Indian Journal of Clinical Anaesthesia 2021;8(2):349–351

Content available at: https://www.ipinnovative.com/open-access-journals

Indian Journal of Clinical Anaesthesia

Journal homepage: www.ijca.in

Case Report

Management of intra operative priapism after spinal anesthesia with intravenous glycopyrrolate and intracorporeal injection of ultra low dose of phenylephrine- A case report

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ARTICLE INFO

Article history:
Received 10-01-2021
Accepted 27-01-2021
Available online 01-06-2021

Keywords:
Priapism
Spinal anesthesia
Phenylephrine
Glycopyrrolate

ABSTRACT

Priapism following neuraxial anesthesia or general anesthesia is a rare but problematic event which may result in delay, complication or even cancellation of scheduled operations in urological endoscopic procedures. We present a case of successful management of intra operative priapism in a 32 years old male under spinal anesthesia posted for Ureteroscopic Lithotripsy (URSL) of bilateral ureteric stone.
Different therapies for management of intra operative priapism have been quoted in the past like intracorporeal injection of vasopressors, dorsal penile nerve block, intravenous glycopyrrolate, intravenous ketamine/dexmedetomidine etc. In this case we treated with intravenous glycopyrrolate and intracorporeal injection of ultra low dose phenylephrine.

1. Introduction

Priapism or tumescence is defined as persistent penile erection unrelated to sexual excitation which when left untreated for more than four hours will result in oedema, abrasion, tissue drying and eventually necrosis of the penis.[1,2] The incidence ranges between 0.1 and 2.4% with predominance in young male. It is a troublesome event in urological endoscopic procedures causing delay, greater risk of complications such as bleeding and stricture formation or even cancellation of scheduled operation.[1,3]

The penis is male organ of copulation, it is composed of three elongated masses of erectile tissue namely right and left corpus cavernosa and a median corpus spongiosum. During erection of the penis these masses becomes engorged with blood leading to enlargement and compression of the urethra hence obscuring urological endoscopic procedures.

The sensory nerve supply to the penis is derived from dorsal nerve of penis and illioinguinal nerve. The penis is also innervated by autonomic nerves. The sympathetic nerves arising from T10-L2 are the vasoconstrictors, responsible for maintaining the flaccidity. The parasympathetic nerves arise from S2 to S4 are vasodilators causing inflow of blood and is responsible for achieving and maintaining erection.Hence sacral parasympathetic input is responsible for tumescence and thoracolumbar sympathetic pathways are responsible for detumescence.[4]

The etiology of priapism can be primary, secondary or idiopathic.[5] Priapism under neuraxial block is reflexogenic whereas in general anesthesia is both psychogenic and reflexogenic.[6] With psychogenic stimulation arising from heightened sensory input or dreams under anesthesia and reflexogenic stimuli arising from washing, touching or instrumentation during early stages of neuraxial block when the pathways involved are still incompletely blocked.[7]

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https://doi.org/10.18231/j.ijca.2021.065

2. Case Report

A 32 years old male, American Society Of Anesthesiologist physical status II, smoker and social alcohol drinker was posted for Ureteroscopic Lithotripsy (URSL) for bilateral ureteric stone.

All his preoperative investigations and vitals were within normal limit. In the operating room after obtaining the consent and securing the Intravenous line, standard monitoring was instituted. His baseline blood pressure was 120/70 mmhg and heart rate was 68 beats per minute. He was given spinal anesthesia under all aseptic precautions with 25G Quincke spinal needle through L3-L4 interspace with 2.8 milliliter of Bupivacaine 0.5% heavy with 10 microgram Fentanyl intrathecally in sitting position. After achieving sensory block upto T10 dermatome, patient was put in lithotomy position. After washing and draping, the urologist noticed a penile erection. His attempt to insert the urethreoscope was failed as the penis was already tumescent. We waited for 20 minutes for spontaneous detumescence by applying cold saline compress to the penis. Injection Glycopyrrolate 0.2 milligram intravenous was given. Modest increase in heart rate was noted. Tumescence still persisted. The surgeon then performed the intracorporeal aspiration of blood from the penis for about 10 minutes, yet flaccidity could not be achieved. Then intracorporeal injection of 200 microgram of Phenylephrine was given and spontaneous detumescence was achieved within few minutes and surgery could be performed with ease.

His intra operative and immediate post-operative vitals remained stable.

3. Discussion

Priapism is prolonged and persistent penile erection without sexual stimulation, which when left untreated for more than four hours can result in oedema, tissue drying and necrosis of penis.[1,2] Etiology of priapism can be primary,secondary or idiopathic.[5] Priapism with primary etiology is not accompanied by a disorder responsible for a prolonged erection like physical or psychological origin. Secondary priapism is induced by factors directly or indirectly affecting the penile erection like haematologic such as sickle cell anaemia and polycythemia; traumatic such as pelvic trauma, spinal cord injury, surgical, neoplastic, and neurologic such as spinal cord tumour or infective such as syphilis and urethritis; or pharmacologic such as antidepressants and antihypertensives.[5]

Imbalance between sympathetic and parasympathetic nervous system is considered as the underlying cause of intra operative priapism.[8] Psychogenic or reflex erection can occur during local stimulation during washing or instrumentation during early stage of neuraxial block before complete sensory block.[6] Another possible explanation is incomplete blockade of sacral segments of the spinal cord during spinal anesthesia.

The mechanism of penile erection is a very complex phenomenon. In the flaccid state, the arterioles are partially closed, while the venules and the arteriovenous channels remain open, providing an unimpeded drainage of the arterial inflow.[4] Any reflexogenic or psychogenic stimuli will result in stimulation of sacral parasympathetic outflow, causing dilatation of arteries which pours an increased amount of blood in cavernous space of the corpora cavernosa. Blood is also poured into the corpus spongiosum. This enlargement presses on the veins preventing outflow of the blood.[9]

Irrespective of the etiology intra operative priapism should be immediately treated to prevent complications like fibrosis and thrombosis.[1] Various therapeutic options commonly advocated for treatment of penile erection are mechanical like sustained perineal compression and ice packs, pharmacological like intravenous ketamine[10,11] intracorporeal injection of alpha agonist like Phenylephrine,[12] intravenous (glycopyrrolate[13] and terbutaline,[6] intracorporeal epinephrine,[14] increasing the depth of anesthesia with inhalational anesthetics, ice packs, removing blood, dorsal nerve block,[5] radiological(selective transcatheter embolization therapy) and surgical (arterial ligation or shunts)

Stepwise approach to priapism has been recommended starting with intracorporeal aspiration of blood as the first line therapy.

Glycopyrrolate being a quaternary ammonium compound does not cross the blood brain barrier so is preferred because of its stable central nervous and cardiovascular profile. The use of intravenous glycopyrrolate to treat intra operative penile erection in patient under spinal anesthesia suggests a parasympathetic cholinergic etiology. Hence because of safety profile and easy availability we decided to use this drug.[14]

Phenylephrine, 3 hydroxyphenylethylamine, is a synthetic non catecholamine. It exerts vasoconstrictive effect on smooth muscle. The pure alpha 1 agonistic activity lacks adverse cardiac effects such as hypertensive crisis or pulmonary edema. This makes it a safer drug when compared to epinephrine, norepinephine, which has additional beta 1 action responsible for the adverse systemic and cardiac effects.[13]

Alpha agonist like terbutaline for oral administration may be taken into consideration but hypertension and cardiac arrhythmia could assert a limiting effect.

Ketamine causes detumescence through its dissociative effect on the limbic system which leads to penile relaxation. Though it is used invariably, complete detumescence requires a long time. Its propensity to cause hallucination and emergence delirium was one of the major drawback.[10,11]

Intravenous propofol have also been advocated in the past for treatment of intra operative priapism but there are few cases of propofol associated priapism as well. The exact mechanism is not well understood but it has been implicated to cause nitric oxide mediated smooth muscle relaxation and increase in parasympathetic activity.[15]

Dorsal penile block is relatively safe and effective in relieving priapism where other methods have failed.[5] It blocks the sensory supply to the penis.

4. Conclusion

Priapism is a urological emergency and treatment must be initiated at the earliest to facilitate venous drainage of the engorged corpora cavernosa as prolonged venous stasis may leads to increased viscosity, slugging and ultimately leading to fibrosis and thrombosis. Intracorporeal injection of phenylepherine is very effective and relatively safe option among other alpha agonist, so we believe that it should be considered early amongst other advocated therapies unless contraindicated.

5. Source of Funding

None.

6. Conflict of Interest

None.

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Cite this article: Bhutia TP, Pradhan N, Bhutia TD, Rajni, Bhutia SD. Management of intra operative priapism after spinal anesthesia with intravenous glycopyrrolate and intracorporeal injection of ultra low dose of phenylephrine- A case report. *Indian J Clin Anaesth* 2021;8(2):349-351.