;188(4):1417–1423.
3. Visser, Heyns. Testicular function after torsion of the spermatic cord. BJU Int. 2003;92:200.
4. Kutikov, Casale, White, et al. Testicular compartment syndrome: a new approach to conceptualizing and managing testicular torsion. Urology. 2008;72:786.