

# SUCCESSFUL MANAGEMENT OF PRIAPISM SECONDARY TO LEUKEMIA - A CASE REPORT

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## Summary:

*Background: Priapism due to sickle cell disease is common but rare due to leukemia. Here in we report a case of priapism secondary to leukemia, which was managed by aspiration followed by glanulocavernous shunt.*

*Materials and Methods : A 16-year-old male presented with prolonged involuntary painless erection of 24 hours duration. The physical examination and Doppler USG revealed low flow priapism. Blood parameter showed increase leukocyte Count indicating leukemia. We treated the patient successfully by cavernous*

*Lavage with adrenaline, an alpha-1 adrenergic agonist, followed by glanulocavernous shunt.*

*Results: Complete detumescence was achieved after second time puncture - Lavage of the cavernous.*

*Conclusion: We conclude that priapism due to leukemia can be best treated With adrenaline lavage until full detumescence achieved.*

*Key Words: Priapism, detumescence, glanulocavernous shunt.*

## Introduction:

Priapism is usually defined as an abnormal persistent erection of the penis unrelated to sexual stimulation and unrelieved by ejaculation (Fig.1). The penis is composed of 2 corpora cavernosa, the corpus spongiosum, which contains urethra. These corpora are capped distally by the glans penis. Each corpus is enclosed in a fascial sheath known as tunica albuginea and a thick fibrous envelope known as Buck's fascia surrounds all. The tunica albuginea of the corpus cavernous is a bilayered structure with multiple sub layers. The inner circular bundles support and contain the cavernous tissue.<sup>1-3</sup> From this inner layer radiate intracavernous pillars, which provides essential support to the erectile tissue. The outer layer bundles are oriented longitudinally. Emissary veins run between the inner and outer layers for a short distance, often piercing the outer bundles obliquely. Branches of the dorsal artery takes a more direct perpendicular route. The outer layer of tunica albuginea appears to play an additional role in

compression of the vein during erection. The paired internal pudendal artery is the major carrier of the blood supply to the penis. The terminal part of this artery divides into 3 branches, supplies the corpora cavernosa<sup>4-8</sup>.

In the normal male, penile erection may last for several minutes to 1 hour or more under erotic stimulation. An erection lasting longer than 4 - 6 hours is considered to be priapic<sup>9</sup>.

The urological condition priapism gets its name from Priapus. In Greek Mythology, Priapus was a minor rustic fertility God of purely phallic character, protector of livestock, fruit plants, gardens and male genitalia. Priapus was a son of Aphrodite. Aphrodite was the Greek Goddess of love and beauty, and goddess of physical love.

Priapism may be classified into 3 different types: low flow, ischemic, anoxic or veno-occlusive priapism, second, high flow, arterial or non-ischemic priapism, and third is recurrent or shuttering priapism. High flow priapism occurs due to trauma, which results in loss of penile blood flow regulation. In low-flow priapism usually presents with several hours of erection. The glans penis and corpus spongiosum are soft and uninvolved in the process. The low-flow type is more common and dangerous, as these patients are susceptible to greater complications and the long-term recovery of erectile function is dependent on prompt and urgent intervention.

The mechanism of priapism remains in debate, but most authors believe the abnormality to be physiologic obstruction of the venous drainage. This obstruction causes highly viscous, poorly oxygenated blood (low O<sub>2</sub>, high CO<sub>2</sub>) within the corpora cavernosa.<sup>9-10</sup> Penile erection occurs as a result of increased blood inflow to the penis, engorgement with blood, and decreased outflow of blood from the penis. Primarily the process is mediated by nitric oxide. Many researchers investigated to know the mechanism of erection in normal condition. Sexual stimulation causes the release of nitric oxide (NO) via stimulation of nonadrenergic, non-cholinergic neurons. Nitric oxide causes vasodilatation<sup>7-9</sup>.

Herein, we report a case of priapism due to leukemia, which was treated successfully with adrenaline

intracavernous injection followed by glanulocavernous shunt formation.

### Case report

A 16-year-old boy was referred to our hospital, for sustain erection of penis longer than 24 hours duration. He was not clinically anaemic. General examination revealed no abnormality. He had no history of trauma. The patient was initially diagnosed as a case of priapism and was treated with ice cool application around penis for 1 hour. The patient did not respond to this management, so complete blood count was requested. The white blood cell count was more than 100000/mm<sup>3</sup> of blood. Doppler USG was done, which revealed low-flow of blood to the penis. In view of the patient's clinical condition, he was admitted to the Urology ward for further management. After general anaesthesia an 18G I/V cannula inserted through the glans penis to the corpora cavernous ( Fig. 2). Milking of the shaft of the penis was done in order to empty both the corpora cavernosa for quick detumescence. Cannula was kept in-site for more 24



**Fig.-1:** Priapic penis



**Fig.-2:** Diagrammatic representation of glanulocavernous shunt

hours. At the same time treatment of leukemia was started. Recurrence of priapism was occurred after 24h. For which same procedure was done under G/A. At this time intracavernous adrenaline injection (1/100000 strength) and milking of the shaft was done simultaneously.

At the end of the procedure a true-cut biopsy needle was inserted through the cannula site to the cavernous muscles for glanulocavernous shunt. Postoperative period was uneventful.

### Discussion

Priapism due to leukemia is an uncommon condition but an urologic emergency, which require rapid detumescence to prevent erectile dysfunction. It causes impotence, a devastating condition for male, if not treated urgently. In most cases of priapism, treatment invites draining of the stagnant blood with prevention of further blood flow into the penis, with a cannula inserted into the corpus cavernous through glans penis. Medication that acts on the blood vessels can also be injected to help shrinkage of blood vessels and thus decreases blood flow into the penis.

Leukemia is a neoplastic disorder of blood, which require medical attention. In Leukemia white cell count in blood increases to high level, subsequently blood viscosity increase. Leukocytes trapped inside sinusoids of corpora cavernous muscles of the penis, the sinusoid engorged as well as penis engorged and enlarged. But the venous return stop due to blockade of the emissary veins. These causes sustain erection of the penis. For treatment of priapism, leukemia should receive prompt chemotherapy. We diagnosed priapism and started chemotherapy immediately. The patient came to us in late. So, there is more chance of impotent development. Our described technique for treatment of priapism is based on knowledge of penile blood circulation during erection and detumescence condition as described by others<sup>11-13</sup>.

Adrenaline is an alpha-adrenoreceptor agonist that causes vasoconstriction. This agent has been extensive studied with regard to its efficacy in the control of priapism.<sup>9-11</sup> Numerous clinical trials using multiple doses format as injection inside corpora cavernous have demonstrated tremendous efficacy for detumescence of priapic penis<sup>11-12</sup>.

Xiao. H. et al. also documented a significantly earlier return of detumescence, preventing impotence with adrenaline intracavernous injection<sup>11,18</sup>. We have shown successful effect of intracavernous adrenaline injection followed by glanulocavernous shunt formation in our patient. Result from our treatment is in agreement with

those of earlier report<sup>11-13,15</sup>. The slugged blood evacuated from the corpora through a large bore needle. The addition of adrenergic injection via intracavernous irrigation has proved helpful<sup>13-17</sup>. Multiple wedges of tissue can be removed via a true-cut biopsy needle to create a shunting fistula between the glans penis and corpora cavernosa. This technique, which has been very successful, provides an internal fistula to keep the corpora decompressed. Our technique was similar to those techniques<sup>18-20</sup>.

The recurrence after first manipulation of priapism in our case corresponds to the inaccurate technique of detumescence. Therefore, we currently recommend exclusive use of adrenaline during detumescence of priapism. We feel that recurrence in our case was due to incomplete evacuation of the stagnant blood in first time, for which we performed milking second time, until phallus of the penis became completely soft. We also recommend glanulocavernous shunt with a true-cut biopsy needle after adrenaline injection and milking. We know that the pathological cause of priapism in our case was due to Leukemia; therefore, it seems clear that despite the chance of ED, this minor surgical procedure for priapism treatment is of great value in this case.

**Conclusion :**

With the detumescence procedure for priapism in our case, we believe that our technique is of highly effective. Therefore, we recommend adrenaline intracavernous injection for the treatment of priapism followed by shunt formation. Longtime follow-up is necessary to see ED for those who come in delay after onset of priapism.

**References :**

1. Breza J. et al: Detailed anatomy of penile neurovascular structure: Surgical significance. *J Urol* 1989;141: 437.
2. Hsu G-L et al : The three dimensional structure of the human tunica albuginea. *Anatomical and ultra-structure levels*. In *J Impotence Res* 1992; 4:117.
3. Kara can I, Aslam C, Hirshkowitz M : Erectile mechanism in man. *Science*, 1983; 220:1080.
4. Lue TF, Tanagho EA : Functional anatomy and mechanism of penile erection, In ; Tanagho EA, Lue TF, Meclure RD ( editors) : *Contemporary Management of impotence and Infertility*. Williams and Wilkins, 1988.
5. Lue TF et al .: Hemodynamics of erection in the monkey. *J Urol*. 1983; 130: 1237.
6. Lue TF .: The mechanism of penile erection in the monkey. *Semin Urol*. 1986; 4 : 217.

7. Newman HF, Northup JP. Devlin J.: Mechanism of human penile erection. *Invest Urol*. 1964;1 : 350.
8. Shirai M. et al. : Hemodynamic mechanism of erection in the human penis. *Arch Androl*. 1978; 1 :354.
9. Van der Horst C., Stuebinger H., Seif C., et al. : Priapism - etiology, pathophysiology and management *Int Braz J Urol*. 2003 Sep-Oct ; 29(5): 391-400.
10. Thomas CB and Paul CP. : Injuries of the external genitalia. In Harrison JH, Gitters RF, Perlmutter AD, Stamer TA, Walsh PC. (Eds) : *Campbell's Urology*. 4th Ed. pp 931 - 945, Philadelphia, W.B. Saunders Company, 1978.
11. Xiao, H., Liu J., Wang S., et al., One case report of clitoral priapism and literature review. *Zhonghua Nan Ke Xue*, 2004 Jul; 10 (7): 524 - 5.
12. Shamloul, R, el Nashaar, A. : Idiopathic stuttering priapism treated successfully with low-dose ethinyl estradiol : a single case report. *J Sex Med*. 2005 Sep; 2(5): 732-4.
13. Chang MW. Tang CC., Chang SS., Priapism- a rare presentation in chronic myeloid leukemia : case report and review of the literature. *Chang Gung Med J*. 2003 Apr; 26 (4) : 288 - 92.
14. Tudorin T.: My views about the applied anatomy of the penis and the physiopathology of erection. *Arch Ital Urol*. 1989; 61 :249.
15. Jordan G, Lebret T, Levine L. et al.: Priapism. *J Sex Med*, 2004 Jul; 1(1): 116-20.
16. Keoghane SR, Sullivan ME, Miller MA. The etiology, pathogenesis and management of priapism. *BJU Int* 2002; 90: 149-154.
17. Sayer J., Parsins CL.: Successful treatment of priapism with intracorporeal epinephrine. *J Urol*. 1988; 140: 827.
18. Van Driel MF. Mooibroek JJ., Mensink HJ.: Treatment of priapism by injection of adrenaline into the corpora cavernosa penis. *Scand J Urol Nephrol*. 1991; 25(4): 251-4.
19. Keskin D., Cal C., Delibas M, Ozyurt C., Gunaydin G., et al. Intracavernosal adrenaline injection in priapism. *Int J Import Res*. 2000; 12(6): 312-4.
20. Chen CC., Wang CJ. Chen CW., et al. Management of low-flow priapism using the Winter Procedure: a case report. *Kaohsiung J Med Sci*. 2003Feb; 9(2): 88-92.

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