THE EFFECT OF ISCHEMIC PRIAPISM MANAGEMENT ON ERECTILE FUNCTION: A PROSPECTIVE STUDY

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Objectives

1. Introduction of priapism.
2. Types of priapism.
3. Causes of ischemic priapism (IP).
4. Aim of the study.
5. Patients.
6. Methodology of the study.
7. Preliminary Results.
8. Preliminary Conclusion.
Priapism takes its name from god Priapus who is the symbol of virility and fertility in ancient Greek culture and was constantly in the state of erection. (1)

Priapism is defined as a prolonged and persistent penile erection that is unrelated to sexual interest or stimulation and lasts more than 4 hours in duration.

The incidence of priapism in the general population is low (0.5–0.9 cases per 100,000 person-years). (2)

**Introduction of priapism.**

Currently, there are three accepted subtypes:

1. ischemic or low flow or venous priapism.
   - 95% of all priapism cases, is the most common type and it is an emergency. 
   - marked by rigidity of the corpora cavernosa (cc) and little or no cavernous arterial inflow. (3)

2. non-ischemic or high-flow or arterial priapism.
   - caused by unregulated cavernous arterial inflow (3)
   - erection that is not fully rigid and not associated with pain.

3. stuttering or intermittent or recurrent priapism.
   - Which is a distinct condition characterized by repetitive, painful episodes of prolonged erections, erections are self-limited with intervening periods of detumescence. (4)
   - the duration of the erectile episodes in stuttering priapism is generally shorter than in the low-flow ischemic type. (5)
1. Idiopathic in the majority of cases. (4,7)
2. Haematological dyscrasias, mostly sickle cell disease
   - it is the primary aetiology in 23% of adult cases,
   - lifetime probability of developing ischaemic priapism of 29-42% in men with sickle cell disease
3. Ischaemic priapism may occur (0.4-35%) after intracavernous injections of erectogenic agents. The risk is higher with papaverine-based combinations, while the risk of priapism is <1% following prostaglandin E1 injection. (7)
4. Use of a number of pharmacological agents which includes few cases of priapism have been described in men who have taken PDE5Is. (8-11)
5. Neoplastic syndromes, priapism resulting from metastatic or regional infiltration by tumour is rare and usually reflects an infiltrative process. (11)

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**Ischemic priapism: causes**

1. Idiopathic in the majority of cases. (4,7)
2. Haematological dyscrasias, mostly sickle cell disease
   - it is the primary aetiology in 23% of adult cases,
   - lifetime probability of developing ischaemic priapism of 29-42% in men with sickle cell disease
3. Vasoactive erectile agents (i.e., papaverine, phentolamine, prostaglandin E1/alprostadil, combination of intracavernous therapies)
4. α-adrenergic receptor antagonists (i.e., prazosin, terazosin, doxazosin, tamsulosin)
5. Anti-anxiety agents (hydroxyzine)
6. Anticoagulants (heparin, warfarin)
7. Antidepressants and antipsychotics (i.e., trazodone, bupropion, fluoxetine, sertraline, lithium, clozapine, risperidone, olanzapine, chlorpromazine, thioridazine, phenothiazines)
8. Antihypertensives (i.e., hydralazine, guanethidine, propranolol)
9. Hormones (i.e., gonadotropin-releasing hormone, testosterone)
10. Recreational drugs (i.e., alcohol, marijuana, cocaine [intranasal and topical], crack, cocaine)

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Aim of the work.

- The aim of this work is to prospectively evaluate the long term effect of the current management of ischemic priapism on future erectile function.

- Applying a standard protocol of management in emergency service by the urologist for the ischemic priapism patients in the urology department of Alexandria main university hospital.

 Patients

- 30 patients with ischemic priapism were hospitalized in the urology department of Alexandria main university hospital after applying standard protocol of management in emergency service by the urologist.

- Protocol of management is applied to patients of ischemic priapism whatever is the duration of IP.

- Patients were told to comply with all recommended treatment and informed of the potential consequences.

- exclusion criteria:
  - Age < 20 years.
  - High flow priapism (non-ischemic).
Methodology of the study.

**pre-procedure:**

1. **history:** all patients were evaluated preoperatively by:
   - complete history taking including age, residency, drug history, family history of similar conditions, sexual activity, any sexual disorders as ED.
   - complete history of presenting condition
   - baseline erectile function by international index of erectile function (IIEF-5) questionnaire

2. **clinical examination:** all patients were evaluated preoperatively by:
   - complete general physical examination.
   - complete local physical examination: inspection and palpation of the penis will be done to determine the extent of tumescence and rigidity; the presence of tenderness; the evidence of trauma to the perineum, penile hardness, perineal swelling or hematoma, and assess associated local ischemic manifestations.

3. **investigations:** all patients were evaluated preoperatively by:
   - complete blood count (CBC) and coagulation profile to assess anaemia
   - the type of priapism will be assessed by:
     - corporeal blood gases (color of aspirated blood, pH, O₂ tension (pO₂), CO₂ tension (pCO₂) and glucose level)
     - penile doppler without injection of a vasoactive material will be used when the diagnosis cannot be made by corporeal blood gases
Procedure:

- Insert wide bore butterfly or cannula (16-18 G) through the glans into the corpora cavernosa (under anesthesia)
- Aspirate cavernosal blood until bright red arterial blood is obtained

Intracavernosal therapy

- Inject intracavernosal adrenoceptor agonist which is phenylephrine with 300-500 μg per injection, being injected every 3-5 minutes until detumescence is achieved (maximum dose of phenylephrine is 1 mg within 1 hour)

- In case of priapism recurrence after aspiration and intra-cavernous injection of a sympathomimetic drug, the previous steps are repeated up to three times before considering surgical intervention
- Surgical treatment will be done only when blood aspiration and intra-cavernous injection of sympathomimetic drugs have failed for three times. Clinical signs suggesting failure of conservative treatments (e.g., corporal rigidity by examination, acidosis, and hypoxia by cavernous blood gas testing or absence of cavernosal artery inflow by penile Doppler without injecting vasoactive material which essential before shunts).

- Distal T-shunt (LUE et al., 2003) procedure with or without tunnelling are tried first, if failed then the open proximal corporeal shunts will be performed. Proximal shunting and corporeal dilation will be considered if distal procedures have failed to relieve the priapism
Post-procedure:

- Before discharging patients for follow up in the outpatient clinic, **penile Doppler without injection of a vasoactive material will be used to confirm the effectiveness of IP management** by determining the peak systolic velocity (PSV) and end diastolic velocity (EDV) in both corporal cavernosal arteries (cavernosal artery inflow)
- All patients will receive pentoxifylline (trental), aspirin and chronic pde5i (tadalafil 5 mg).
- Follow-up will be done at outpatient service. All patients will be monitored at 1 month, 3 and 6 month’s post-operative by:
  1. History taking with special focus on pain, morning erections, confidence to get and maintain an erection, hardness of erection, ability to penetrate (enter partner), ability to maintain erection during intercourse, ability to complete intercourse till ejaculation and how was the intercourse satisfactory.
  2. Clinical examination of penis.
  3. Assessment of degree of erectile function and sexual function post-operative by using the international index of erectile function questionnaire (IIEF-5) at 6 months post procedure.
  4. To determine the Need of on demand PDE5i or not.
  5. Penile Doppler with injecting vasoactive materials to detect distal penile arterial blood flow or venous leakage if the patient complain from erectile dysfunction.
  6. Penile MRI when needed.

PRELIMINARY RESULTS.

- Our preliminary results shows that:
  1. **Positive strong association** between IP and drug addiction (cannabis smoke, tramadol drug addicts)
  2. **Positive strong association** between IP and antidepressants & antipsychotics (trazodone, bupropion, fluoxetine, sertraline, clozapine, risperidone, olanzapine, chlorpromazine, thiorizadine, phenothiazine's)
  3. Phenylephrine injection intra-cavernosal is a good vasoconstrictor to achieve complete detumescence.
  4. Many IP patients lasting more than 24 hours before management have achieved complete detumescence after applying single or repeated aspirations & ICI of phenylephrine.
  5. Many IP patients lasting more than 24 hours before management had good erectile function on assessment 6 months after applying single or repeated aspirations & ICI of phenylephrine.
  6. Concomitant pyeronies and priapism can happen and mostly associated with ED.
  7. Most of Patients **but Not all** who had performed distal -T-shunt or proximal shunts had the worst IIEF5 score.
  8. Proximal shunting is rarely required after performing dital shunts in recently proposed algorithm.
All IP patients may have trials of aspiration & ICI before performing surgical intervention. **regardless the duration** of the priapism which can achieve complete detumescence.

Proper management of IP & close follow up can achieve good erectile function regardless the duration of IP.

Pentoxifylline (trental), aspirin and chronic pde5i (tadalafil 5 mg) are proven to be effective in preservation of erectile function.

Phenylepherine is the best alpha agonist to be injected intra-cavernosally which achieved detumescence in most of cases.

Penile Doppler without injection of a vasoactive material assessing penile vascularity after aspiration is essential before performing shunts.

- Priapism lasting more than 48 hours we shouldn’t just throw in the towel and give up and just go ahead for shunt procedures.
- Penile gangrene post IP is very rare.
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