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Urology Case Reports

journal homepage: www.elsevier.com/locate/eucr

Testicular compartment syndrome: An unexpected diagnosis in a case of testicular pain

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ARTICLE INFO

Keywords:

Testicular ischemia
Compartment syndrome
Acute cholecystitis
Testicular diseases
Hydrocoele

ABSTRACT

This case discusses the presentation of a surprising diagnosis of testicular compartment syndrome in a patient with severe testicular pain and swelling in the Emergency Department.

1. Introduction

Compartment syndrome is a topic frequently discussed in Emergency Medicine, in a myriad of clinical situations regarding extremities, eyes, the chest, and abdomen. This case, however rare the diagnosis might be, serves as a reminder of the 5 P's of compartment syndrome: pain, paresthesia, pallor, paralysis, pulselessness. These hallmark symptoms of compartment syndrome must be kept in mind when dealing with testicular pain and swelling.¹ Compartment syndrome is defined by an increase in compartment pressure that restricts to local tissue perfusion by a reduction in the arteriovenous pressure gradient. Pain is the earliest finding of acute compartment syndrome and is described as out of proportion to physical exam findings. While it is not within the scope of Emergency Medicine to check the compartment pressure of a testicle or to perform a fasciotomy in this scenario, this case serves as a reminder to consider the diagnosis of compartment syndrome in cases of pain out proportion to exam.

Testicular compartment syndrome involves compromised perfusion of the microvasculature of the testicular tissue due to compression.² This particular case highlights a complication of epididymo-orchitis, a diagnosis that is often treated on an outpatient basis.

2. Case presentation

A 28 year old Hispanic man presented to the Emergency Department

(ED) with the chief complaint of subjective fever for a week with progressive worsening of symptoms. Additionally, he was experiencing progressive pain and swelling of his left testicle that began eight days prior. The testicular pain radiated to his left flank and abdominal left lower quadrant. He denied nausea, vomiting, diarrhea, constipation, dysuria, hematuria, penile discharge, pain, swelling, or external lesions to the genitalia. He did endorse some recent blood in his ejaculate and intermittent chills. He denied past medical history except removal of anal polyps many years ago. He denied smoking, alcohol, or recreational drug use. He was sexually active with one male partner for five years. They are monogamous and do not use barrier protection with intercourse. He denied any history of sexually transmitted infections. Additionally, the patient endorsed an unintentional 10 pound weight loss over the past month with generalized weakness and fatigue.

From triage, the patient was "sepsis alerted" based on his vital signs: pulse 135bpm, BP 119/71 mmHg, RR 18 breaths/min, T 101.8 °F, 98% O₂ saturation on room air. He was immediately started on intravenous (IV) fluids and empiric IV antibiotics. Acetaminophen was given for fever. Ketorolac was given for pain.

Physical exam of the patient revealed a very uncomfortable, ill-appearing young man in moderate distress with diffusely tender and swollen left testicle and induration and mild overlying scrotal erythema. No fluctuance or crepitus was noted. No other skin changes to external genitalia or perineum were present. Cremasteric reflexes were equivocal bilaterally. The abdomen was soft, nontender, nondistended. There was

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<https://doi.org/10.1016/j.eucr.2021.101823>

Received 26 March 2021; Received in revised form 22 August 2021; Accepted 23 August 2021

Available online 23 August 2021

2214-4420/© 2021 The Author(s).

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left flank pain to palpation. Rectal exam was limited due to patient retracting, but patient did not appear to have tenderness to palpation of prostate.

Laboratory analysis revealed a normal complete blood count, electrolytes and creatinine. The procalcitonin and lactic acid were elevated at 0.15 ng/ml and 2.86 mmol/L respectively. Scrotal ultrasonography revealed a grossly enlarged L testicle measuring with increased vascular flow to the L epididymis (Figs. 1 and 2). CT scan of the pelvis revealed a large hydrocele (Fig. 3).

The patient consented to a rapid HIV test, which was positive.

Urology evaluated the patient in the ED and stated he was concerned the left testicle was “about to explode.” For the next two days in the hospital, patient remained febrile and tachycardic, but with improving testicular pain. On day 3 of hospitalization, patient was taken to the operating room (OR) for scrotal exploration and drainage. Operative findings included an atrophic right testicle, hyperemic left testicle and epididymis. The tunica vaginalis was constricting the blood flow to the left testicle. Part of the tunica vaginalis was excised as a “fasciotomy” for compartment syndrome of the left testicle. Bilateral orchiopepy was performed. Patient was discharged on post-op day #5 with oral antibiotics for ten days and follow up with both ID and urology in 10–14 days.

The patient returned to our ED 9 days later with acute cholecystitis and underwent cholecystectomy. Genitourinary exam revealed improving scrotal swelling but with purulent drainage from scrotal incision. Urology followed patient daily with scrotal incision exploration and packing. On cholecystectomy POD#2, necrotic subcutaneous tissue was found during scrotal exploration. Patient was taken back to the OR. Intraoperative findings revealed infarcted testes due to infection secondary to the bilateral orchietomy.

3. Discussion

Testicular compartment syndrome can occur secondary to orchitis, hydrocele, varicocele, scrotal hernia, and cryptorchism. As testicular tissue expands and the microcirculation is constricted, the tunica albuginea opposes those forces due to its decreased compliance for expansion compared to the surrounding tissue. This process is followed by ongoing inflammation and edema within the tissues.

Discomfort, pain, and lack of blood flow are all possible signs of testicular compartment syndrome, but accumulation of fluid around the testicles, which causes inflammation and enlargement in the scrotum, can also denote the condition — otherwise known as a hydrocele. Hydroceles can be formed by various mechanisms, including serous fluid secretion, insufficient re-absorption of the mesothelium fluid, and a deficiency of efferent lymphatics.¹ They can be treated surgically and non-surgically by Jaboulet and Lord’s procedures or by aspiration and sclerotherapy, respectively.

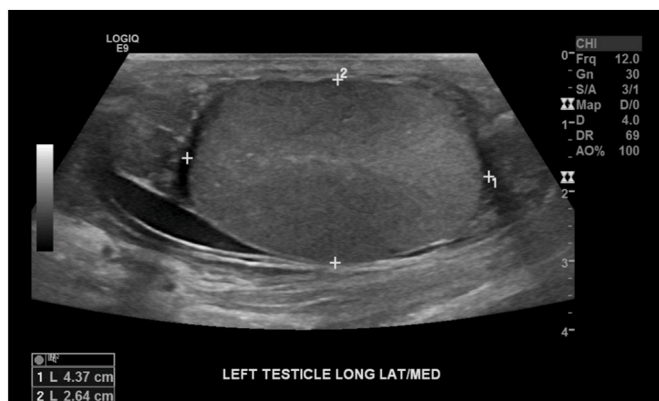


Fig. 1. Noncolor flow ultrasound image demonstrating grossly enlarged L testicle measuring 4.4 x 2.9 x 2.6 cm (white crosshatches).

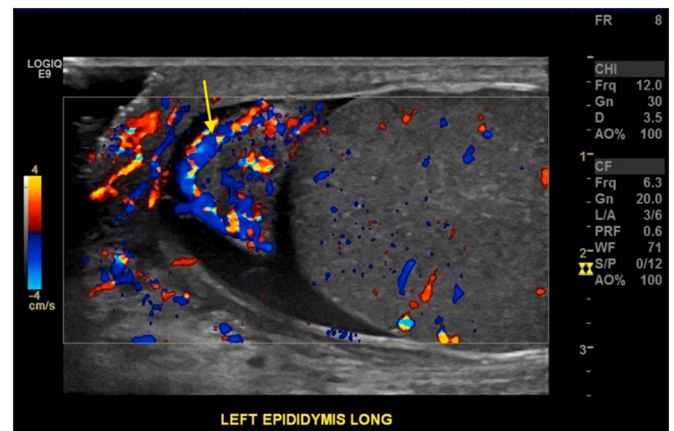


Fig. 2. Doppler ultrasound image demonstrating Increased vascular flow to the L epididymis (arrow).

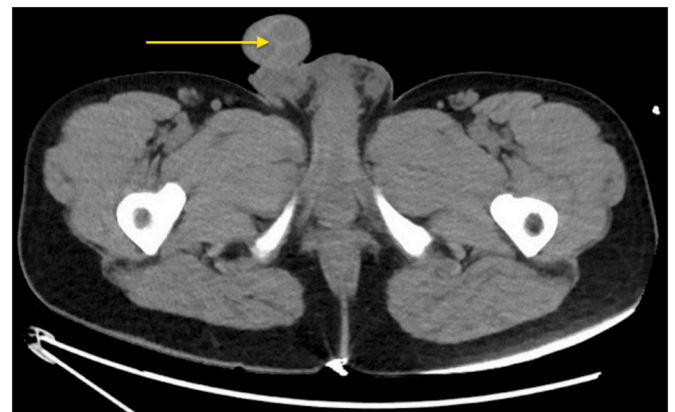


Fig. 3. Non contrast CT scan of the pelvis demonstrating a large left testicle with hydrocele (arrow).

Consequences of Testicular Compartment Syndrome (TCS) include defective testicular endocrine function and spermatogenesis, so it is crucial to provide patients with swift and appropriate care. Treatment should be based off of etiology and the severity of the case. Physicians can utilize power Doppler US to monitor for early signs of TCS and to prevent the maximal ramifications of IRI, a phenomenon where ischemia-induced changes are worsened subsequent to reperfusion. IRI and TCS can increase oxidant levels, so antioxidants, such as superoxide dismutase, glutathione reductase, vitamin C, vitamin E, thioredoxin reductase, melatonin, and allopurinol, can be employed to inhibit oxidant release, retrieve released oxidants, and amend oxidant damage.²

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.

Author contributions

ED and CP saw the patient in the Emergency Department. ED, CP, BK and LG conducted literature review, and prepared the manuscript. All authors approved the final version of the manuscript.

Disclaimer

This research was supported (in whole or in part) by HCA Healthcare and/or an HCA Healthcare affiliated entity. The views expressed in this publication represent those of the author(s) and do not necessarily represent the official views of HCA Healthcare or any of its affiliated entities.

Declaration of competing interest

None of the authors have any conflict of interest.

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