



Literature review and Case report: Treatment of recurrent attacks of idiopathic high-flow priapism in 13-year-old boy with Diazepam and local ice pad. Case report and literature review

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Abstract

Objective: Priapism is a fairly uncommon presentation to the emergency paediatrics department, but when it does present, it represents a real urologic emergency. Prompt treatment will decrease the risk of permanent consequences including impotency. Treatment should be based on aetiology, followed by an organized approach [1]. This report discusses a case of recurrent attacks of idiopathic priapism in a 13-year-old boy comparing the treatment with other experiences.

Patient and methods: A 13-year-old boy was diagnosed at our hospital with idiopathic priapism which always happened at waking up time and which responded to oral diazepam and local ice pad therapy. Diagnosis was confirmed after exclusion of all other causes. This type of management was compared with retrospectively reviewed and reported in the PubMed web site.

Results: Successful treatment of recurrent idiopathic priapism with oral administration of diazepam and local ice pad.

Conclusion: As the problem was solved completely after the fifth attack of priapism, the utilisation of oral diazepam and local ice pad therapy may be considered as a less invasive method for the management of recurrent idiopathic priapism in children.

Introduction

Priapism is a persistent penile erection that continues beyond 4 hours of duration, is unrelated to sexual stimulation and with no ejaculation [2]. Two variants of priapism have been well described: the ischaemic "anoxic" form also known as low-flow priapism and the non-ischaemic form or high-flow priapism. Priapism is considered a urological emergency. Immediate evaluation and treatment are needed to avoid severe erectile dysfunction related to intracavernous fibrosis. A number of different aetiologies of priapism have been described including perineal trauma, carcinoma of the penis or neighbouring organs, sickle cell disease, other rare types of anaemia, leukaemia, thromboembolic disease, neurological disorders, prolonged sexual stimulation, intracavernous injection of pharmacologic agents, and idiopathic causes [3-4].

Guidelines to treat priapism in paediatric and adolescence age have not yet been established because of rarity of published cases. In this article we shall review some of them.

When Hinman first described a neural type of priapism, he had observed that priapism occurs in patients with overt neurological disorders [5]. Munro et al reported an association between paraplegia and priapism. Their report consisted of 221 men, of whom 10% were assessed to have priapism, including 14% with cervical, 6.5% with thoracic, 5% with lumbosacral and 3% with cauda equina level injuries [6].

There were reported cases of intermittent priapism which appeared spontaneously with exercise and then resolved with rest. This has been seen to occur in relation to the cauda equina compression syndrome, a neurological syndrome which also includes intermittent low back pain, lower extremity dysesthesia and voiding difficulties [7, 8]. All symptoms of this syndrome are worsened by extension of the lumbar spine and relieved by flexion or sitting. Known diagnostic entities relating to the syndrome are lumbar disc

herniation [7], severe lumbar spinal cord stenosis [8], and cauda equina compression.

Hinman reported that idiopathic priapism was usually associated with sexual activity and a preceding event [10]. Idiopathic priapism is defined as a painful prolonged penile erection without a clear aetiology. Many investigators have reported that idiopathic priapism occupy 50% of all documented cases [9]. Some psychiatric centres reported cases of priapism in response to erogenous stimuli and genital manipulation [10]. Even sleep related involuntary erections can precede priapism episodes [5, 11, 12, 13].

Hinman also recognized that some recurrent forms of priapism have limited duration compared with true priapism, which he termed "acute transitory attacks or Stuttering Priapism" [5]. He also identified multiple, self-limiting, frequently recurrent priapism episodes in patients with sickle cell disease [14]. The attacks were beginning soon after puberty and then evolving variably during weeks, months or even years with some culminating in a major episode lasting 3 to 5 days and some up to 4 weeks [14, 15]. More than 40% of the men in this category experienced attacks during the waking hours [11]. Stuttering episodes have rarely been associated with complete erectile dysfunction [11, 14, 15].

Refractory priapism was described by some authors as a recurrent erectile state that immediately follows aspiration or incision of the corpora cavernosa for apparently ischemic priapism [10, 12, 16, 17]. This form of priapism resulted from rapid arterial blood refilling the penis after treatment rather than further venous congestion [10]. Use of blood gas analysis through penile aspirates supported this impression [12]. Additional investigators more recently used penile colour duplex ultrasonography to document the conversion of veno-occlusive priapism after initial treatment to a high flow non-ischemic form [16, 17].

Since arteriocavernous fistulas were not radiographically apparent in these cases, Hakim et al reported a 66% rate of recurrent non-ischemic priapism following initial embolization of an arteriocavernous tissue fistula for post-traumatic arterial priapism despite evidence of successful proximal arterial occlusion on selective pelvic arteriography [18]. Persistent elevated distal arterial blood flow was characterized by having a turbulent quality on colour duplex ultrasonography. The return to complete flaccidity was delayed even when detumescence started after selective embolization. Foda et al settled on the diagnosis of high flow priapism in a child with Fabry's disease [19], in which priapism had been reported and attributed previously to lipid infiltration of the cavernous tissue.

Priapism has been observed to occur also after drug administration. Rubin first identified this relationship and determined that it was cause and effect-based on his evaluation of patients in whom priapism developed after receiving the antihypertensive agents hydralazine and guanethidine [20]. Rubin reported the onset of recurrent self-limiting erections extending up to several hours in duration after consumption of these drugs.

Similarly rare priapism episodes have been reported with the use of alpha-adrenergic [21]. Priapism has also been associated with psychotropic and antidepressant agents such as trazodone trimipramine (tricyclic antidepressant) and clozapine [23] which implicate peripheral and central neuronal mechanisms for the erectile response [22, 23].

Intraurethral administration of alprostadil [24] and oral sildenafil [25] for erectile dysfunction have also been implicated in priapism in association with the corporeal smooth muscle relaxatory effects of the vasoactive drugs used in these therapies. General or regional (spinal or epidural) anaesthesia has been associated with priapism [26]. Highly refractory priapism resulting from heavy alcohol intake [5, 9], topical or intranasal cocaine [27], administration of immunosuppressant agent fk506 [28], and androgen therapy have also been reported. Boaz Meijer reported a case of neonatal priapism on the first day after birth which disappeared after 4 days of observation [40].

Case presentation

A 13-year-old previously healthy boy presented to the paediatrics emergency room suffering from prolonged (three hours) painful penile erection which occurred at the time of waking up in the morning. The patient had not been involved in intercourse, masturbation, proximal or remote trauma, drug or alcohol assumption and recent sport activity. There was no family history of sickle cell anaemia or leukaemia. One week before, he had presented with a similar attack which had been treated in another centre with oral diazepam and the application of a local ice pad with little response and then the penis had detumesced after a corpus cavernosum direct injection of alpha-adrenergic agonist "Etilefrine". He had been given oral diazepam at home just before coming to our hospital. In our paediatrics emergency department, clinical examination revealed erect corpora cavernosa without swelling of corpus spongiosum or ecchymosis, and moderate phimosis. Vital signs and other clinical parameters were in the normal range. The erection never detumesced and became progressively painful. Cavernosal blood gas analysis values were pH 7.39, pCO₂ 37.1 mmHg, pO₂ 53, 8 mmHg, HCO₃⁻ 21.9 mmol/L. Complete blood count and the coagulation profile were all in a normal range. Diazepam 2 mg orally was administered to him together with the application of a local ice compression but with moderate benefit. Toxicology tests were positive only for benzodiazepine. Andrological tests were requested, and echocolor Doppler sonography was performed at the base of the penis, which revealed asymmetric increased blood flow in the cavernous artery (Right 26 cm/sec, Left 40 cm/sec) with thickened area in the left proximal medium of corpus cavernosum tissue.

During hospitalization the patient was administered oxygen therapy 2L/min for 30 minutes before going to sleep. No secondary cause of priapism was documented. Haemoglobin electrophoresis, reticulocytes, alpha-fetoprotein, thyroid function test, Human chorionic gonadotropin (HCG), follicle-stimulating hormone (FSH), luteinizing hormone (LH), Testosterone, Dehydroepiandrosterone sulfate (DHEAS), pharyngeal smear, urine culture, electrocardiogram, abdominal ultrasound, haematological and andrological clinical tests resulted in the normal range. The patient was then discharged in good health.

One week after his discharge, the child at wake up time in the morning presented with an analogous episode which responded after 2 hours to diazepam 2 mg orally and with local ice compression.

One month later there were three other analogous episodes a distance of 15-20 days apart and all were responsive after 30 minutes to 1 hour to diazepam 2 mg orally associated with local ice compression.

The patient delivered to our emergency department during these episodes and was then discharged without any further treatment. After our patient had no recurrent similar attacks of priapism for eighteen months, he underwent to circumcision intervention due to moderate phimosis.

Priapism was defined idiopathic, by excluding trauma, haematological, pharmacologic and neurological causes.

Discussion

Recurrent idiopathic priapism is a rare condition and its treatment has not yet been standardised [29]. It is a difficult problem to treat and a true emergency for the physicians, and often even invasive therapeutic interventions fail. Idiopathic priapism commonly induces thoughts of an enigmatic disorder, in which penile erection persists more than four hours in the absence of sexual excitation.

This concept derive from the understanding of the physiological equilibrium of the penis, involving the interplay of different neuro-effectors, hormones, vaso-active substances, signal transduction systems and corporeal tissue, cellular and molecular factors which govern the tone of corporeal smooth muscle and determine its functional responsiveness to erectile stimuli [30-31].

The implication is that dysregulatory mechanisms provide a basis for priapism to occur

as a manifestation of an unbalanced erectile tissue response.

The major complication of the ischaemic type of priapism is the development of irreversible penile fibrosis resulting in definitive erectile dysfunction.

The risk factors are: duration of the priapism (with increasing risk beyond 48 hours) and incomplete detumescence despite therapy [32].

Few cases have been published and the unavailability of literature has made it impossible to develop evidence-based guidelines [2].

For many years, numerous methods have been employed for treatment of idiopathic priapism such as oral administration of Digoxin (positive inotropic agent), but it is difficult to maintain at its optimal serum level. Also, oral administration of Baclofen (γ-aminobutyric acid receptor agonist) and Gabapentin taken orally have proven to be a new effective alternative without serious effect on the normal erectile function[35-36].

Therapy with Ketoconazole and Prednisone is helpful to prevent recurrence of attacks of priapism [37].

+Dahm et al established that oral administration of antiandrogens resulted in a significant improvement in three patients with refractory priapism [34]. Steven et al confirmed that inhalation treatment by amyl nitrite was successful treatment for recurrent idiopathic priapism [37].

One of the traditional treatments of priapism is intracavernous injection of adrenaline which is used for young patients who have no cardiovascular disease [13-33].

Another alternative therapy is intracavernous injection of Methylene blue (a powerful inhibitor of nitric oxide), which is effective and safe in cardiac patients [38].

In our case the patient was treated for the first attack of priapism with intracavernosal Etilefrine injection.

In the 4 subsequent attacks, the administration of oral diazepam and the application of local ice were sufficient to obtain a complete detumescence after 1-2 hours. It may be that ice stimulates vasoconstriction which helps to drain out the blood from the corpus cavernosum and that Diazepam works by relaxing tension in the patient.

Conclusion

This case report shows that the administration of oral diazepam plus applications of local ice were sufficient to achieve a complete resolution of priapism after 1-2 hours. This treatment may be considered as one of the options for the management of recurrent episodes of idiopathic priapism.

However, our patient underwent intracavernosal injection with Etilefrine for the first attack, but the successive attacks were treated with oral diazepam and direct perineal application of ice.

Because this treatment was not invasive and our patient remained eighteen months free from priapism, we can consider oral diazepam and direct perineal application of ice as the first line for treatment of priapism.

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