THE JOURNAL of UROLOGY®
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AUA Guideline Article

Acute Ischemic Priapism: An AUA/SMSNA Guideline

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Purpose: Priapism is a persistent penile erection that continues hours beyond, or is unrelated to, sexual stimulation and results in a prolonged and uncontrolled erection. Given its time-dependent and progressive nature, priapism is a situation that both urologists and emergency medicine practitioners must be familiar with and comfortable managing. Acute ischemic priapism, characterized by little or no cavernous blood flow and abnormal cavernous blood gases (ie, hypoxic, hypercarbic, acidotic) represents a medical emergency and may lead to cavernosal fibrosis and subsequent erectile dysfunction.

Materials and Methods: A comprehensive search of the literature was performed by Emergency Care Research Institute for articles published between January 1, 1960 and May 1, 2020. Searches identified 2948 potentially relevant articles, and 2516 of these were excluded at the title or abstract level for not meeting inclusion criteria for any key question. Full texts for the remaining 432 articles were reviewed, and ultimately 137 unique articles were included in the report.

Results: This Guideline was developed to inform clinicians on the proper diagnosis and surgical and non-surgical treatment of patients with acute ischemic priapism. This Guideline addresses the role of imaging, adjunctive laboratory testing, early involvement of urologists when presenting to the emergency room, discussion of conservative therapies, enhanced data for patient counseling on risks of erectile dysfunction and surgical complications, specific recommendations on intracavernosal phenylephrine with or without irrigation, the inclusion of novel surgical techniques (eg, tunneling), and early penile prosthesis placement.

Conclusions: All patients with priapism should be evaluated emergently to identify the sub-type of priapism (acute ischemic versus non-ischemic) and those with an acute ischemic event should be provided early intervention. Treatment of the acute ischemic patient must be based on patient objectives, available resources, and clinician experience. As such, a single pathway for managing the condition is oversimplified and no longer appropriate. Using a diversified

Abbreviations and Acronyms

AUA = American Urological Association
ED = erectile dysfunction
ICI = intracavernosal injection
MAOI = monoamine oxidase inhibitors
PDUS = penile duplex Doppler ultrasonography
SMSNA = Sexual Medicine Society of North America

Accepted for publication September 2, 2021.
The complete unabridged version of the guideline is available at https://www.jurology.com.
This document is being printed as submitted, independent of standard editorial or peer review by the editors of *The Journal of Urology*®.
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0022-5347/21/2065-0001/0
THE JOURNAL OF UROLOGY®

https://doi.org/10.1097/JU.0000000000002236
Vol. 206, 1-8, November 2021
Printed in U.S.A.

approach, some men may be treated with intracavernosal injections of phenylephrine alone, others with aspiration/irrigation or distal shunting, and some may undergo non-emergent placement of a penile prosthesis.

INTRODUCTION

Acute ischemic priapism (veno-occlusive, low flow) is a non-sexual, persistent erection characterized by little or no cavernous blood flow and abnormal cavernous blood gases (ie, hypoxic, hypercarbic, acidotic). As the natural history of untreated acute ischemic priapism includes days to weeks of painful erections followed by permanent loss of erectile function, the condition requires prompt evaluation and may necessitate emergency management. While less-invasive, stepwise methods may be appropriate for most situations, others may be best managed using expedited surgical interventions. The current Guideline addresses acute ischemic priapism with limited discussion of non-ischemic priapism. Sections on non-ischemic priapism, stuttering/recurrent priapism, and priapism in sickle cell populations will be included in an upcoming publication. The index patient used to establish recommendations in this Guideline was defined as an adult male presenting with a prolonged erection lasting >4 hours.

GUIDELINE STATEMENTS

Diagnosis of Priapism

1. **In patients presenting with priapism, clinicians should complete a medical, sexual, and surgical history and perform a physical examination, including the genitalia and perineum. (*Clinical Principle*)**
2. **Clinicians should obtain a corporal blood gas at the initial presentation of priapism. (*Clinical Principle*)**
3. **Clinicians may utilize penile duplex Doppler ultrasound when the diagnosis of acute ischemic versus non-ischemic priapism is indeterminate. (*Expert Opinion*)**
4. **The clinician should order additional diagnostic testing to determine the etiology of diagnosed acute ischemic priapism; however, these tests should not delay, and should be performed simultaneously with, definitive treatment. (*Expert Opinion*)**

The initial presentation of priapism often happens acutely and in the setting of an emergency department; thus, collaboration between emergency medicine physicians and urologic specialists is imperative to the provision of appropriate, timely care.

History

Understanding the history of the episode of priapism is important as history and etiology may determine the most effective treatment. Historical features that should be identified include the following:

- baseline erectile function
- duration of erection
- degree of pain
- previous history of priapism and its treatment
- use of drugs that might have precipitated the episode (Table 1)
- history of pelvic, genital, or perineal trauma, especially a perineal straddle injury
- personal or family history of sickle cell disease or other hematologic abnormality
- personal history of malignancies, particularly genitourinary malignancies

Examination

The genitalia, perineum, and abdomen should be carefully examined. In patients with priapism, the corpora cavernosa are typically affected, while the corpus spongiosum and the glans penis are not. Further, the corpora cavernosa are often fully rigid and tender, while men with non-ischemic priapism exhibit partial corporal tumescence (Table 2). Abdominal, pelvic, and perineal examination may reveal evidence of trauma or malignancy.

Corporal Blood Gas

Blood gas testing is the most common diagnostic method of distinguishing acute ischemic from non-ischemic priapism when the diagnosis cannot be

Table 1. *Drugs/Medications Associated with Priapism*

Drug class	Documented examples
Attention deficit hyperactivity disorder medications	Atomoxetine
Alpha-adrenergic blockers	Doxazosin, prazosin, tamsulosin, terazosin
Anticoagulants	Heparin, warfarin
Antidepressants/antipsychotics	Bupropion, chlorpromazine, clozapine, fluoxetine, lithium, olanzapine, phenothiazines, risperidone, sertraline, thioridazine, trazadone
Antihypertensives	Guanethidine, hydralazine, propranolol
Hormone therapy	Gonadotropin-releasing hormone, testosterone
Recreational drugs	Alcohol, cocaine, marijuana
Vasoactive erectile agents	Alprostadil, papaverine, phentolamine, prostaglandin E1, combination agents

Table 2. *Key Findings in the Evaluation of Priapism*

Finding	Ischemic Priapism	Nonischemic Priapism
Corpora cavernosa fully rigid	**U**	**0**
Penile pain	**U**	**0**
Abnormal cavernous blood gases	**U**	**0**
Blood abnormalities and hematologic malignancy	**S**	**0**
Recent intracavernosal vasoactive drug injections	**S**	**0**
Chronic, well-tolerated tumescence without full rigidity	**0**	**U**
Perineal trauma	**0**	**S**

0: Seldom present; **S**: Sometimes present; **U**: Usually present

made by history alone. Corporal blood gases in men with acute ischemic priapism typically have a PO2 of < 30 mm Hg, a PCO2 of > 60 mm Hg, and a pH $<$ 7.25. Cavernous blood gases in men with non-ischemic priapism are similar to the blood gases of arterial blood, while normal flaccid penis cavernous blood gas levels are approximately equal to those of mixed venous blood. Typical blood gas values are shown in Table 3.

In the majority of cases presenting acutely to the emergency department, a corporal blood gas should be obtained during the initial evaluation to diagnose the priapism subtype. However, there are certain clinical situations where a blood gas may be omitted at the clinician's discretion. Examples include priapism induced by in-office or at-home intracavernosal injection (ICI) therapies, cases of recurrent ischemic priapism (ie, sickle cell disease), or when the diagnosis is abundantly clear by history and examination alone.

Radiologic Evaluation

Radiologic imaging studies have demonstrated utility in the evaluation and management of priapism, though largely outside of the acute phase of presentation. As such, imaging studies should not be incorporated into the acute evaluation and management of priapism in the emergency department by non-urologist specialists.

Penile duplex Doppler ultrasonography (PDUS) is not the primary way to diagnose priapism; however, it may be utilized in less clearly delineated cases to differentiate between acute ischemic and non-ischemic priapism.

Laboratory Evaluation

A complete blood count is a routine test that may identify elevated white blood cell counts, potentially identifying cases where priapism is due to underlying malignancy (eg, leukemia). Among men with sickle cell disease, acute ischemic priapism is associated with lower hemoglobin and elevated lactate dehydrogenase, bilirubin, aspartate aminotransferase, reticulocyte count, white blood cells, and platelet counts.[1] Mean platelet volume and platelet and eosinophil counts may also be elevated in men

Table 3: *Typical Blood Gas Values*

Source	PO2 (mm Hg)	PCO2 (mm Hg)	pH
Acute ischemic priapism (cavernous blood)	<30	>60	<7.25
Normal arterial blood (room air)	>90	<40	7.40
Normal mixed venous blood (room air)	40	50	7.35

with acute ischemic priapism; while these laboratory values may contribute to the identification of underlying cause, they often will not be used to guide treatment of the acute presentation.[2]

Hemoglobin electrophoresis and other sickle cell testing may be appropriate in select clinical scenarios and based on underlying risk factors (eg, patient race). In most cases, men with sickle cell disease will have been diagnosed previously. As such, electrophoresis and other sickle cell testing should be reserved for select clinical scenarios. A reticulocyte count is often used in the evaluation and management of patients carrying a diagnosis of sickle cell disease during presentations of acute vaso-occlusive crisis and may be incorporated into the workup of these patients along with a complete blood count.

Screening for psychoactive drugs and urine toxicology may also be performed; however, it is notable that testing for potential substances such as psychoactive medications and drugs of abuse may have a high rate of false negativity, particularly with synthetic and otherwise altered versions of common illicit substances. Patient history alone may provide much of this information without needing to perform additional testing.

Initial Management of Acute Ischemic Priapism

5. **Clinicians should counsel all patients with persistent ischemic priapism that there is the chance of erectile dysfunction.** ***(Moderate Recommendation; Evidence Level: Grade B)***
6. **Clinicians should counsel patients with a priapism event >36 hours that the likelihood of erectile function recovery is low.** ***(Moderate Recommendation; Evidence Level: Grade B)***

Managing patients who present with acute ischemic priapism is considered a urologic emergency, and the clinician should not treat the patient conservatively. The patient with diagnosed acute ischemic priapism should be informed that the natural history of untreated acute ischemic priapism is possible permanent loss of erectile function and corporal fibrosis leading to penile shortening. Erectile dysfunction (ED) is the most significant complication in patients with prolonged acute ischemic priapism, and the likelihood of developing ED is related to the length of an acute ischemic priapism event.[3–5] Bennett and Mulhall

demonstrated that sickle cell patients with priapism of >36 hours had permanent ED with no men recovering erectile function,[6] and while the exact time point of irreversible smooth muscle loss is undetermined, it is recognized that smooth muscle edema and atrophy occur in as early as six hours.[3,4] As the duration of the priapism increases, patients may be refractory to first-line treatments, such as aspiration, with or without irrigation, and ICI with phenylephrine. In a patient with acute ischemic priapism >36 hours, surgical interventions, such as distal shunting with or without tunneling, may be required to achieve detumescence; it is unlikely the acute ischemic event will resolve with local aspiration and ICI therapy with phenylephrine alone.[3,4]

7. In patients presenting with a prolonged erection of four hours or less following intracavernosal injection pharmacotherapy for erectile dysfunction, clinicians should administer intracavernosal phenylephrine as the initial treatment option. (*Expert Opinion*)

In contrast to true acute ischemic priapism, prolonged erections, which are <4 hours in duration and occur following ICI pharmacotherapy for ED, are arguably much more common and may be managed differently than acute ischemic priapism.

Men with prolonged erections that are not fully rigid are less likely to later progress to acute ischemic priapism compared to those with fully rigid erections. As such, partial erections should not be counted towards the four-hour time criteria. Similarly, the specific medication used to achieve the erection is an important factor to consider. Men treated with alprostadil alone are less prone to progress to ischemic priapism compared to those treated with papaverine and phentolamine, which may counteract normal pathways of detumescence. Pain is also not likely a helpful indicator, as many men may experience pain relating to the injection medication or pain from full engorgement. Ultimately, clinical judgment is required to determine if any specific therapy is warranted versus additional observation.

Men with prolonged erections <4 hours who are deemed candidates for treatment should be considered for an injection of intracavernosal phenylephrine as a primary treatment option (Supplemental Materials A). Intracavernosal aspiration and irrigation are likely too aggressive for this specific clinical scenario to be used as a first-line therapy. However, persistent, prolonged erections may be considered for aspiration/irrigation if phenylephrine alone is unsuccessful (Supplemental Materials B).

8. In a patient with diagnosed acute ischemic priapism, conservative therapies (ie, observation, oral medications, cold compresses, exercise) are unlikely to be successful and should not delay definitive therapies. (*Expert Opinion*)

Acute ischemic priapism is a true time-sensitive emergency, and ineffective therapies that delay resolution are ill-advised. This remains true for events secondary to sickle cell disease, pharmacotherapy, or other etiologies. No evidence-based recommendations can be made on self-help strategies involving exercise, cool or warm compresses, oral hydration, or masturbation.[7] Likewise, oral pharmacotherapy is not recommended for management of acute ischemic priapism. Experts have highlighted that the minimal corporal blood flow characteristic of this condition would preclude efficacy of oral agents. Additionally, these drugs may place patients at risk, as seen with the numerous reports of toxicity from oral pseudoephedrine when used to treat priapism.[8,9]

Pre-Surgical Management of Acute Ischemic Priapism

9. Clinicians should manage acute ischemic priapism with intracavernosal phenylephrine and corporal aspiration, with or without irrigation, as first-line therapy and prior to operative interventions. (*Moderate Recommendation, Evidence Level: Grade C*)

Given the emergent nature of acute ischemic priapism, ICI with phenylephrine should begin as rapidly as possible following diagnosis (Supplemental Material A). Specifically, intracavernosal treatments should not be delayed due to other systemic therapies (eg, hydration, exchange transfusion) and may be administered concomitantly in most cases. When a decision must be made between systemic and intracavernosal treatments, intracavernosal therapy should take precedence in the majority of cases.

While efficacy has been reported for epinephrine and ethylephrine, the most frequently used agent is phenylephrine. As no other injectable agent has a comparable sample size within the literature, phenylephrine was compared to all other agents combined and found to have a 28% higher rate of detumescence, while the other agents appeared comparable to aspiration alone.[10–15] While use in this context is off-label, phenylephrine is recognized as the preferred agent of choice. It offers rapid onset and short duration of action. Alpha-1 selectivity is attractive for reducing the potential for adverse cardiovascular events.

In comparing outcomes data between combination therapy of aspiration, irrigation, and intracavernosal alpha adrenergics to alpha adrenergics alone, results appear to suggest greater resolution rates with combination therapy. Specifically, subsequent shunt surgery was required in 15-28% of patients who received combination therapy compared to 43-63% of patients who received intracavernosal phenylephrine without aspiration and saline irrigation.[6,14,16–18]

Clinicians treating ischemic priapism may elect to proceed with alpha adrenergics, aspiration with

saline irrigation, or a combination of both therapies, based on clinical judgment (Supplemental Material A and B). However, given the relatively high resolution rates, surgical shunting should not be performed until both alpha adrenergics and aspiration and saline irrigation have been attempted. Even in cases where preserved erectile function is unlikely, clinicians may elect to perform combined treatments to improve penile pain, if present.

10. In patients receiving intracavernosal injections with phenylephrine to treat acute ischemic priapism, clinicians should monitor blood pressure and heart rate. (*Clinical Principle)*

Given the alpha-adrenergic effect of phenylephrine, systemic absorption following intracavernosal administration raises concerns for adverse cardiovascular effects, possibly through coronary vasospasm. Blood pressure and heart rate monitoring is especially prudent in patients with a history of cardiovascular disease, hypertension, prior stroke, and those using medications such as monoamine oxidase inhibitors (MAOIs). Phenylephrine is a direct-acting sympathomimetic (alpha-1 selective) with end organ selectivity, and there are no reports of toxicity when used for priapism in men using MAOI. Potentiation of phenylephrine effects by prior administration of MAOI is most significant with use of oral phenylephrine, which is dissimilar from intracavernosal administration. When parenteral use of phenylephrine has been deemed necessary in patients on MAOI, recommendations have included use of low starting doses; as such, gradual dose escalation may be reasonable when treating priapism in men using these medications. Should blood pressure spike, this would be detected by monitoring and appropriate medical intervention could be performed.

Surgical Management of Acute Ischemic Priapism

11. Clinicians should perform a distal corporoglanular shunt, with or without tunneling, in patients with acute ischemic priapism who have failed pharmacologic intracavernosal reversal and aspiration, with or without irrigation. (*Moderate Recommendation, Evidence Level: Grade C)*

A surgical shunt should not be considered as first-line therapy. The decision to initiate surgery requires the failure of non-surgical interventions. However, deciding when to end non-surgical procedures and proceed with surgery will depend on the duration of the priapism. For acute ischemic priapism of extended duration, response to ICI of sympathomimetics becomes increasingly unlikely. Phenylephrine is less effective in priapism of more than 48-hour duration because ischemia and acidosis impair the intracavernous smooth muscle response to sympathomimetics.[19] Under such anoxic conditions, phenylephrine produces poorly sustained phasic contractile responses. In particular, injection of sympathomimetics after 72 hours offers a lower chance of successful resolution, and a surgical shunting procedure often is required to re-establish circulation of the corpora cavernosa.[20]

Accordingly, when non-surgical interventions fail, a distal corporoglanular shunt should be considered. The optimal type of distal corporoglanular shunt for the treatment of acute ischemic priapism has not been defined. Specifically, no studies have directly compared the various surgical approaches. The overwhelming majority of studies include small patient cohorts and are retrospective in nature, except for one prospective study that included 19 patients.[4]

Similarly, there are no studies comparing shunting alone versus shunting with tunneling. Four studies reporting on various distal shunts with corporal tunneling, including the Burnett snake maneuver, demonstrate generally high rates of immediate success at relieving priapism.[3,21–23] In five studies with pre- and post-treatment erectile function information, distal shunts, both with and without tunneling, demonstrate deleterious effects on erectile function. Use of tunneling, however, is associated with greater degradation of post-procedure erectile function compared to distal shunting alone.[3,4,21–23]

12. In patients with acute ischemic priapism who failed a distal corporoglanular shunt, clinicians should consider corporal tunneling. *(Moderate Recommendation, Evidence Level: Grade C)*

Distal corporoglanular shunts aim to relieve a compartment syndrome through evacuation of blood trapped within the corpora. As an adjunct to needle- or scalpel-based opening of the distal end(s) of the corpora, instrument passage (typically a dilator) into the corporal tissue has been used to further facilitate drainage and detumescence. This is referred to as 'tunneling' or 'snaking.' This concept of using surgical dilators to evacuate ischemic clotted blood from the proximal crura of the penis through a distal shunt aims to re-establish blood flow.

Pooled data suggest that the addition of tunneling may afford slightly higher rates of successful detumescence. However, the success rates of studies without tunneling are driven lower by the poor results seen with Winter's shunts. Analysis of the literature has shown that scalpel-based shunts (eg, Ebbehoj, Al Ghorab, Lue T Shunt) provide higher success than needle-based (ie, Winter's) shunts.[5,15,18,24–38] Another potential factor relevant to comparative success rates is duration of priapism

prior to the intervention of interest. In one study of patients managed with tunneling, detumescence was achieved in 100%, 34%, and 0% of cases treated before 24 hours, at or beyond 48 hours, and at or beyond 96 hours, respectively.[3]

While all distal shunts may be contributory to future erectile function, patient-related factors and duration of ischemia are confounders. Thus, it is unclear whether tunneling produces an insult detrimental to future ED that exceeds the risk of ischemic priapism itself. Complications including wound infections, fistula, skin necrosis, and gangrene have been reported for distal shunts, with and without tunneling, so it is unclear if the additional corporal disruption imparts greater risk.[28,39,40]

13. Clinicians should counsel patients that there is inadequate evidence to quantify the benefit of performing a proximal shunt (of any kind) in a patient with persistent acute ischemic priapism after distal shunting. (*Moderate Recommendation, Evidence Level: Grade C)*

Proximal shunts are optional for the surgeon based on clinical judgment and comfort level; however, it is the Panel's opinion that proximal shunting represents a historical procedure that has largely been replaced by distal shunts with tunneling procedures. There are several important clinical considerations in deciding on whether a proximal shunt is appropriate and should be performed. One key issue is the ability to determine if detumescence has been adequately achieved following distal shunting. In men with more prolonged cases of priapism (>24 hours), edema, ecchymoses, and induration are often indistinguishable from persistent priapism. A vascular study (such as a PDUS) or cavernosal blood gas should be performed prior to performing additional interventions (repeat distal or proceeding to proximal shunting).

The extent and rate of complications from proximal shunting is understudied and could potentially lead to significant comorbidities such as urethrocutaneous fistulae, urethral strictures, or other similar issues. A proximal shunt should only be considered after failure of more established, conservative procedures, including distal shunting with tunneling. In situations when surgeons are uncomfortable performing proximal shunts, or in the case of older patients or those with poor erectile function at baseline and men with priapism duration >72 hours, observation or placement of a penile prosthesis may be preferred in lieu of a proximal shunt.

Post-Shunting Management of Acute Ischemic Priapism

14. In an acute ischemic priapism patient with persistent erection following shunting, the clinician should perform corporal blood gas or color duplex Doppler ultrasound prior to repeat surgical intervention to determine cavernous oxygenation or arterial inflow. (*Moderate Recommendation, Evidence Level: Grade C)*

In cases where a patient is refractory to shunting, subsequent intervention may be necessary.[41] In this scenario, the clinician must perform a confirmatory test to assess penile hemodynamic characteristics and extent of necrosis/fibrosis to inform secondary treatment decisions[41,42] and should not base further surgical decisions on exam alone. The Panel acknowledges this is a complex scenario; therefore, corporal blood gas or imaging should be utilized following shunt procedures to differentiate persistent ischemic priapism from reactive hyperemia or conversion to non-ischemic priapism. Penile corporal blood gas is easily performed by all clinicians and should be utilized in patients when the clinician must establish cavernosal oxygenation status post-shunting. This can help with decision-making in proceeding to additional surgical procedures including placement of an immediate penile prosthesis.

In a diagnosed acute ischemic priapism patient who has undergone a distal shunt, with or without tunneling, post-procedural imaging can determine shunt patency by showing restoration of cavernosal arterial inflow. A study by Chiou et al.[41] retrospectively reviewed charts of 24 patients who presented with priapism, 11 of whom were referred from other institutions and were refractory to previous aspiration and ICI therapy (n=2), distal (n=8), or proximal (n=1) shunts. PDUS at presentation showed no detectable cavernosal arterial flow in any of the patients, verifying earlier interventions had failed. However, PDUS can be difficult to interpret[43] and may be inaccurate for acute ischemic priapism patients, especially in the acute setting when qualified personnel with appropriate expertise are lacking.

Penile Prosthesis

15. Clinicians may consider placement of a penile prosthesis in a patient with untreated acute ischemic priapism greater than 36 hours or in those who are refractory to shunting, with or without tunneling. (*Expert Opinion)*

Although most reported cases of acute ischemic priapism resolve with bedside management, some will require surgical intervention. Shunting, with or without tunneling, may provide detumescence for many patients, but some will be refractory. Even when patients respond to shunting, they will often experience impotence secondary to ischemia and resultant fibrosis, and potentially from the surgical

intervention(s) as well. Men in need of detumescence for pain relief and those hoping to optimize erectile performance in the future can be considered for placement of a penile prosthesis.

Decisions regarding placement of a penile prosthesis in a patient with acute ischemic priapism must be made after weighing multiple factors. These include, but are not limited to, the quality of the history provided relative to duration of persistent priapism, overall condition of the patient, health literacy and comprehension, and physician experience. The available data suggest that prostheses placed in the setting of acute ischemic priapism are highly effective in providing detumescence,[18,43,44] relief of pain,[45] preservation of penile length,[3,18,46,47] return to sexual activity,[18,43,44,46,47] and overall satisfaction.[3,43,44,46] Infection rates were below 10% for all studies reviewed.

In theory, avoiding disruption of the distal tunica when the chance of priapism resolution is extremely low may prove advantageous for subsequent penile prosthesis placement. In the work by Zacharakis et al., less than half of the men who received a penile implant within 17 days of priapism onset had undergone prior distal shunting.[48] However, infection (7%) and erosion (3%) were unique to this cohort. The authors noted that distal perforation can occur in up to 6% of patients who have undergone previous shunt surgery. Of the men who received inflatable devices in delayed fashion (median: 5 months), 80% required narrow base cylinders. In a separate multicenter study with less patients, 40% of men with prior distal shunts undergoing penile implant placement required narrow base cylinders, and 20% needed subsequent explantation for distal erosion.[49]

Results of imaging in those with prolonged priapism may assist patient counseling. Likewise, if the prospects of functional recovery are dramatically low, clinicians may wish to weigh and consider the potential detriment of distal shunting for patients who may elect subsequent implant placement.

16. In a patient with acute ischemic priapism who is being considered for placement of a penile prosthesis, clinicians should discuss the risks and benefits of early versus delayed placement. (*Moderate Recommendation, Evidence Level: Grade C*)

Once it has been established that a patient suffering from acute ischemic priapism is a candidate for a penile prosthesis, either because other interventions have failed or the timeline suggests function is not otherwise salvageable, they should be counseled about factors relevant to the timing of device placement.

One study provided comparative data of early versus delayed penile prosthesis placement.[50] Results demonstrated that patients undergoing delayed placement were significantly more likely to report penile shortening and to undergo revision surgery. Similarly, the delayed group had a higher rate of infection (19% versus 7% for early placement). All cases of erosion and device malfunction were unique to the delayed group, and satisfaction was higher for the early placement group (96% versus 60% for delayed placement). When all data were considered, the reoperation rate was similar for early and delayed placement and rates of erosion, malfunction or failure, and penile curvature were low for all patients. However, infection rates and penile shortening were higher for delayed placement, and length was related to patient satisfaction.

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