

Spermatic vein thrombosis as a rare cause of testicular pain – review of the literature

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Introduction The authors in this paper discuss a rare disease entity that can cause testicular pain and mimic varicocele.

Material and methods Citing data from a review of the world literature, spermatic cord thrombosis is most often misdiagnosed as an incarcerated inguinal hernia. Patients usually complain of pain and swelling of the testicle, pain in the inguinal region, and sometimes a palpable mass in the inguinal region.

Results Ultrasonography with colour Doppler usually establishes the correct diagnosis. Currently, there are no official recommendations for the treatment of this disease.

There are reports of conservative treatment of spermatic cord thrombosis in the world literature. However, it seems that the gold standard of management remains surgical exploration, which allows us to unequivocally establish the correct diagnosis. In cases of co-morbid thrombosis with spermatic cord varicoelectomy is recommended.

Conclusions Due to the rarity of this disease, the topic of this article was undertaken. The paper reviews the world literature relating to the diagnosis and treatment of this disease entity. Our own algorithm for the management of spermatic cord thrombosis is proposed.

Key Words: testicular pain ◊ thrombosis ◊ spermatic vein ◊ vas deferens ◊ varicocele

INTRODUCTION

Testicular pain in urology is among the common reasons for consultation. The most common causes, such as testicular torsion, appendix testicular torsion, epididymo-orchitis, and varicocele of the spermatic cord, should be ruled out first in patients with this complaint.

Once these causes are ruled out, rarer causes of testicular pain should be considered, which include the spermatic cord thrombosis discussed here.

Thrombosis of the spermatic cord is a rare condition that can lead to acute or chronic testicular pain and swelling [1, 2]. The disease can occur at any age. In the literature, the youngest patient with spermatic cord thrombosis was 6 years old and the oldest was 70 years old. To date, about 42 cases of the disease

have been described in the literature. Fifty per cent of the cases involved men under the age of 35 years [3]. In most cases, seminal vein thrombosis affects the left side [4]. In the literature, the disease is also described in children [5, 6]. Occasionally, thrombosis of the seminal vein can cause necrosis of the testis, due to ischemic changes [1, 2]. From the data of a literature review, spontaneous seminal vein thrombosis is most often misdiagnosed as an incarcerated inguinal hernia [1, 2]. This article attempts to discuss the aetiology, causes, and treatment of spermatic cord thrombosis by reviewing the world literature relating to this disease entity.

Aetiology

In a review of the literature, varicocele, intense physical exertion, vigorous sexual intercourse, vascular

endothelial injury, genitourinary tract tumours, and hypercoagulable states are considered predisposing factors for seminal vein thrombosis [1, 7]. The literature describes a case of a soldier who developed bilateral spermatic cord thrombosis as a result of intense exercise. According to these authors, the intra-abdominal pressure that occurs during prolonged and intense exercise reduces blood flow within the gonadal system, predisposing to thrombosis [7].

Other causes of spontaneous seminal vein thrombosis may include autoimmune diseases such as systemic lupus erythematosus (SLE) [8], non-specific inflammatory bowel disease, or sepsis [9, 10].

Data from the world literature report the risk of sudden thrombotic incidents in patients with SLE is more than 4 times higher than in the general population [8], while in patients with non-specific inflammatory bowel disease this risk is up to 16 times higher in inflammatory bowel disease exacerbations compared to the general population [9, 10].

The world literature reports the first case to date of spermatic cord thrombosis secondary to ulcerative colitis, according to the authors of this paper. The case involved a 36-year-old man [11]. However, the association of spontaneous seminal vein thrombosis with ulcerative colitis has not been fully clarified [12].

The use of corticosteroids and previous surgical procedures such as orchidectomy or laparoscopic inguinal hernia repair may also predispose to seminal vein thrombosis [13].

The neoplastic process also predisposes to seminal vein thrombosis [3].

In the era of the COVID-19 pandemic, a case of a 70-year-old patient diagnosed with testicular vein thrombosis secondary to COVID-19 infection was reported in the world literature. This man complained of left testicular pain and swelling and pain on the left side of the groin. In this patient, the diagnosis of testicular vein thrombosis was confirmed by ultrasonography using Doppler techniques [3]. The association of COVID-19 infection with increased thromboembolic incidents is now well known and has been proven by many publications on the subject. Therefore, COVID-19 infection could be considered as another predictive factor for spermatic cord thrombosis

Symptoms

Patients with spermatic cord thrombosis usually complain of testicular pain [2, 3, 15] or groin pain [2, 3, 16]. Sometimes this disease entity mimics symptoms of acute scrotum including testicular torsion [11] or epididymo-orchitis [3].

Diagnosis

On physical examination, a painful, swollen spermatic cord can usually be palpated in patients with this condition [14, 15].

Ultrasound with colour Doppler plays a critical role in the diagnosis of spermatic cord thrombosis and usually allows the diagnosis of this disease entity [14, 15]. In their practice, the authors encountered a case of a 65-year-old patient with varicocele, in whom

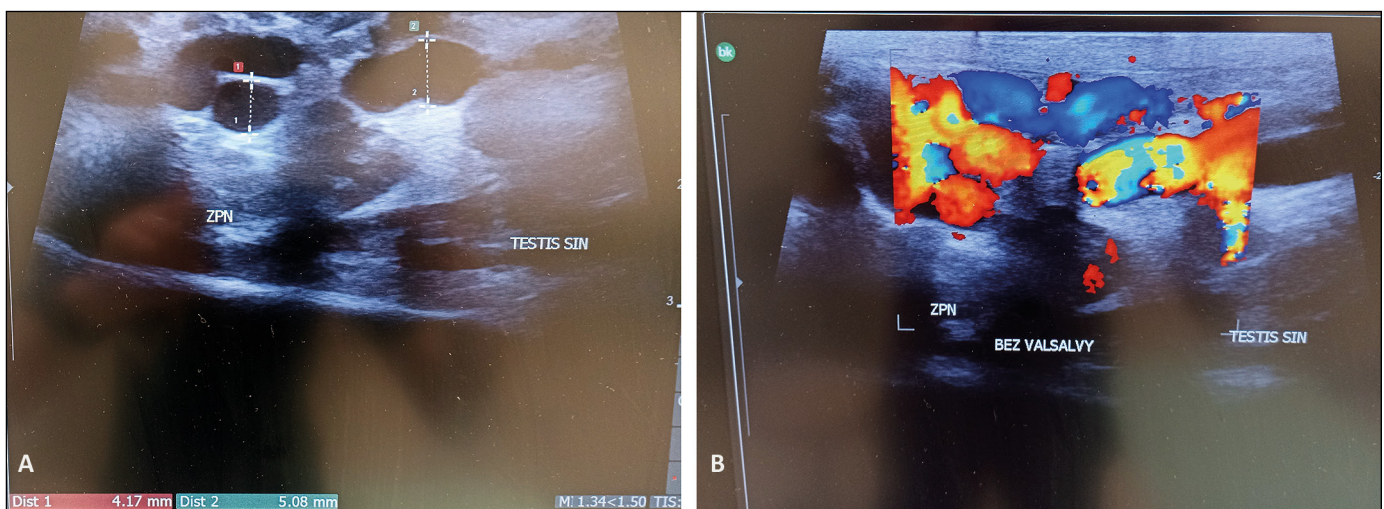


Figure 1. A. Left varicocele of the third degree (secondary to thrombosis). On ultrasound, dilatation of blood vessels up to 5 mm. Patient operated for varicocele. Thrombosis of the spermatic cord was confirmed by histopathology because, due to suspected tumour of the spermatic cord, the material was collected and submitted for histopathological examination. **B.** Visible venous return wave at rest (venous reflux without Valsalva test) in the study with colour Doppler option.

thrombosis of the seminal vein was originally misdiagnosed as a tumour of the spermatic cord. The described patient had undergone an orchidec-tomy of the right testicle 20 years earlier for tes-ticular seminoma. On physical examination, this patient had a thickened, painful left spermatic cord, and a lumpy mass was palpable in the inguinal re-gion in the projection of the spermatic cord. On ul-trasound examination, a blood vessel with trombus

mimicking the tumour was visible on B presentation (in shades of grey), with no apparent flow on Dop-pler techniques. Moreover, a dilated venous plexus (sized around 5 mm) with a visible backflow was found using ultrasound imaging with a Doppler func-tion (Figure 1A and Figure 1B).

The patient decided to have the spermatic cord varices embolized using interventional radiology techniques. After embolization procedure of the varicocele along with removal of the lesion from the venous vessel, a venous thrombus inside the vessel was confirmed by histopathological examination (Figure 2)

Quoting other authors, both, benign and malignant tumours of the spermatic cord should also be taken into account in the differential diagnosis of spermatic cord thrombosis [4, 17, 18].

In doubtful cases, the diagnosis of seminal vein thrombosis can be supplemented by CT imaging, to provide more accurate visualisation of the throm-bus in the external inguinal ring. CT imaging is also helpful in determining other aetiologies of the dis-ease, including consideration of seminal vein throm-bosis as an early sign of malignancy [19].

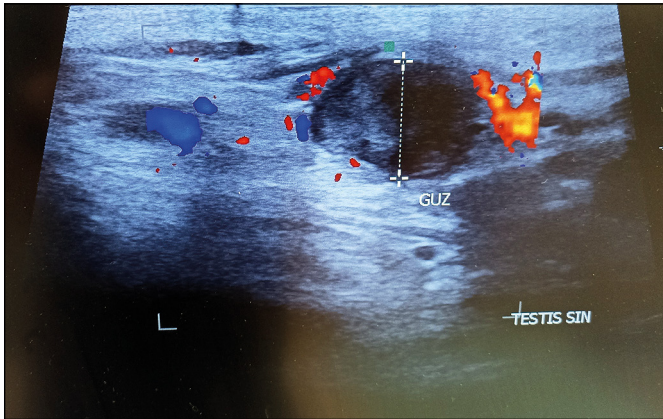


Figure 2. Intravascular venous thrombus measuring >9 mm in a patient with left-sided varicocele mimicking a tumor. The venous thrombus is marked with a measurement marker. The same patient as in Figure 1.

Treatment

Currently, there are no official recommendations for the treatment of spermatic cord thrombosis [2].

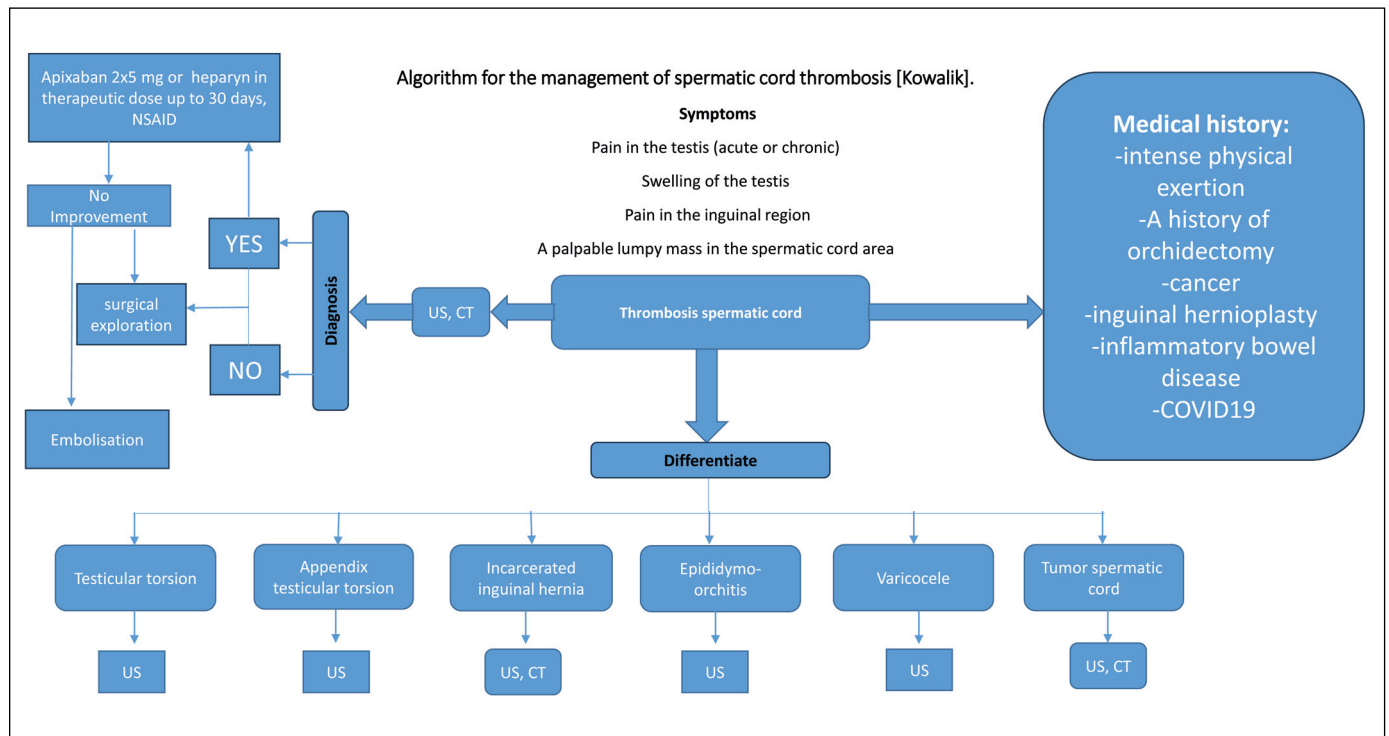


Figure 3. Algorithm for the management of spermatic cord thrombosis.

CT – computed tomography; US – ultrasonography; NSAID – non-steroidal anti-inflammatory drugs

Many authors prefer conservative treatment as first-line management [15].

Conservative treatment includes analgesics and anti-inflammatory drugs and tight underwear until symptoms resolve [15]. Some authors recommend to use heparin [14]. Cases of thrombus dissolution and resolution of pain after only a few days with apixaban have been reported in the literature [2]. However, in this disease, the choice between conservative and surgical treatment is still controversial [2]. Although conservative treatment has been used in many cases in the literature, it is acknowledged that surgical treatment remains the standard of care in order to unequivocally confirm the diagnosis and at the same time exclude other pathologies such as an incarcerated inguinal hernia or the presence of malignant disease [2, 19]. The author of this paper proposes an algorithm for the management of spermatic cord thrombosis [Figure 3].

Summary

Thrombosis of the spermatic cord is a rare disease. It can occur in men at any age. It most often affects the left side.

The disease is often misdiagnosed as an incarcerated inguinal hernia. Patients mainly complain of testicular pain with swelling, or pain in the inguinal area. The gold standard in the diagnosis of this condition is ultrasonography using Doppler techniques. Computed tomography is usually used as a complementary diagnosis to rule out other causes of seminal vein thrombosis.

Currently, there are no official recommendations for the treatment of this disease.

Cases of resolution of pain and dissolution of the thrombus after conservative treatment, including heparin or apixaban, have been described. However, it seems that a surgical intervention remains a standard practice in the final process of diagnosis allowing medical professionals to differentiate the cause of the condition.

CONCLUSIONS

1. Spermatic cord thrombosis may be a rare cause of testicular pain.
2. Doppler ultrasound has a critical role in the differential diagnosis of spermatic cord thrombosis.
3. CT imaging is a very helpful tool that can be used to determine the exact cause of the discomfort in the spermatic cord area.
4. Surgical treatment remains the gold standard of treatment if the diagnosis of spermatic cord thrombosis is uncertain.
5. Imaging test results provide a firm diagnosis of spermatic cord thrombosis. Conservative treatment can be introduced as an alternative. Conservative treatment includes the use of NSAIDs, low molecular weight heparin or apixaban for up to 30 days.
6. Embolisation is the preferred treatment method if the varicocele coexists with the spermatic cord thrombosis

CONFLICTS OF INTEREST

The authors declare no conflicts of interest.

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