

High-Flow Priapism and the Importance of the Piesis Maneuver: A Case Report

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Abstract

High-flow priapism (HFP) during childhood is a very rare condition. Low-flow priapism (LFP) is an urological emergency, but HFP is not. Thus, it is important to make a differential diagnosis between LFP and HFP. The Piesis Maneuver can be used as a physical examination for differential diagnosis between LFP and HFP, as well as to roughly locate the arteriocavernosal fistula in childhood HFPs.

Keywords: Physical examination, priapism, ultrasonography

Introduction

Priapism, a prolonged penile erection lasting more than 4 h, is a rare condition in childhood (1). Priapism can be of three types: low-flow (ischemic), stuttering, and high-flow (non-ischemic) (1). High-flow priapism (HFP) is a rare condition usually caused by perineal trauma with the formation of an arteriocavernosal fistula (ACF) between the cavernosal artery and the lacunar spaces of the penis (2). Low-flow priapism (LFP) is a medical emergency; therefore, the differentiation between LFP and HFP is essential for proper treatment. With video footage, we would like to present the Piesis Maneuver in a 10-year-old boy with HFP.

Case Report

A 10-year-old boy presented with a painful, persistently rigid penis without a history of trauma. He was evaluated by the pediatric hematology department for LFP. During the work-up, penile color Doppler ultrasonography (PCDUS), which was performed from the penoscrotal region, yielded HFP without ACF. The patient was then transferred to the urology department for further evaluation and treatment. His medical history was unremarkable, but he remembered a straddle-type injury while biking about 3 weeks ago. The piesis maneuver was performed, and penile detumescence was achieved while compressing the perineum.

However, penile tumescence recurred when compression was released (Video 1; 00:11-04:23) (3). His initial PCDUS only evaluated the cavernosal artery velocities, which confirmed HFP. After the piesis maneuver, a more detailed perineal evaluation with color Doppler ultrasonography (CDU) showed bilateral ACFs (Video 1; 04:24-04:32). Ultrasound-guided compression was performed using a sandbag to achieve penile detumescence (4). Detumescence was achieved for 48 h, with two episodes of morning erections. After termination of compression, penile tumescence recurred. Thus, the patient was evaluated for super-selective fistula embolization (5). Pelvic digital angiography/digital subtraction angiography (DA/DSA) was performed to identify ACF (Video 1; 04:33-04:42). The DSA also confirmed very narrow bilateral ACFs, which were evaluated as unsuitable for super-selective embolization. Tranexamic acid treatment was started at a dose of 3x25 mg/kg. The parents were instructed to apply compression to the perineum with their hands for 30 min/h. After 24 h of this treatment, penis detumescence was achieved for almost 23 h. However, penile tumescence formed again after a morning erection. Although control perineal CDU yielded no visible fistula, penile tumescence was persistent (Video 1; 04:43-04:50). Therefore, under tranexamic acid treatment, 1 mL of 1/100.000 epinephrine solution was administered to the corpus cavernosum under sedoanalgesia.

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After the administration of epinephrine, penile detumescence was achieved. The patient was observed for an additional 24 h, and penile detumescence was persistent except for an approximately 15-min morning erection, and his pain resolved. The patient was discharged and followed up at 2-day intervals for one week. And then weekly for one month. His family and the patient himself declared no pain and no recurrent penile tumescence except for the morning erections.

Discussion

Non-ischemic, HFP is a rare etiology of priapism and occurs secondary to congenital malformation or from the development of arteriovenous malformation due to genital trauma (2). The fistula between the corpus cavernosum and the cavernosal artery, which is a branch of the internal pudental artery, is the most common physiopathological condition to develop HFP, as described in our patient. LFP is an urological emergency that can cause cavernosal necrosis and fibrosis; however, HFP is not a medical emergency (5). Thus, differential diagnosis between LFP and HFP is mandatory. Clinical diagnosis of HFP is based on a history of perineal trauma, physical examination showing a nontender, rigid/semi-rigid penis, and cavernosal blood gas analysis. The history of a straddle-type injury must be repeatedly questioned because the clinical features of HFP can be evident 2 or 3 weeks after the trauma, as seen in our case (6). The piesis maneuver determines whether it is HFP or LFP. After applying gradually increasing pressure on the perineal part of each corpora cavernosa for 2-5 min, if penile detumescence is achieved and after releasing the pressure, the penile tumescence resumes within 1 min, the piesis maneuver is positive (3). The affected corpora cavernosa can also be identified using the piesis maneuver. In our case, both corpora cavernosa were affected, which was later confirmed with penile CDUS and penile arterial angiography.

The routine procedure of PCDUS is performed from penoscrotal bulging of the corpora cavernosa, which may overlook perineal ACF, as in this study. The first PCDUS yielded high cavernosal artery velocities, which indicated HFP but did not identify ACF. After the positive piesis maneuver, evaluation of the perineal corpora cavernosum with CDUS identified ACFs in both corpora cavernosa.

The treatment of HFP can be performed using conservative methods such as perineal or penile compression or ultrasound-guided compression therapy (4). In this study, we applied ultrasound-guided compression, and penile detumescence was achieved for almost 48 h. In case of failure of conservative methods, selective arterial embolization may be another option (6). Thus, in this study, after unsuccessful conservative

treatment, we performed penile arterial angiography. Penile angiography yielded ACFs in both corpora cavernosa, which were very narrow and considered unsuitable for super-selective embolization by the interventional radiologist. Therefore, we attempted conventional angiographic fistula treatment with tranexamic acid, and to construct a cavernosal artery, we administered adrenaline into the corpora cavernosa. This treatment was successful, and persistent penile tumescence ended except for the morning erections. During the 1-month follow-up period no recurrence of HFP or LFP occurred, and the patient had successful morning erections.

Conclusion

In this HFP case, the piesis maneuver helped us to identify the location of the ACF despite routine PCDUS not confirming the ACF. The piesis maneuver can be performed in every childhood priapism case for differential diagnosis.

Ethics

Informed Consent: Informed consent was obtained from the patient.

Authorship Contributions

Surgical and Medical Practices: M.R.G., Concept: M.R.G., M.V.K., Design: M.V.K., C.Ö., Analysis or Interpretation: G.E., Ç.A., Literature Search: C.Ö., Writing: M.R.G.

Conflict of Interest: No conflict of interest was declared by the authors.

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Video 1. Table of contents of the video

00:11–01:28 Perineal compression

01:29–03:04 Penile detumescence

03:05–04:02 End of penile erection

04:03–04:23 Penile tumescence and full erection

04:24–04:32 Initial penile color Doppler ultrasonography (PCDUS) image indicating an arteriocavernosal fistula

04:33–04:42 Digital angiography and digital subtraction angiography images of arterio-cavernosal fistula

04:43–04:50 Post-treatment PCDUS image indicates no visible fistula