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Emergency Department Evaluation of Priapism: Etiology and Consultation

Frederick Fiesseler, Renee Riggs, Dave Salo, Claire DeLong, and Brian Walsh

ABSTRACT

Introduction: **Priapism is a time-critical condition requiring immediate evaluation and management to avoid significant sequela. Management of this condition is significantly variable, dependent upon the underlying cause, and often instituted by a consultant rather than the treating emergency physician.**

Objectives: **To determine etiologic factors contributing to priapism treatment and determine if treatments initiated in the emergency department (ED) contribute to an improved disposition metric.**

Methods: **We conducted a multi-center, retrospective study of patients with priapism caused by multiple different etiologies. Study subjected were located at 15 hospitals by chart review and conducted a computer-assisted chart review to locate patients with priapism for each hospital over a 2-year period.**

Results: **We evaluated 236 patients during the study period; 8 excluded for chart unavailable and 6 with non-priapism diagnosis on review. Median age was 39 years (IQR 22-52). Pediatrics, defined as less than 21 years of age, comprised 4% of patients (N=9). Overall, 85% (N=188) were discharged. Erectile dysfunction medications (EDM) were the most common identifiable cause; involving 23% (N=52). The remaining were sickle cell 20% (N=45), antipsychotic medications 14% (N=30), cocaine 2% (N=4), the remainder without an identifiable etiology. Overall, intrapenile procedures occurred in 56% (N=125) of patients. EDM was associated with significantly less intrapenile procedures compared to other etiologies, 15% (N=58) (p = 0.009), and also had a 2% (N=1) admission rate, significantly less compared to other etiologies (p=0.009). Further, consulting urology did not significantly increase mean length of stay, with difference of 19 minutes (p=0.64) when compared to ED intervention alone.**

Conclusion: **Priapism as a result of EDM, the most frequent etiology, was associated with less frequent emergent intrapenile procedures and significantly less admissions and urology consultation does not significantly lengthen disposition times.**

Keywords: Erectile dysfunction, injection, priapism, urology.

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F. Fiesseler
Morristown Medical Center, USA.
(e-mail: ffiesseler@yahoo.com)
R. Riggs
Robert Wood Johnson University Hospital, USA.
(e-mail: reneeriggs@yahoo.com)
D. Salo
Morristown Medical Center, USA.
(e-mail: ds1122@aol.com)
C. DeLong*
Morristown Medical Center, USA.
(e-mail: claire.delong@atlantichealth.org)
B. Walsh
Morristown Medical Center, USA.
(e-mail: briwalsh10@aol.com)

****Corresponding Author***

I. Introduction

During the years of 2006 to 2009, 8,738 ED patient encounters were found in the Nationwide Emergency Department Sample [1]. This is an incidence from 0.34 to 1.5 cases per 100,000 males. There are 3 categories of priapism: ischemic, non-ischemic, and stuttering. Ischemic, also known as veno-occlusive or low flow, with minimal cavernous arterial inflow and marked rigidity of the corpora cavernosa [2]. Research has shown that ischemic priapism for greater than 24 hours can cause erectile dysfunction complications as high as 90% [3]. Non-ischemic, on the other hand, are also known as arterial or high flow priapism [2]. It most commonly is the result of trauma leading to an arteriolar-sinusoidal fistula. The corpora are tumescent but not rigid, and typically is not painful and with continuous arterial flow that does not result in ischemia. Stuttering is an intermittent or recurrent ischemic priapism, typically lasting less than 4 hours. However, with increasing frequency and duration, they lead to the same result as ischemic priapism.

The consequences of priapism are associated with significant morbidity-socioeconomic, psychological, and physical, including immense pain and permanent erectile dysfunction. Further, treatment of priapism in the ED is varied, but expensive. It is reported that $1,778 was the average charge per encounter for a patient discharged home, and if admitted costs grew to an average of $41,909 [1]. Factors which contribute to increased cost include procedures performed, length of stay, and whether a specialist is consulted.

With healthcare reform at the top of current headlines, reducing patient cost while providing effective care is

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important. We sought to identify the results of patients who presented to the ED with priapism based upon the suspected cause, the management used for these patients, and to determine whether bedside urology consultation for intrapenile injection/drainage increased ED length of stay compared to when the emergency physician performed the procedures.

II. Methods

The study utilized a multi-center retrospective cohort design. Patients were found over a two-year period at 15 hospitals who presented with priapism. These hospitals included both urban and suburban academic and non-academic facilities in New jersey. Additionally, the departments included in this study used electronic health records. Patients were identified using an ICD-9 code search for priapism, 607.3. After records were identified, a computerized search was used to identify cases by underlying cause: erectile dysfunction medications, sickle cell disease, antipsychotic medications, cocaine, and idiopathic.

Encounters were excluded if final diagnosis was not priapism or if the chart was unavailable. Patients were defined as pediatric if less than 21 years of age. Intrapenile procedures include any bedside aspiration/injection of medication. Combined aspiration and injection were considered a single combined intrapenile procedure. The statistics used were a Chi-square test with a significant P-value of less than 0.05. Additionally, a Mann-Whitney-Wilcox test, with a predetermined significant P-value of less than 0.05, two tailed, was utilized. This study was approved by the Institutional Review Board.

III. Results

Between 2012 to 2014 there were 236 patients with an ICD9 of 607.3 entered and 222 fit the inclusion criteria. 8 were excluded because of chart unavailability. Six additional charts were excluded after review revealed a final diagnosis not related to priapism. The median patient age was 39 years (IQR 22-52). Pediatric patients were 4% of total patients (N=9). Greater than 1 visit was recorded in 8% of the patients (N=18). With regards to etiology (Fig. 1), EDMs were the most common identifiable cause, involving 23% (N=52), with 75% (N=39) attributed to intrapenile medications. Sickle cell was found to be the cause in 20% (N=45) of patients, antipsychotic medications 14% (N=30), and cocaine usage comprised 2% of encounters (N=4). While the majority of cases had an identifiable contributor, 41% (N=91) had no identifiable etiology. Of the 222 patients, 15% (N=34) required admission.

Adrenergic medication was the most common treatment modality utilized. It was used in 63% of cases (N=140). Opioids were provided to 49% of patients (N=104). Intrapenile injections in 46% (N=103), cavernous drainage 29% (N=64), and exchange transfusion 0% (N=0).

Fifty-six percent (N=125) of patients had intrapenile procedures performed. Fifteen percent (N=8, P<0.009) of EDM patient encounters received intrapenile procedures, whereas 42% (N=19, p=0. 08) with sickle cell, 67% (N=22, p=0.7) on antipsychotics, or 50% (N=2, p=0.06) of users required emergent intrapenile treatment. Overall, 7% (N=16) required emergent operation. Surgery occurred in 2% (N=1) (p=0.38) of EDM, 10 % (N=3) (p=0.59) antipsychotics and did not occur with cocaine or sickle cell patients.

A urology consult was obtained in 77% (N=170) of patient encounters. A urologist arrived and evaluated the patient at bedside in the ED 52% (N=115) of time. Of the 103 intrapenile injections, urology performed 56 % (N=58) and 70 % (N=45) of cavernous drainages. Mean disposition time for those who had a urology consultation in ED was 308 minutes. Whereas ED physician-initiated procedures and evaluation had a mean disposition time of 289 minutes, with a difference of 19 minutes (p=0.64) less when compared to specialist consultation.

Patients with EDM were admitted at a rate of 2% (N=1, p=0.009). Sickle cell patients had an admission rate of 20% (N=9, p=0.43). Encounters with antipsychotic medication as the cause were admitted at a rate of 13% (N=4, p=0.77), and cocaine associated cases admitted 50% (N=2, p=0.06) of the time. Nineteen percent (N=18) of etiology unknown patients required admission (Fig. 2).

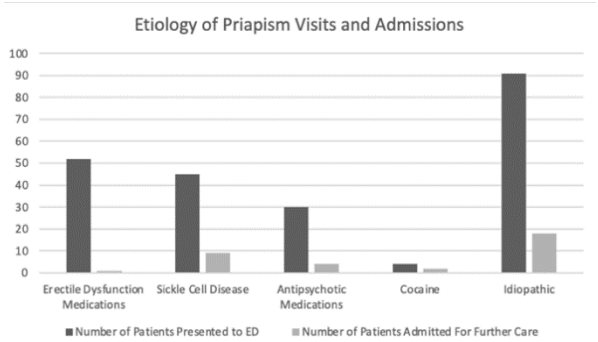

Fig. 1. Etiology of priapism visits and admissions.

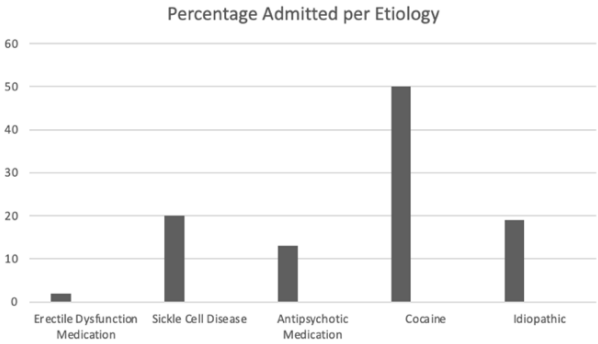

Fig. 2. Percentage admitted per etiology.

IV. Discussion

There are limited clinical trials that identified the optimal treatment for priapism. There have been many management strategies tried in small studies, however, there has not been a standardized approach for prevention or treatment in SCD [3]. Reference [4] completed one of the few prospective studies conducted on priapism in SCD, it included 15 boys and adolescents with priapism that had been present for less than 24 hours prior to initial presentation in the ED. They received penile aspiration followed by a 10 mL injection of a 1:1,000,000 solution of epinephrine. This was followed by perpetual aspiration until detumescence occurred. There was

a 95 percent success rate when this was done [4].

Priapism in SCD patients is often recurrent and intrapenile procedures are exceptionally painful. Patients should be counseled on non-invasive measures to help improve the outcome. These management strategies consist of increasing oral fluid intake, the use of oral analgesics, and attempting to urinate as quickly as possible when priapism begins. Some have also suggested that exercise, warm compresses, and masturbation may also be beneficial. Implementation of these practices, as well as IV hydration while in the ED, may allow for detumescence prior to intrapenile procedures.

Erectile dysfunction medications, the most common identifiable cause in this study, may not require interventions for resolution. The most common medications on the market are Stendra (avanafil), Viagra (sildenafil), Cialis (tadalafil), and Levitra (vardenafil). The half-life for these medications is 4-5 hours, with Cialis being the outlier at 17.5-hour half-life. This may explain why EDMs resulted in fewer interventions and fewer admissions. Supportive care and time may be all that is needed for the patient's body to remove the offending medication from the system.

However, for those that require them, intrapenile procedures are well within the scope of practice for emergency physicians. As discussed earlier, ischemic priapism is a medical emergency and interventions should be done in a timely fashion. However, we have found that consultation and urologic intervention does not significantly delay disposition for this patient. As resources are available, discussion with urology is appropriate.

V. Limitations

Data was collected from urban and suburban hospitals in both academic and community settings. The availability of specialists, such as urologists, is significantly different to that of rural practices. The application of disposition time in conjunction with urology intervention may not be appropriate for rural settings.

We did not perform confirmatory testing to ensure etiology validity. Substance use was self-reported and coded. However, [5] recently reported that substance abuse is grossly under reported, with 43.8% agreement between self-report and biochemical testing for cocaine alone. This may account for the large portion of cases which were idiopathic.

Repeat encounters were identified during the study period. However, events prior to the 2-year study period were not known. Prior experience with priapism, particularly in SCD, may allow for interventions prior to ED arrival which may impact the ED's course of care.

VI. Conclusion

Priapism caused by EDM, the most common known etiology, was associated with significantly less emergent intrapenile procedures and significantly less admissions and urology consultation does not significantly lengthen disposition times.

Conflict of Interest

Authors declare that they do not have any conflict of interest.

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