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RESEARCH ARTICLE

EMERGENCY MANAGEMENT OF PENILE CONDITIONS - OUR INSTITUTE EXPERIENCE

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Abstract

Penile emergencies include a wide array of traumatic, vascular, or infectious etiology with uncommon presentations and require prompt medical evaluation. Penile emergencies can be treated conservatively or surgically, and their management often relies on prompt diagnosis. Missing or delaying diagnosis and treatment often results in permanent loss of function or, in some cases, loss of the affected organ itself. This case series aims to review major penile emergencies at our institute with peculiar attention to clinical presentation and practical management in order to provide the specialist with reliable information to keep in mind when confronting these challenging occurrences.

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Introduction:-

Acute penile injuries are a peculiar occurrence which demands specific attentions from the specialist in both the diagnostic and therapeutic approach to the patient. Thorough history taking is mandatory when first assessing the patient. The physical examination should include a complete evaluation of penis and testes, as well as the abdominal and perineal area [1]. Injury to other relevant organs should be taken into consideration, and therefore, the physical examination can be extended accordingly. The objective of this case series is to review the main penile emergencies. We present illustrative cases managed at our institute, focusing on the clinical diagnosis with relevant investigations and their management.

Penile trauma

Penile trauma may be blunt or penetrating. Penile fracture is related to a sudden pressure increase within the penile bodies, generally caused by an external force applied to the erect penis during vigorous sexual intercourse. Acute penile fracture manifests as an audible snap and sudden pain, followed by loss of erection, together with rapid swelling, generalized bruising, and deviation of the penis [2]. Fracture usually occurs unilaterally in the distal two thirds of the penis. When present, hematoma is usually confined to the penis but can extend to the scrotum, perineum, and thighs. Imaging examinations are essential to evaluate the integrity of the tunica albuginea. Rupture of the tunica albuginea is characteristic of penile fracture and may occur in one or both corpora cavernosa or less commonly, in the corpus spongiosum and surgical management is indicated in most cases. It is noteworthy that the tunica albuginea and Buck's fascia are indistinguishable by imaging methods [3]. Ultrasound is the primary imaging

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method for the assessment of penile trauma, which shows the normal anatomy; location and extent of the tear, which is seen as a thin echogenic line disrupting the tunica albuginea. A hematoma can be seen in the skin or deep in Buck's fascia and is helpful to identify the site of the tear, appearing as an anechoic area or heterogeneous collection [3].

In cases of penile trauma, especially those in which there is a small tear, MRI can be done if the ultrasound findings are inconclusive. A tear in the tunica albuginea appears as discontinuance of the hypointense signal of the tunica on T2-weighted sequences and that may be accompanied by intracavernosal or extratunical hematoma [4]. In penile trauma with hematuria or urinary retention, urethral injury is suspected and retrograde urethrography is always indicated for the evaluation of a urethral tear [4].

In small tears without hematoma or urethral injury, conservative management can be an option. Urgent surgical repair is usually necessary in cases of a tear in the tunica albuginea, and identifying the exact location of the fracture allows better surgical planning and localized surgical exploration [5].

Case:

A 30 year-old male presented to the emergency department for evaluation of pain and swelling of his penis. The patient had history of rolling over bed with erect penis following which he developed detumescence, penile pain & swelling. On examination, there was penile swelling, ecchymosis over penile shaft. Penile ultrasound examination showed 6mm defect in right ventrolateral aspect of tunica albuginea with overlying hematoma.

The patient was taken to the OR, where a horizontal tear was found in the right ventral aspect of the tunica albuginea and corpora at proximal shaft level with hematoma. Urethra was normal. The defect was repaired with 2-0 polyglactin. Post operatively, the patient was followed up at 2 and 4 weeks and found to have good erection.



Fig. 1– Penile swelling and ecchymosis

Fig. 2–Tunica albuginea defect in ventral aspect of proximal penile shaft

Penile strangulation

Penile strangulation injury is a rare clinical entity that can be challenging to manage for the treating specialist. Penile strangulation occurs as a compartment syndrome in which the penile shaft is circumferentially constricted and trapped by an object, resulting in venous and arterial flow impairment and consequent vasculogenic damage to the corpora cavernosa. Prolonged and unresolved strangulation may lead to oedema, ischemia, urethrocutaneous fistula, and tissue necrosis with penile amputation [6].

Adolescent and adults often report penile strangulation injuries due to various kinds of rings employed for sexual gratification or even sexual abuse: wedding rings, rubber bands, metallic plumbing, bottle necks, etc. Due to the social stigma, it is possible that medical attention-seeking is delayed in this age group, potentially worsening the clinical presentation. Strangulation injury may also lead to acute retention of urine. After immediate removal of the offending object, a complete assessment of damage using urethral methylene blue test or voiding urography is done [7].

Every attempt to remove the constricting object must be made promptly and with an appropriate method in order to preserve the integrity of the involved anatomical structures. In the case of acute urinary retention, emptying the

bladder may be required by transurethral (when possible) or suprapubic catheterization. When all possible attempts at removing the object fail, surgery is the only remaining option. Degloving of the penile shaft is followed by penile reconstruction techniques ranging from skin grafting to total phallic reconstruction, depending on the extent of the injury [7].

Case:

A 40 years old man who had psychiatric illness presented to the emergency department with history of distal penile swelling following tying penis with a thread for one year. On examination, there was a constriction at distal penile shaft level with erosion of spongiosa & most corpora (Fig. 3 and 4). Urethrocutaneous fistula with exposed urethra and urethral defect (Fig.5) was found.

The constricting thread was removed & wound debrided. Suprapubic catheterization done and the wound left to heal in secondary intention and advised follow up. The patient defaulted for follow up.



Fig. 3:- Thread causing constriction in distal penile shaft **Fig.4**Erosion of corpora by the thread.



Fig. 5:- Urethrocutaneous fistula with urethral defect.

Priapism

Priapism is defined as a penile erection lasting longer than 4 hours in absence of sexual stimulation. Incidence of priapism ranges between 0.3 and 5.4 per 1,00,000 males per year [8]. Based on patient history and pathophysiology, two variants of priapism can be defined: ischaemic or low-flow priapism (IP) and non-ischaemic or high-flow priapism (NIP). IP is the most common type of priapism, accounting for 95% of cases; it is characterized by a minimal or no arterial inflow associated to complete occlusion of venous outflow of the corpora cavernosa; the resulting state of acidosis, glucose deficiency and hypoxia induces oedema, inflammation, and progressive necrotic degeneration of smooth muscle cells leading to erectile dysfunction [8].

Stuttering or intermittent priapism is a subtype of IP characterized by an history of recurrent self-resolving painful erections usually occurring in patients with sickle cell disease (SCD) or other hematologic diseases. The most frequent causes of IP are the recreational use of erectile agents (intracavernous injection of alprostadil, papaverine, phentolamine or, rarely, oral PDE-5 inhibitors) and the use of antipsychotics or trazodone. Hereditary hematologic

pathologies or blood cancers can cause IP by altering blood viscosity. Rarer etiologies include amyloidosis, pelvic tumours, spinal cord, or peripheral nerve injuries. NIP is caused by the disruption of cavernous tissues almost invariably due to pelvic or genital trauma (straddle injury) resulting in an arteriolar-sinusoidal fistula leading to excessive corpora blood flow.

Clinical presentation of IP is characterized by a fully rigid erection often associated to penile pain. Glans and corpus spongiosum of the urethra are often flaccid. In contrary, NIP typically manifests as a painless, incomplete erection that occurs after days to weeks from a pelvic trauma [9]. A natural erection during sexual stimulation or for nocturnal penile tumescence can be the trigger for both.

The goal of emergency management of priapism is the resolution of the acute episode to preserve the long-term erectile function. Management should include at least patient's medical history, physical examination, corporal aspiration, and penile blood gas analysis [9]. Physical examination must also include the evaluation of the abdomen and perineum.

Penile blood aspiration is performed by inserting a large bore (19-gauge or higher) butterfly needle in one or both of corpora cavernosa under penile nerve block. One drain puncture is enough for detumescence since corpora usually communicate through an incomplete midline septum; needle can be inserted either into corpora tip, through the glans, or into the middle of the shaft; in this case, 3 or 9 o'clock positions are preferred to not damage the urethra and the dorsal neurovascular bundle.

Initial aspirated blood will help differentiation between priapism types, being dark red in IP and bright red in NIP. Blood gas analysis is necessary for confirmation: in IP, blood gas values are typical of hypoxemic acidotic blood. Colour duplex Doppler ultrasonography of the penis can be used in conjunction with or as an alternative to penile blood gas analysis to differentiate between IP and NIP.

NIP must be promptly recognized and distinguished from IP owing its relative low risk in developing ED and the tendency to spontaneous resolution. NIP should be treated conservatively with ice and pelvic compression and/or angioembolization of the arterial-sinusoidal fistula after 1–2 months after onset. NIP is therefore not a medical emergency and will not be discussed further.

The treatment of stuttering priapism is same as for IP which is described below; however, a supportive therapy for the underlying hematological condition like hydration, oxygen administration, and blood transfusions may be required.

In IP, corporal aspiration should be continued until arterial blood is seen through the syringe and complete detumescence is reached; restoration of oxygenated blood is required for preventing smooth muscle necrosis, fibrotic degeneration, and long-term ED. Cold saline irrigation with 0.9 NaCl is often associated to aspiration to promote evacuation of blood clots. Aspiration is resolute in most of IP cases. In case of failure, injection of sympathomimetic agents like Phenylephrine is used, given its high selectivity of $\alpha 1$ -adrenoreceptors with low systemic cardiovascular effects. A dose of 100 to 200 μg of phenylephrine must be injected at intervals of 3–5 min until detumescence. A cumulative dose of 1000 μg is considered the maximum to avoid significant adverse events (hypertension or bradycardia) in adults [10]. Pulse and blood pressure sequential monitoring is required during administration and for at least 1 hour afterwards. The efficacy of aspiration/irrigation and sympathomimetic injection is reported to be around 80%.

In case of failure of the above measures, surgical management of IP should be considered. Surgical procedures for IP are divided in shunting procedures and penile prosthesis implantation (PPI). Shunting is the first-line treatment after aspiration/injection and are distinguished in proximal and distal shunting; goal of both is the drainage on hypoxic blood and restoration of venous outflow of the corpora cavernosa by the creation of an iatrogenic fistula with other structures [10].

Shunt procedures must be reserved to patients with IP lasting less than 24 hours. Within this time limit, the changes in smooth muscle are still reversible and men who have achieved detumescence recover their potency in nearly all cases. On the other side, patients with IP lasting longer than 36 hours are bound to develop ED and must be treated with PPI [10]. PPI is usually performed between 2 and 3 weeks after IP onset. This time window seems to balance the risks associated with an early implantation. In patients with IP lasting longer than 24 hours but less than 36

hours, the decision on the type of procedure to perform can be guided by a contrast-enhanced penile MRI, that has been shown to have an extremely high sensitivity in detecting necrosis/fibrosis of the smooth muscle.

Case 1:

A 34 years old male presented to the emergency department with history of persistent painful penile erection after his penile Doppler test using intra-cavernosal Papaverine. Erection was lasting for more than 6 hours. A diagnosis of drug induced priapism was made. Under penile block, cavernosal blood aspiration done & pH of aspirated blood was 7.021. Ischemic priapism was confirmed. Intracavernosal aspiration with irrigation with cold saline was done followed by intracavernosal injection of 100µgphenylephrine. Detumescence was achieved. Patient was followed up at 2 weeks &4 weeks and found to have normal erectile function.



Fig. 6:- Ischemic priapism.

Case 2:

A 26 years old male , who is a known Acute Myeloid Leukemia presented with intermittent episodes of persistent penile erections lasting more than 8 hours. He is undergoing chemotherapy for AML. There was a history of cavernosal blood aspiration done elsewhere 2 days back. A diagnosis of stuttering priapism was made. Intracavernosal aspiration with phenylephrine injection was done & detumescence achieved. On 2 weeks follow up, the patient had erectile dysfunction. He continued chemotherapy for AML and lost to follow up in urology department.



Fig. 7:- Stuttering priapism.

Summary:-

Despite the relative diminutive size of male genital organs compared to other organs of the body, the functional complexity and the spectrum of associated diseases and vulnerabilities to injury are truly remarkable. Appropriate clinical history with relevant necessary investigations guide to diagnosis. Ultrasound is the primary imaging modality for the initial evaluation, and MRI may be useful in selected cases. Timely management of these conditions can have lifelong implications to urologic health and normal sexual function.

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