

Surgical Management of Idiopathic Partial Thrombosis of the Corpus Cavernosum



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ABSTRACT

A 36-year-old African American man presented to the emergency department with 2 days of left-sided perineal pain after sexual activity. He was found to have induration in the left perineum overlying the proximal left corporal body. Clinical picture was suspicious for traumatic corporal rupture; however, advanced imaging showed a proximal segmental thrombosis of the left corpus cavernosum. The patient underwent perineal exploration with evacuation of an intracorporal penile hematoma. In spite of disrupting a fibrous membrane in the proximal corpora and drainage of the corpora, we observed repeat tumescence during the procedure because of an observed arterial high-flow state in the corpora cavernosum. This was resolved with administration of phenylephrine into the cavernosum. The patient had return of normal erectile function 2 days after the procedure with resolution of pain at the site. **Singh D, Larson T, Campbell K, et al. Surgical Management of Idiopathic Partial Thrombosis of the Corpus Cavernosum. Sex Med 2021;9:100273.**

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Key Words: Idiopathic Partial Thrombosis; Partial Priapism; Partial Segmental Thrombosis; Priapism

INTRODUCTION

Priapism is a full or partial erection related or unrelated to sexual stimulation and orgasm that lasts more than 4 hours after the inciting event that may cause permanent damage to the corpora cavernosum and result in erectile dysfunction.¹ 3 different etiologies of priapism have been described: ischemic (venous low flow), nonischemic (arterial, high flow), and stuttering priapism (recurrent ischemic priapism).¹ Priapism is uncommon with an overall incidence estimated to be 1.5 cases per 100,000 person years; however, partial segmental priapism or idiopathic partial thrombosis (IPT) of the corpora cavernosum is a significantly rarer entity with only 57 cases reported previously in literature.^{2–4} Although the first case was reported in 1976, the very low incidence has limited defining the pathophysiology behind the condition.⁵ Owing to the unclear etiology of this disease, we will refrain from using the term priapism and instead describe the condition as IPT of the corpora cavernosa as most

cases have observed a clot. Although the etiology remains elusive, a membranous septum (fibrous tissue) was found between the proximal and distal corpora cavernosa in 34 of the 57 cases.^{4,6} Some authors have argued this web of tissue predisposes patients to local thrombosis in the proximal crural veins.⁴ Others argue that the more likely explanation is bleeding secondary to trauma leading to hematoma development within the interstitium of the proximal corpus cavernosum.⁷ It is still unclear whether the disease is ischemic or nonischemic and whether the presence of this membrane is congenital or a result from local trauma and inflammation. Here we present the unusual case of IPT in which intraoperative findings revealed a high-flow arterial state after clot evacuation that contributed to repeated tumescence of the distal corpora cavernosa.

CASE

A 36-year-old African American man presented to the emergency department for evaluation of increasing perineal pain that started 1 day after sexual intercourse. The patient did not report any trauma during intercourse. He did not hear a “pop” associated with immediate penile detumescence. He was still able to maintain an erection during this time. The patient has no significant past medical or surgical history. The patient was not married and has no smoking history. On physical examination, no penile ecchymosis, eggplant swelling with discoloration, or butterfly sign was noted. However, there was a firm tender mass palpated at the proximal left corporal body in the perineal area

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extending to the base of the penis. Initial imaging was obtained including ultrasonography and computed tomography. Both confirmed a cylindrical lesion in the left corpora cavernosum suggestive of intracorporeal hematoma. Because of the concern for corporal rupture, a magnetic resonance study was then performed that showed the following (Figure 1):

“Tunica irregularity in the left corpus cavernosum with associated proximal hematoma and small volume overlying soft-tissue thickening/inflammation; no gross external disruption and extravasation; the appearance may suggest contained disruption, dissection of the corpus wall, or other sequelae of internal bleeding.”

A tunica rupture could not be ruled out as a cause of an intracorporeal hematoma. The findings were described to the patient. Because of persistent swelling and discomfort, he was prepared for surgical exploration and possible repair of tunica injury to mitigate the risk of possible erectile dysfunction and Peyronie’s disease. Initially, a 4-cm penoscrotal incision was made and taken down with sharp scalpel dissection. Electrocautery was used to dissect through the superficial dartos layer down to the corpora cavernosum and corpora spongiosum. A palpable corporal mass was noted to be just distal to the penoscrotal junction. It should be noted that during surgical exploration, there was no evidence of penile fracture or violation of the tunica albuginea of the left corporal body. The dissection was carried out further laterally, and we performed a partial degloving of the penis through our incision through which the proximal penis was able to be delivered. Sharp dissection was then used to open the corpora ventrally just above the palpable corporal mass. After the corporotomy was made, a blue, fibrous membrane was visualized and dilated. It should be noted the membrane was so thin that after dilation of the corporal body it was destroyed. Dark ischemic blood was evacuated from the left proximal corporal body. However, after surgical decompression of this area, bright red blood was observed at the site of the corporotomy, and shortly thereafter, the left proximal corporal body was noted to be rapidly engorging with new blood. This was suspicious for recurrent partial thrombosis or priapism of the proximal left corporal body. Treatment with injection of 200 mcg of phenylephrine into the left proximal corpora caused rapid and durable detumescence. The corporal body remained detumesced for the remainder of the case. The patient was discharged home later that day.

After treatment of the partial priapism, the patient was seen in follow-up 1 month after the procedure. Examination was normal, and the patient reported being able to have return of his normal erections without pain.

DISCUSSION

Although most cases of partial priapism have been noted to result from an inciting event such as trauma, sexual intercourse, or bicycle riding, several cases have been idiopathic.^{6,8} In almost

all cases, patients reported a painful perineal mass as did our patient. In addition, most patients with this condition present a few days after the onset of a painful perineal mass, thus indicating a more delayed and less acute pathology.⁹ The presented case was different in regard to the “typical” presentation. He presented acutely 1 day after sexual intercourse with symptom onset occurring immediately after intercourse, although it should be noted the patient was able to still obtain erections. Given the unusual presentation and persistence of perineal pain, the patient ultimately required surgical exploration to rule out possible corporal body injury.

Proposed etiology of IPT in the literature is the following: thrombus in the corpora cavernosa secondary to an observed fibrous membrane (present congenitally or acquired through trauma, which can be observed radiographically) or a corporal hematoma due to local trauma.^{4,7} As we noted earlier, most cases of IPT are associated with a fibrous membrane separating the proximal and distal cavernosa that is thought to predispose to thrombus formation when penile compression occurs resulting in venous stasis in the proximal crural venous system leading to a state of hypercoagulability. In our case after the fibrous membrane was destroyed and dark clotted blood was evacuated, high velocity bright red blood flow was observed, resulting in repeated tumescence of the distal corporal body. Although this is not definitive for nonischemic priapism, it is a well-cited characteristic of the condition (usually this high flow is observed on Doppler ultrasound), especially considering repeated tumescence was observed after this arterial flow was observed.¹ In addition, a possible nonischemic etiology may explain why many cases of IPT have been conservatively managed with nonsteroidal anti-inflammatory drugs and watchful waiting. Weyne et al (2015)⁴ showed a case series that proposed the aforementioned 2-hit membrane hypothesis resulting in thrombus formation, but a low-flow venous state should have been observed with clot evacuation instead of the high-flow arterial state. Another explanation for this observation is local trauma (from intercourse) caused by injury to the proximal corporal body that led to the development of a hematoma, and it could be reasoned after clot evacuation, the initial injury was exposed. It is important to note the etiology of the fibrous membrane is thought to be either congenital or acquired due to trauma but not enough data exist to make a distinction.⁴ Our patient had no known trauma before this incidence and is relatively young indicating this web of tissue may be a congenital anomaly. As more cases are added to the literature the differentiation between local corporal injuries with hematoma development, proximal corporal thrombus formation and nonischemic vs ischemic etiology should be elucidated.

The treatment of IPT differs among case reports in the literature. When the first case was described in 1976 by Hillis and Weems, the patient was treated with surgical exploration and takedown of a transverse membrane between the proximal and distal corpora cavernosum.⁵ It is reasoned that a presence of the

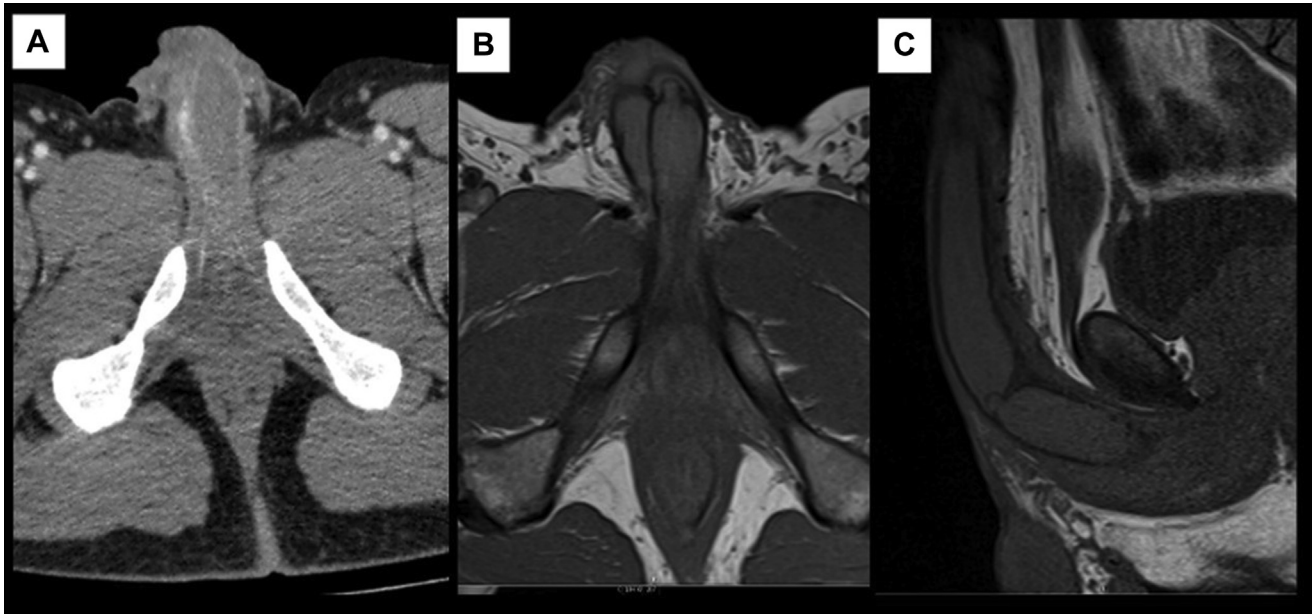


Figure 1. (A) CT abdomen and pelvis showing low-density cylindrical collection in the left corpus cavernosum. (B and C) MR axial and sagittal views, respectively, showing large blood collection in the left corpus cavernosum and tunica irregularity with possible septation. CT = computed tomography.

membrane that segments the corporal body explains unresponsive to intracorporeal phenylephrine in previous case reports of IPT. Since then, multiple case reports have reported surgically removing the membrane to re-establish continuity of the entire corporal body.^{6,8} Recently, reports have shown IPT can be treated with watchful waiting, nonsteroidal analgesic therapy, pentoxifylline, and even heparin.^{3,6,8} Although long-term follow-up is not well established, noninvasive spontaneous resolution has not been associated with adverse outcomes with erectile function.³ Other treatments have been proposed and include surgical exploration with corporal incision and evacuation.⁶ Only 2 prior case reports have been previously cited requiring corporal incision, drainage, and intracorporeal injection of phenylephrine.^{6,10} Lewis et al (2001)¹⁰ described a patient with partial priapism who failed initial intracorporeal phenylephrine. Therefore, that patient underwent surgical exploration with corporal incision and evacuation of clotted blood, along with creation of a corpora cavernosum-spongiosum shunt. In some cases, antithrombotic treatment therapies can be used to resolve a thrombus causing the partial priapism, but this was not considered in our case because of concern for tunica injury.⁶

Our case did not proceed with initial corporal aspiration and irrigation because of the concern on magnetic resonance findings for equivocal disruption of the tunica albuginea; therefore, we proceeded directly to surgical exploration with corporotomy, destruction of a fibrous membrane and evacuation of a proximal intracorporeal hematoma. A high-flow arterial state was observed after drainage of clotted blood with repeated tumescence of the distal corporal body. The repeated tumescence resolved after administration of intracorporeal phenylephrine injection.

Because ischemia or a low-flow state was *not* observed (in fact a high-flow state leading to tumescence was observed), a T-shunt procedure was not deemed appropriate. Typically, corporal aspiration and irrigation is performed on the distal shaft of the penis, which for this patient was not in continuity with the disease pathology in the proximal corporal body because of the presence of the fibrous membrane. Owing to the uncertainty of tunical injury before surgical intervention and our worry of causing damage to the structures in the proximal corporal body due to the presence of the hematoma, we decided against whole corporal body cannulation.

Although many patients with partial priapism are treated with creation of a cavernosum-spongiosum shunt after failure of percutaneous aspiration and irrigation with intracorporeal phenylephrine, some cases can be managed with a period of observation and symptom control.⁶ However, due to unclear long-term consequences of delayed intervention, it is reasonable to offer an early aggressive surgical approach especially in cases with acute presentation such as this one. Furthermore, surgical treatment may benefit in cases where a fibrous membrane is seen radiographically segmenting the corporal body. Destruction of this tissue results in reformation of continuous corporal body, relieves the compartment syndrome in the segment with IPT, and theoretically lowers the risk of future events, presuming the etiology is related to the web of tissue. It is important to note cases have been reported that have shown destruction of the membrane with administration of pentoxifylline, a nonspecific phosphodiesterase inhibitor that has antifibrotic and antithrombotic properties.⁸ Thus, medical therapy with pentoxifylline and nonsteroidal antiinflammatory drugs is a reasonable alternative

for therapy, provided there is no concern for tunical injury as there was in this case. Our reported case adds to the small existing body of literature, highlighting the unique presentation of IPT of the corpus cavernosum and the proposed management strategies to treat the pathology.

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