

Erectile Function and Dysfunction Following Low Flow Priapism

A comparison of Distal and Proximal Shunts

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Purpose: To compare erectile function following low flow priapism in patients undergoing distal and proximal shunts.

Materials and Methods: From January 1995 to December 2005, we retrospectively studied 16 patients who presented to our medical center with refractory priapism. Of 16 patients, 5 underwent Winter shunt, while El-Ghorab procedure was performed for 7 patients and the remaining 4 underwent Grayhack shunt. Erectile function was assessed in a minimum follow-up of 2 years (range, 2 to 10 years) using erectile dysfunction (ED) intensity scale [Total score: 5 to 10 (severe ED); 11 to 15 (moderate ED); 16 to 20 (mild ED); and 21 to 25 (no ED)].

Results: The mean patients' age was 40.62 ± 15.27 years. Mean duration of priapism was 51.12 ± 37.99 hours. Of 4 patients (25%) who underwent proximal shunt (Grayhack procedure), 2 (50%) were impotent, 1 had potency, and the other one achieved some penile erection with administration of oral sildenafil. Of 5 patients (31.25%) who underwent Winter procedure, 1 died because of metastatic bladder cancer and of 4 remainders, 2 (50%) had normal erectile function, but 1 patient suffered from recurrent priapism. Of 7 patients (43.75%) who underwent El-Ghorab procedure, 1 was lost for follow-up and of remaining 6 patients, 2 (33.3%) had normal erectile function and 4 (66.6%) were impotent. No surgical complication was seen. Median lag time from priapism till surgery for patients with and without ED was 48 and 26 hours, respectively ($P = .22$).

Conclusion: Grayhack shunt is a safe surgical procedure without any major complications and with lower ED rate. Grayhack shunt might be considered as treatment of choice for refractory low flow priapism.

Keywords: priapism, erectile dysfunction, impotency, surgery

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INTRODUCTION

Priapism is a painful and persistent erection that is not associated with sexual excitement or desire, and does not subside after sexual intercourse or masturbation.⁽¹⁾

Priapism can be categorized as low flow (ischemic) and high flow (non-ischemic) types. Low flow priapism is a urological emergency,

similar to compartment syndrome. If left untreated, low flow priapism can cause necrosis and fibrosis of the cavernous tissue and lead to impotence. Incidence of impotence is directly related to the duration of priapism and aggressiveness of treatment. However, between 50% to 90% of patients will develop erectile dysfunction if the priapism

lasts more than 24 hours.⁽²⁾

Adequate evaluation to identify the cause and type of priapism is essential before initiation of therapy. The therapeutic goals are to avert the unwanted erection, relieve pain, and preserve potency.⁽¹⁾ It is stated that low flow priapism of particularly extended durations, such as 48 to 72 hours, is unlikely to be resolved with intracavernous treatment, and surgical shunting should be rapidly performed.⁽³⁾

For distal shunting, creating a corporoglanular shunt using scalpel or needle core biopsy technique of Ebbelhøj or Winter is the first reasonable approach.⁽³⁾ El-Ghorab procedure is considered as the most effective distal shunt, but it is a more invasive open surgical modification of this type of shunting maneuver.⁽³⁾ Proximal shunting by making a window between the corpus cavernosum and corpus spongiosum or by anastomosis of the saphenous vein to one of the corpora cavernosa (Grayhack shunt) may be warranted if distal shunting fails.^(4,5)

The purpose of this study was to evaluate erectile function following distal and proximal shunts in long-lasting priapism management.

MATERIALS AND METHODS

We retrospectively studied 16 patients who referred to our medical center complaining of priapism during the past 10 years (from January 1995 to December 2005), all of whom underwent shunting procedure.

The etiologies of priapism are demonstrated in Table. In 10 patients (62.5%), priapism had occurred during nocturnal penile tumescence. All of the 16 patients had had low flow priapism documented by gasometric estimation of the

Etiologic factors of priapism

Etiologic Factor	No	Percentage
Opium addiction	2	12.5%
History of recurrent priapism	5	31.25%
Smoking	4	25%
Intracavernosal injection of vasoactive agents	4	25%
Psychologic problems	2	12.5%
Alcohol consumption	6	37.5%
Metastatic cancer	1	6.25%

intracavernosal blood and had been refractory to conservative management, including evacuation of the blood and irrigation of the corpora cavernosa with intracavernous injection of an alpha adrenergic sympathomimetic agent.

Of 16 patients, 5 underwent Winter shunt, while El-Ghorab procedure was performed for 7 patients and the remaining 4 underwent Grayhack shunt, based on surgeon's decision (Figures 1-3). Relevant data were gathered from clinical records. All of the patients were followed up for a minimum period of 2 years (range, 2 to 10 years). Erectile function was assessed by erectile dysfunction intensity scale [Total score: 5 to 10 (severe ED); 11 to 15 (moderate ED); 16 to 20 (mild ED); and 21 to 25 (no ED)].⁽⁶⁾

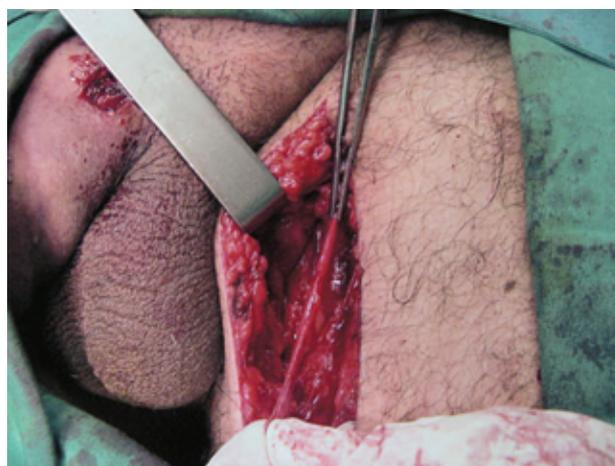


Figure 1. Identification of the saphenous vein in the medial aspect of the thigh.



Figure 2. Creating a submucosal tunnel from the thigh to the lateral aspect of the corpus cavernosum.



Figure 3. End to side anastomosis of the saphenous vein to the corpus cavernosum.

RESULTS

The mean patients' age was 40.62 ± 15.27 years (range, 19 to 65 years). Mean duration of priapism was 51.12 ± 37.99 hours (range, 4 to 120 hours).

Of 16 patients, 4 (25%) underwent proximal shunt (Grayhack procedure), of whom 2 (50%) had severe ED, 1 was potent (normal erectile function), and the other one had some penile erection with administration of oral sildenafil (mild ED).

Five patients (31.25%) underwent Winter procedure, of whom 1 died because of metastatic bladder cancer. Of 4 remainders, 2 (50%) had normal erectile function, but 1 experienced recurrent priapism. Remainders in this group had severe ED.

Of seven patients (43.75%) who underwent El-Ghorab shunt, 1 left the follow-up and of remaining 6 patients, 2 (33.3%) had normal erectile function and 4 (66.6%) suffered from severe ED.

No surgical complication was observed in our series. Median time to surgery in subjects with and without ED was 48 and 26 hours, respectively ($P = .22$ with Mann-Whitney U test). Median time to surgery for patients with proximal shunt, El-Ghorab, and Winter procedure was 51, 26, and 34 hours, respectively.

DISCUSSION

One of the main goals in treatment of priapism is to maintain potency. The purpose of our study was to evaluate the relationship between the type of surgical shunts and postoperative erectile function.

In a study on 26 patients undergoing proximal shunt (Grayhack), only 7 patients (26.92%) were potent postoperatively.⁽⁷⁾ Moncada treated 5 patients with low flow priapism using Grayhack procedure. He concluded that when erectile capacity does not restore within 3 months postoperatively, then the shunt should be ligated.⁽⁸⁾ In another study, Chen and colleagues reported 1 patient who underwent Winter procedure and was potent in a 1-year follow-up.⁽⁹⁾

In a study by Nixon and associates, 28 patients were evaluated retrospectively. Thirteen patients (46.4%) required more than one operation for failed detumescence, of whom 12 (92.3%) initially had undergone a Winter shunt. Of 20 men who completed the follow-up period, only 2 patients (10%) reported preservation of pre-operative erectile function. Three patients (15%) achieved some erection without the prescription of vasoactive agents. Approximately, 50% of the subjects required re-operation for failed detumescence following a cavernoso-spongiosum shunt in their experience. Winter shunt was the least successful operation whereas re-operation was uncommon following El-Ghorab or Quackles shunt.⁽¹⁰⁾

About 90% of patients in the above mentioned study had ED during follow-up period. They concluded that ED after shunting procedure may be a direct consequence of the prolonged priapism itself.⁽¹⁰⁾ In our study, 2 (50%), 2 (50%), and 2 (33.3%) of the patients who underwent proximal shunt (Grayhack), Winter procedure, and El-Ghorab shunt had satisfactory erectile function, respectively. Overall potent patients with proximal shunt were 50% in comparison to 40% for distal shunts (Winter and El-Ghorab).

Complications such as urethral fistulas, purulent cavernositis, and pulmonary embolism have been reported after various shunt procedures. Since most shunts appear to close over time,

it is thought that shunting does not produce permanent ED. However, persistence of a shunt resulting in ED has been reported.⁽¹¹⁾ Erectile dysfunction following shunting procedure might be due to adverse effects of prolonged priapism and type of shunting (distal or proximal), and the procedure itself does not seem to play an important role in postoperative erectile function.

Our findings suggest superiority of proximal shunt in management of low flow priapism. It has lower or at least equal impotence rate compared to distal shunts. This is especially true in patients who had undergone distal shunt or those with prolonged and refractory priapism. Previous concerns about complications and higher rate of ED following proximal shunts should be re-evaluated.

Our study has some limitations. Patients with different age groups, etiology, and priapism duration were enrolled in this study. Therefore, drawing final conclusion about a special surgical method cannot be made based on our study. There is no doubt that a well-designed prospective study will find out the correlation between shunting procedures, duration of priapism, and following ED.

CONCLUSION

Grayhack shunt is a safe surgical procedure without any major complications and with lower ED rate compared to distal shunts. Grayhack shunt might be considered as an appropriate and effective technique in the first line management of refractory low flow priapism.

CONFLICT OF INTEREST

None declared.

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