

# Penile Gangrene Due To Strangulation By A Metallic Nut: A Case Report And Review Of The Literature

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## Abstract

Background: Penile entrapment and subsequent strangulation is a serious injury that requires a prompt treatment to avoid gangrene. Objective: We report our experience dealing with a case of penile gangrene following strangulation by a metallic nut in a middle aged Nigerian. Method: We summarized the case history, physical findings, investigations and operative treatment of a middle-aged man who slipped a round metallic nut over his penis, entrapping it for five days causing strangulation and subsequent gangrene. The literature on penile entrapment, strangulation and gangrene was also reviewed. Results: The patient presented in acute urinary retention and had complete gangrene of the penis. Suprapubic cystostomy was done and he had total penile amputation and perineal urethrostomy. Conclusion: Entrapment of the penis leading to strangulation is a rare condition that needs urgent relief, otherwise penile gangrene sets in, the treatment of which has very serious consequences.

## INTRODUCTION

Entrapment of the penis leading to strangulation and possible gangrene is a rare but very serious injury and its definitive treatment could have disastrous consequences on the patient<sup>1,2</sup>. Cases caused by metal rings<sup>2,3</sup>, plastic or glass bottles<sup>1,4,6</sup>, hammer heads<sup>5</sup> and many other objects have been described. The motive behind the action is as varied as the objects responsible for the injury but could be deliberate for masturbation or to improve sexual performance<sup>3,5</sup>. In other instances the patient could have some psychiatric or psychosexual problems<sup>5</sup>. The mode of removal and definitive treatment depends on the nature of the constricting object, for how long it has been there and equipment available<sup>6</sup>. A whole range of varying degrees of penile injury is possible from skin ulceration, urethral injuries and development of fistulae, to loss of penile sensation and gangrene<sup>7</sup>. There are no definite protocols for treatment but strangulating objects must be removed rapidly to prevent penile gangrene. We report a patient who had a thick metallic nut at the root of his penis for days and presented with total penile gangrene and acute urinary retention.

## CASE SUMMARY

A 60-year-old Nigerian presented to the accident and emergency department in acute urinary retention and a total infected gangrene of the penis. He is known to have some

form of mental illness for 20 years. Before then he was a successful businessman married to one wife and he has 4 children. He left home to an undisclosed destination and was found 5 days later in a nearby farm in urine retention and with a thick metallic nut entrapping his penis at the base (Fig. 1). He was said to have passed the nut himself after trying it on his fingers and finding it to be too wide for all of them. He could give no reasons for his action and claimed the nut has been there for only a day.

Physical examination revealed an unkempt elderly man not in any distress (urine retention was earlier relieved by suprapubic tapping by the casualty nurse); he was neither pale nor dehydrated. He was conscious and alert, with a Glasgow Coma Score (GCS) of 15. The pulse rate was 98 beats/minute, blood pressure 150/90mmHg, respiratory rate 24 cycles/minute and axillary temperature 37.5°C. There was a tense, tender and cystic suprapubic mass (suggesting a full bladder). External genitalia revealed a huge nut entrapping the penis at its root with overt features of gangrene. The right scrotal sac was hypotrophic and contained no testicle. The left hemi-scrotum and testicle were normal (Fig. 1). The packed cell volume (PCV) was 35%, serum electrolytes, urea and creatinine (EUCr) were within normal limits, and the random blood sugar (RBS) was 8.3mmol/L. The suprapubic urine sample was positive for blood (++), protein (+), glucose (++), and ascorbic acid (+) and had a pH of 5.

He was placed on intravenous (IV) normal saline, and IV Ceftriazone 1 gram in combination with 500mg of IV metronidazole. He also had tetanus toxoid 0.5mg as single dose and 1,500IU of equine anti- tetanus serum (ATS). He had an emergency suprapubic cystostomy (SPC) in the casualty followed a few hours later by a total penile amputation and a perineal urethrostomy, leaving a urethral stent which was removed after 7 days (Fig. 2). There was slight discharge from the urethrostomy site which cleared with twice daily dressing. The SPC catheter was spigoted and the patient was able to pass urine with a good stream. The psychiatrist is managing the patient as a schizophrenic. The patient was discharged 14 days postoperative to be followed up in the surgical out-patient department.

### Figure 1

Fig. 1: At presentation; note the black edematous penile shaft and the approximately 40mm long and 10mm thick metallic nut at the root, which has been there for 5 days.



### Figure 2

Fig. 2: Just before penile amputation; the gangrene and the strangulating metallic nut is more obvious. Note the suprapubic catheter.



## DISCUSSION

Total gangrene of the penis is not a common lesion. When it occurs, it may be due to Fournier's gangrene<sup>8</sup>, peripheral occlusive vascular disease<sup>9</sup>, or in some occasional patients a complication of diabetes<sup>10,11</sup>. Strangling agents used on the penis (an important cause of gangrene) were reported in the literature as far back as 1755<sup>12</sup> and since then about 60 cases have been reported in the world literature<sup>1</sup>. The majority of strangulating penile injuries are self-inflicted and the motives are as varied as the constricting agents. In the majority of patients, it is for erotic and autoerotic reasons<sup>4,5,6,13</sup>, in children it may be placed by ignorant parents to prevent enuresis<sup>4</sup> and others due to psychosexual or psychiatric disorders<sup>4</sup>. Agents of penile constriction, leading to strangulation and gangrene in some instances are varied but generally metallic objects, e.g. nuts, bolts, washers, hammer heads etc. are most commonly encountered<sup>13</sup>. Plastic and other less solid materials are said to cause more severe injuries than the metallic objects<sup>4,7,13</sup>.

At presentation, the patients are unable to remove the constricting agents after attaining an erection, and detumescence is not possible because of occlusion of the vessels, starting with the veins. If the patient presents at this stage, (when only the penile veins are occluded), that is within 48 hours or less, there will be gross penile oedema but intact distal penile sensation. If the presentation is late, that is 72 hours and more, there is arterial occlusion and gradual loss of penile sensation with danger of gangrene<sup>13</sup>.

Acute urinary retention occurs early in the progression because the urethra is superficial, (covered by a thin layer of corpus spongiosum) on the ventral aspect of the penis. The reason for late presentation in a patient with no psychiatric problems is the intense feeling of shame and embarrassment, whereas the psychiatric patient may simply neglect the injury until it is too late.

The diagnosis is obvious. A complete psychiatric evaluation was necessary in the index patient and removal of the gangrenous phallus must be prompt to prevent septicaemia and/or tetanus. The neglected case will also require adequate resuscitation; intravenous fluids and potent broad-spectrum antibiotics. The consent for operation had to be obtained from the close relatives. Psychiatric care is needed to rehabilitate the patient to accept the perineal urethrostomy.

There are no laid down protocols for the removal of these objects. The technique of removal and equipment needed is dependent on the constricting agent and the length of time of strangulation. However, prompt removal and decompression of the phallus is the aim in all cases as this will stop vascular, nervous and urethral injury and ensure optimal erection and urine flow. Delay in treatment is due to late presentation, the most severe consequence being complete penile gangrene. Bhat et al.<sup>7</sup> graded this injury into 5 categories, a useful guide to definitive treatment:

Grade I: Oedema of the distal penis. No evidence of skin ulceration or urethral injury.

Grade II: Injury to skin and constriction of corpus spongiosum, but no evidence of urethral injury. Distal penile oedema and decreased penile sensation.

Grade III: Injury to skin and urethra but no urethral fistula. Loss of distal penile sensations.

Grade IV: Complete division of corpus spongiosum leading to urethral fistula and constriction of corpora cavernosa with loss of distal penile sensations.

Grade V: Gangrene, necrosis, or complete amputation of distal penis.

Our patient is clearly a case of severe injury with vascular insult leading to complete gangrene (Grade V) and therefore was treated by total penile amputation and suprapubic cystostomy to divert the urine. The perineal urethrostomy was supported by a urethral stent for 7 days to allow for full patency at the junction of the skin and the urethra. A

background psychiatric illness was responsible for this action as in quite a number of reported cases<sup>4,6</sup>. The challenge in the management involves obtaining the consent for partial or total penectomy and subsequent postoperative management, which involves getting the patient to accept the perineal urethrostomy. This obviously calls for early involvement of the psychiatrist in the management.

In conclusion penile gangrene from a strangulating agent is uncommon. In this condition, the only operative option was a total penile amputation and definitive perineal urethrostomy. Getting the patient to accept this procedure is a serious challenge. This difficulty could be minimized by early involvement of the psychiatrist in the management. There is absolutely no other option than a prompt and safe removal of the strangulating agent by whatever instrument available. Removal of penile constricting devices can be very challenging and often requires resourcefulness and a multidisciplinary approach.

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