A case of acute vasitis mimicking an incarcerated inguinal hernia with subtle imaging findings

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Acute vasitis, or inflammation of the vas deferens, is a rare condition that classically presents with unilateral groin pain radiating into the scrotum and a bulge or induration along the inguinal canal. As a result, it mimics and is often mistaken for more common pathologies such as inguinal hernia, epididymo-orchitis or testicular torsion. A misdiagnosis may lead to unnecessary surgery and morbidity. Here, we present a case of acute vasitis which was originally diagnosed as an incarcerated inguinal hernia. Finally, we review the imaging findings, which can often be subtle and misinterpreted or missed.

Key Words: vasitis, hernia, computed tomography

Introduction

Acute vasitis is a rare condition with few published cases, and little is known about its pathophysiology or clinical course. It is commonly mistaken for more common pathologies such as inguinal hernia, epididymo-orchitis and testicular torsion.[1-3] Diagnosis is usually made via computed tomography (CT) imaging, but because of the rarity of the condition, even imaging findings may be misinterpreted or missed on initial assessment. This can lead to misdiagnoses, potentially unnecessary procedures or medications causing increased morbidity. Here, we present a case of acute vasitis originally thought to be an incarcerated inguinal hernia. Additionally, we present new imaging findings not previously reported with acute vasitis.

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Case report

A 32-year-old male presented to the emergency department with right inguinal pain worsening over the preceding 2 to 3 days. He reported a sharp pain in his groin exacerbated by prolonged standing and increased intra-abdominal pressure, such as when carrying groceries. The pain radiated into his right hemiscrotum. He denied fevers, chills, painful ejaculation, dysuria or the presence of a bulge in his groin or scrotum. His medical history was notable for human immunodeficiency virus (HIV), but he was compliant with triple antiretroviral therapy and he had a recent CD4 count of 758 cells/µl, indicating well controlled disease. He reported a remote history of sexually transmitted infections including syphilis and chlamydia, both of which had been treated to completion. Finally, he reported a recent history of both receptive and penetrative sexual intercourse with men.

On physical examination, he exhibited tenderness over an indurated right inguinal canal as well as significant tenderness and thickening of the right

Figure 1. Significant edema and thickening of the right inguinal canal.

vas deferens and surrounding cord structures. No increased pain, bulge or defect in the external ring on Valsalva maneuver was observed (as might have been expected in the setting of a hernia). No tenderness of the testicles or epididymis was elicited. The patient presented without vital sign abnormalities and he had a white blood cell count of 7.8 x10^3 cells/µl.

Given the patient's presentation, the working diagnosis was an incarcerated inguinal hernia. General surgery was consulted to confirm the diagnosis and cross-sectional imaging was recommended. A CT was performed and read by the radiologist as induration of the fat within the right inguinal canal with no hernia observed. Subsequently, a scrotal ultrasound was performed, which was negative for epididymitis and testicular torsion. Color doppler was negative for any significant change in the flow pattern to the testicle or epididymis.

The Urology service was consulted for further recommendations. Upon examination of the patient and further review of the CT scan, prominence of the right vas deferens was noted in both the inguinal canal and near the ejaculatory duct, Figures 1 and 2. Additionally, inflammatory changes were noted around the right vas deferens through its course in the inguinal canal. Further review of the imaging with our radiology colleagues demonstrated the prominence of the vas deferens in the inguinal canal extending to its insertion in the prostate. A small amount of fluid in between the seminal vesicles and rectum was also noted, Figure 3. These findings suggested acute vasitis with a local inflammatory ascites collecting posterior to the prostate.

The patient was thus discharged on a 14-day course of levofloxacin in addition to non-steroidal anti-inflammatory drugs (NSAIDs) with a working diagnosis of acute vasitis. Subsequent urine culture was negative. At 6-week follow up, the patient reported complete resolution of his symptoms. While he continued to have mild residual induration of his vas deferens at this visit, his tenderness had completely resolved.

Discussion

Vasitis is a rare condition commonly divided into two categories based on the duration of symptoms: chronic and acute. Generally, acute inflammation of the vas deferens is infectious in nature. Conversely, chronic cases, such as with chronic vasitis nodosa, most

Figure 2. Ascites between the prostate and rectum, thought to be secondary to inflammation (arrow).

Figure 3. Thickening of the vas deferens with surrounding inflammatory changes and edema (arrow).

commonly occur following vasectomy as a result of iatrogenic blockage of the vas deferens and subsequent inflammatory reaction secondary to regeneration of the vas deferens epithelial lining. While chronic vasitis most commonly presents as an asymptomatic nodule, acute infectious vasitis usually presents with a groin mass or induration and pain which can radiate into the scrotum.[3] It may be differentiated from similar, yet subtly different pathologies such as epididymitis, orchitis or funiculitis by the lack of findings associated with these conditions, including hyperemia on ultrasound and thickening of the testicle, epididymis or spermatic cord. Clinically, these pathologies manifest similarly, with urinary symptoms and localized pain in the inguinal canal and spermatic cord structures, making the specific diagnosis difficult, Table 1.

Acute vasitis is most commonly caused by retrograde spread of urinary tract pathogens, although urine cultures are often negative.[1,3,4] Though under 50 cases have been reported in the literature, it is thought to be associated with HIV infection, prior procedures on the groin or genitourinary tract and smoking. It has been reported in both pediatric populations and adults of a wide age range.[5,6] No documented association exists between vasitis and men who have sex with men, but given the association of acute vasitis with HIV, the pathology may hold some transitive association with this population, where a higher incidence of HIV is reported.[7] The treatment of acute vasitis is therapy with antibiotics and NSAIDs.[3,4] There is little in the literature on treatment type and duration. Therapy with 2 weeks of oral antibiotics has been the most commonly reported treatment course, although in more symptomatic or severe cases, admission and intravenous antibiotics may be considered.[1,2] Our patient had complete resolution of his symptoms with 2 weeks of oral antibiotics.

While several associations with acute vasitis exist, the exact pathophysiology and physiologic factors leading to inflammation are less understood. It has been suggested that urethra-ejaculatory duct reflux secondary to anatomic variations in the ductus deferens and its insertion into the prostate may predispose some pediatric populations to acute vasitis. The vas deferens usually enters the prostate at an acute angle, which aids in preventing reflux along the ejaculatory system. However, in those with primary acute vasitis, urine may more easily reflux into the ductus deferens.[5] In these cases, we hypothesize that acute vasitis may in fact be a precursor to epididymo-orchitis—analogous to ascending urinary tract infections and pyelonephritis. This is supported by data showing concomitant vasitis and epididymo-orchitis in some patients on ultrasound.[8] Based on the acute vasitis' associations with smoking and prior procedures, we hypothesize that anatomic variations, prior injury to the vas deferens and poor circulation may predispose to inflammation of the vas deferens and increased risk of acute or chronic inflammation.

TABLE 1. **Characteristics of acute vasitis**

Suspected mechanism	• Ascending infection due to reflux of urine into vas deferens • Possible precursor to epididymo-orchitis by anatomic variations, injury to vas deferens or poor circulation
Risk factors	• HIV or immunosuppression • Prior genitourinary procedure procedure • Smoking
Signs and symptoms	• Inguinal pain with radiation to scrotum • Indurated and tender inguinal canal • Nontender testicle or epididymis
Findings	• Cross sectional imaging with inflammation around vas deferens without hernia • Palpable bulge • Often negative urine cultures
Preferred imaging	• CT imaging for isolated acute vasitis • Ultrasound when concomitant epididymitis present
Treatment	• 2 weeks of antibiotics (fluoroquinolones/trimethoprim-sulfamethoxazole/amoxicillin +/- clavulanate) • NSAIDs • Scrotal elevation and support

Because acute vasitis is commonly mistaken for other pathologies, imaging studies are often used to narrow the differential diagnosis.[2] However, there are only a few case reports demonstrating relatively specific imaging findings. CT may reveal thickening and edema of the vas deferens, extending anywhere between the scrotum and its attachment to the ejaculatory duct in the pelvis. In our reported case, cross sectional imaging also demonstrated fluid between the seminal vesicles and rectum, which has not been reported in the literature before but is thought to represent ascites secondary to local inflammation and infection of the distal vas deferens. These findings, in the setting of physical examination and cross-sectional imaging negative for an inguinal hernia, should prompt the medical provider to consider the diagnosis of acute vasitis.

Because many of these patients often present with groin and testicular pain concerning for testicular torsion, scrotal ultrasounds are commonly ordered to aid in the diagnosis; however, these studies may be of limited utility. In a retrospective review of 12 cases, scrotal ultrasound diagnosed acute vasitis in cases where acute epididymitis was present.[8] However, its ability to diagnose vasitis without overt epididymo-orchitis is questionable and it is less sensitive than CT or magnetic resonance imaging.[2,9] Ultrasound studies may be able to assess for a thickened vas deferens and quantify increased blood flow, or hyperemia, to the vas deferens. However, case reports, including ours, have reported normal blood flow to the epididymis despite a diagnosis of acute vasitis.[9] We further suspect that ultrasound may be less sensitive in detecting inflammation of the vas deferens in the pelvis, as seen in our case.

Despite the unique findings on imaging, the diagnosis of acute vasitis may be missed because of its extremely low incidence, even after cross sectional imaging is performed. We present a case where the initial presentation of vasitis was concerning for an incarcerated inguinal hernia, prompting a CT scan. Even after the image was read, additional tests and consultations were ordered because of the subtle radiologic signs that initially escaped perception. In these cases, vasitis should be in the differential diagnosis in order to prevent incorrect diagnoses, tests or unnecessary procedures. Missed diagnoses have been reported to lead to avoidable surgery in both the pediatric and adult populations.[6,9,10] In these cases, scrotal ultrasound can help rule out other causes of acute scrotum, specifically testicular torsion, but may not be able to diagnose pathophysiology of the vas deferens in isolation.

Conclusion

We report a case of acute vasitis originally presenting with signs and symptoms of an incarcerated inguinal hernia, but with subtle imaging findings that revealed the true diagnosis. Acute vasitis should be included in the differential diagnosis in men of any age who present with groin pain where cross sectional imaging shows thickening and surround edema of the vas deferens. Fluid between the seminal vesicles and prostate should also raise concern for acute infectious vasitis, especially in the clinical context of patients with HIV or prior genitourinary tract instrumentation presenting with symptoms of acute groin pain. Urology consultation and awareness of vasitis when formulating a differential diagnosis may be helpful in this setting to prevent unnecessary diagnostics or procedures. □

References

1. Chen CW, Lee CH, Huang TY, Wang YM. Vasitis: a rare diagnosis mimicking inguinal hernia: a case report. *BMC Urol* 2019;19(1):27.
2. Patel K, Lamb B, Pathak S, Peters J. Vasitis: the need for imaging and clinical acumen. *BMJ Case Rep* 2014;2014:bcr2014206994.
3. Chan PT, Schlegel PN. Inflammatory conditions of the male excurrent ductal system. Part II. *J Androl* 2002;23(4):461-469.
4. Eddy K, Piercy GB, Eddy R. Vasitis: clinical and ultrasound confusion with inguinal hernia clarified by computed tomography. *Can Urol Assoc J* 2011;5(4):E74-E76.
5. Clavijo RI, Rose-Nussbaumer J, Turek PJ. Clinically symptomatic vasitis: clinical correlations in a rare condition. *Syst Biol Reprod Med* 2010;56(6):445-449.
6. Muraoka I, Ohno Y, Kanematsu T, Hayashi T, Satomi A. Acute scrotum caused by vasitis with abscess formation in children with lower urological anomalies. *Urology* 2010;76(1):49-52.
7. Rosenberg ES, Grey JA, Sanchez TH, Sullivan PS. Rates of prevalent HIV infection, prevalent diagnoses, and new diagnoses among men who have sex with men in US states, metropolitan statistical areas, and counties, 2012-2013. *JMIR Public Health Surveill* 2016;2(1):e22.
8. Yang DM, Kim HC, Lee HL, Lim JW, Kim GY. Sonographic findings of acute vasitis. *J Ultrasound Med* 2010;29(12):1711-1715.
9. Eddy K, Connell D, Goodacre B, Eddy R. Imaging findings prevent unnecessary surgery in vasitis: an under-reported condition mimicking inguinal hernia. *Clin Radiol* 2011;66(5):475-477.
10. Bissada NK, Redman JF, Finkbeiner AE. Unusual inguinal mass secondary to vasitis. *Urology* 1976;8(5):488-489.