Priapism Throughout the Ages
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ong-lasting penile erections are closely associated with the god Priapus. He was regarded as the son of Dionysus, god of the vine, and Aphrodite, goddess of beauty. When Aphrodite was pregnant, the story was that her mother Hera was jealous, had put her hands on the belly of her daughter and pronounced a curse. As a result, Aphrodite gave birth to Priapus, a misshapen dwarf with a large erect penis, who, as a result, was subjected to ridicule and assumed to lack intelligence. Since antiquity, long-lasting erections have been the object of scientific interest. In this article, we present the historical developments leading up to the current state of knowledge about this potentially dangerous medical condition. We have reviewed original primary sources written in Latin, German, English, Dutch, and French. We have placed our findings in a historical context and summarized the contributions of not just physicians but also historians and philosophers so that we can reflect on the observations that have led to the current insights.

ANTIQUITY AND THE MIDDLE AGES

The first recorded evidence of priapism is found in the Egyptian Ebers papyrus originating from 1550 BC. It was purchased in 1872 by the German novelist Georg Ebers, after whom it was named. According to this document, a persistent erection can be treated with watermelon, flax, pine and Hyoscyamus (a small genus of flowering plants in the nightshade family).

Centuries later, the Greek Demetrius of Apamea (fl. late-third to early-first century BC) was a scientist who gave one of the first descriptions of a persistent erection and distinguished priapism from satyriasis (hypersexuality). In his view, priapism could be due to dilated orifices of the arteries and the formation of pneuma in the cavernous nerve. According to philosopher Michel Foucault (1926-1984), Galen also blamed the presence of too much sperm. Like Galen, the medieval physician Guy de Chauliac (ca 1300-1368) thought that priapism was due to dilatation of the arteries. This French doctor wrote a lengthy and influential treatise on surgery in Medieval Latin, entitled Chirurgia Magna. From 1363 onwards, his treatise circulated in manuscript form before its first printing in 1478.

THE 16TH CENTURY UP TILL THE END OF THE 18TH CENTURY

The first modern description of priapism is often ascribed to De Petraens in his article entitled Gonorrhoea, satyriasis et priapisme, which was published in 1616. However, in his book La méthode curatoire de la maladie vénérienne, published in 1552, the French physician Thierry de Héry (1505-1599) had already given an outstanding overview of priapism and cited Galen in describing “an unwanted erection unrelated to sexual desire.”

In those days, the medical treatments of priapism had no significant effect but only an occasional temporary analgesic effect. Ambroise Paré (1510-1590), for example, recommended a poultice of nightshade, rhubarb, salad and water lily. Morgagni (1682-1771) discussed a peculiar form of priapism, namely the postmortem variant in hanged men. However, the Ephemerides, from the 1st millennium BC Babylonian astronomy, had already discussed this phenomenon. It was the first observation to indicate that priapism could also be of neurogenic origin. In that era, the exact mechanism of priapism due to hanging neck injury was not clear. However, it can now be assumed that the abrupt loss of sympathetic input to the pelvic vasculature as a result of hanging leads to uncontrolled arterial inflow directly into the sinusoidal spaces of the cavernous bodies.

In 1772, Maurel, a French surgeon from Bain de Bretagne, described an observation of a young boy experiencing priapism, and used the term “a case of uncontrolled arterial inflow.” He hypothesized that the morbid putrid blood had collected in the penis instead.
started to benefit from scientific methods and formal recording of empirical experiences in books and scientific journals. He argued that the treatment strategies were 3-fold: localized medical (e.g., cooling, leeches on the perineum, mercury) and surgical therapies, systemic treatments, such as emetics, bromide of camphor, and blood-letting and special ones intended to sedate or suppress sexual desire. In 1824, Thomas Callaway was the first to perform an operation on a patient with a priapism that had lasted 16 days. He incised the left crus of the corpora cavernosa (CC) and after squeezing out a large quantity of dark blood with numerous small coagula, the penis became flaccid.

In 1879, Salzer from Berlin discussed the possible pathophysiological mechanisms of priapism in leukemia, namely an impeded circulation in the smaller vessels and the formation of thrombi due to the altered circulation in the CC or an irritation of the nervi erigentes.

In 1907, 2 Parisian surgeons provided an overview of 48 case reports on priapism described in the 19th century. They classified the origin of priapism into 5 categories: nervous, leukemic, traumatic, inflammatory and idiopathic. We analyzed their report and have specified their findings in Figure 1.

Ten of 48 patients underwent surgical treatment in which either the CC were incised with crural, proximal, middle or distal shaft incisions, or transversal punctures of both CC were performed using a trocar.

In most cases, the incision site was left open and compressed with wet hot gauzes, although Terrier and Dujarier themselves advised to suture the tunica albuginea to “prevent inner adhesions”. Three of the 10 patients who underwent surgery remained potent compared to only 3 out of the 38 patients in whom no surgery was performed. Unfortunately, surgery was often complicated by hematoma and, in an era without antibiotics, the infection rate was very high.

By the end of the 19th century, Kast was the first to describe the late histologic consequences of long-lasting priapism on the erectile tissue. During the autopsy of a leukemic patient who suffered from prolonged (2 weeks) priapism, he found the CC to be transformed into a homogenous block of dense connective tissue with no trace of spongy tissue left and a thickened tunica albuginea. In response to this, Terrier and Dujarier stated that this fibrotic transformation could be avoided by an early operative intervention.

THE FIRST PART OF THE 20TH CENTURY

At the start of the 20th century, Frank Hinman Sr. (1880-1961) published a long article on the pathophysiology of priapism. He proposed a classification found in Figure 2.

Hinman also analyzed 33 surgically treated cases. He emphasized that an incision of sufficient length, extending well into the spongy tissue, had to be made slightly back to the middle part of the corpus at the dorsolateral side. In the interwar period, McKay and Colston had already introduced aspiration of clots and washing the CC with saline using a no. 8 Luer needle.

A REDISCOVERY OF SURGICAL, MEDICAL, AND MECHANICAL TREATMENTS AFTER WORLD WAR II

The most extensive review after World War II was published in 1950 by clinicians from Baltimore. They noticed that the first case of priapism associated with sickle cell disease was reported by Diggs and Ching in 1934. Later on, all series from the United States concerning priapism showed relatively higher percentages of patients with sickle cell disease.

In 1957, after unsuccessful application of ethyl chloride spray, spinal anesthesia and sedation, Brody et al utilized a ‘new’ technique, which consisted of heparinization for 4 days, followed by forcible massage of the penis under general anesthesia during 10 minutes. At follow-up, however, their patients reported erectile dysfunction and so the technique was abandoned. In 1964, Grayhack et al
described a procedure in which incision of the CC was followed by the creation of an anastomosis between the saphenous vein and the right cavernous body to enhance drainage.22

Additionally, in 1964, Raymond Quackels (1914-2013), who was inspired by Bolliger, wrote about proximal corpus spongiosum shunting, which is surgically less difficult than the previously described approach.23

In 1976, Mohammed Al-Ghorab published his technique that involved a 2-cm long transverse incision on the dorsal surface of the glans, about 1 cm from the coronal ridge.24 He excised a 5 × 5 mm segment of both CC, including a part of the septum, creating a relatively large shunt. The priapism disappeared in more than 90% of the patients, but most of them ended up experiencing ED.25

In 1976, Winter described a new approach that could be performed under local anesthesia, which was probably inspired by the Scandinavian urologist Ebbehøj (who published about a percutaneous technique to create a cavernoglandular shunt). Winter created a fistula between the glans and the CC using a biopsy needle followed by aspiration and irrigation.26,27 He thought that this minor procedure could replace open shunt surgery. However, the long-term results were poor. According to Nixon et al, the recurrence rate and the necessity for reoperation was as high as 85.7%.25 Before this procedure, Brant et al introduced a corporoglandular T-shunt with intracavernous tunneling performed under local anesthesia.28 The success of a T-shunt with “snake-tunneling” appeared to be strongly dependent on the duration of priapism.29 In patients with priapism >48 hours the T-shunt procedure failed to prevent erectile dysfunction.

### INTRACAVERNOUS MEDICAL TREATMENTS

The first report about the results of intracavernous injection of papaverin in 1982 by Ronald Virag became a milestone in the progress of understanding penile erection. Giles Brindley, a British physiologist, elicited wide surprise in 1983 during the annual American Urological Association meeting in Las Vegas.30 One of the organizers of the meeting challenged him to prove the effectiveness of his drug therapy beyond tables and statistics. Wearing sweat pants, Brindley presented his phenoxybenzamine-induced erection and even invited the audience to palpate his rigid penis. One year later, he reported his first successful experiments with the adrenergic drug metaraminol to treat iatrogenic priapism that had arisen after the intracavernous injection of phenoxybenzamine.31 For the second time, he had followed the great physiological investigators of the past who used themselves as the subjects of their own experiments.

In 2003, Montague et al reported that for patients with ischemic priapism, resolution occurred in 81% of patients treated with epinephrine, 70% with metaraminol, 43% with norepinephrine and 65% with phenylephrine.32 However, phenylephrine became the drug of choice due to the lowest cardiovascular risks.

### CONCLUSION

Historically, the term ‘priapism’ originates from the appellation given to the ancient mythological god named Priapus. A qualifying criterion of the disorder is that it persists beyond 4-6 hours. However, erections of shorter

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**Figure 2.** Schematic representation of Hinman’s classification and review of all priapism cases (n = 170) published in the literature from 1772 to 1913.
duration, as well as those lasting up to months, encompass the spectrum of its clinical representations.

The first recorded evidence of priapism was found in the Egyptian Ebers papyrus originating from 1550 BC. The etiology, diagnosis, and treatments have evolved considerably since then. A better understanding of the pathophysiology and the different types of long-lasting erections has significantly changed the diagnostic pathway and treatment options. However, the overall results with regard to erectile function in patients with ischemic priapism have been disappointing to date. With the current availability of different types of antibiotics we think, based on our review, that a re-exploration of old aggressive surgical approaches may be worthwhile, especially in patients who experience priapism for more than 48 hours.

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