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# Sewer Gas Explosion In A Public Lavatory: An Unheard Cause Of Genital Burns

K Vagholkar, P Vagholkar

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## Abstract

### Introduction:

Sewer gas explosion emanating from the toilet seat fitting in a civilian public lavatory is unheard of. It can cause death by respiratory failure due to intoxicating gases as well as morbid physical injuries by way of burns, more so in the genital region.

### Case report:

A case of genital burns caused by a sewer gas explosion emanating from the toilet seat is reported.

### Discussion:

The mechanism of explosion, morbidity and management of genital burn injuries is discussed along with a brief review of literature.

### Conclusion:

Prompt assessment of systemic toxicity as well as local injuries followed by meticulous treatment is pivotal in keeping the morbidity and mortality to a bare minimum.

## INTRODUCTION

Genital burns are rare injuries. Several agents such as flames, hot liquids and chemical agents are responsible for causing genital burns. Electrical burn injuries have also been described. Patients' age and their environment have been found to have a definite impact on the etiology. Sewer gas explosion occurring in a public lavatory is extremely rare. Genital burns caused by such an explosion while in the lavatory are unheard of. A case of genital burns caused by sewer gas explosion in the lavatory is presented along with a brief review of the mechanism of the explosion and management of genital burns.

## CASE REPORT

A 22-year-old male patient presented to the casualty department with history of burn injuries to the scrotum, penis, inner sides of both thighs adjacent to the scrotum and the perianal region following an explosion emanating from the toilet seat in a public lavatory. The patient did not give any history of lighting or smoking a cigarette while in the

lavatory. On physical examination, the vital parameters were within normal limits. Systemic examination with special emphasis on the neurological and respiratory systems did not reveal any abnormal findings. Local examination revealed second degree burns involving the skin of the penis, anterior aspect of the scrotum, the inner sides of both thighs adjacent to the scrotum and the perineum (Figure1). The patient was admitted to the hospital. Intravenous analgesics, fluids and antibiotics were administered immediately. A combination of ceftriaxone, amikacin and metronidazole was given in view of the proximity of the burn injuries to the anal opening. Wound care was administered by application of topical antimicrobial agents. Urinary catheterisation was not done as the patient was passing urine without any difficulty. The patient was kept in hospital for a period of four days and discharged thereafter. He has been following up and has shown complete recovery with no residual morbidity with respect to the penis and the scrotum.

### Figure 1

Burn injuries involving the penis, scrotum, inner side of both thighs and the perineum.



### DISCUSSION

The etiology of burns in the case presented is unheard of. A study of internet resources did not reveal such an etiology for genital burns in the civilian setting, rendering this case one of the rarest of its type. Sewer gases include hydrogen sulphide, ammonia, methane, carbon dioxide, sulphur dioxide and nitrogen oxides. The sewer gas is typically denser than atmospheric gases exerting higher partial pressures as compared to normal air. Poorly constructed septic tanks for public lavatories are a common occurrence in Indian metros. The lack of inbuilt protective mechanisms in these septic tanks leads to a rapid accumulation of sewer gas, thereby causing a steep increase in pressure within the closed septic tank. When this pressure exceeds a certain level by way of rapid expansion of individual gases, an explosion can take place. Methane, which is present in high concentration, is extremely combustible. Therefore presence of a flame accidentally originating from a cigarette or a loose sparking electrical connection in such an environment can lead to a disastrous fire. Hydrogen sulphide is another toxic component of sewer gas. It can lead to toxicity ranging from shortness of breath to immediate collapse and death. Hence a combination of methane and hydrogen sulphide in high concentrations can lead to lethal outcome in case of an explosion.

In the case presented, the patient had adopted a squatting position in the lavatory; therefore, maximum burn injuries were sustained in the region of the genitalia and inner aspect of both thighs. Managing such cases is at times a challenge as both functions of passing urine and stools can be affected. Urinary catheterization should be avoided as much as

possible as this can serve as a source of infection. [1] It can also lead to urethral stricture at a later date. The shaft of the penis can be badly affected leading to difficulty in passing urine. In such cases a suprapubic cystostomy is a preferred option. [1, 2] In the case presented catheterization was not required as the patient was passing urine without difficulty. If the perianal region is badly affected by third-degree burns, infection may become an inevitable sequel difficult to manage. If the burn injury involves not only the skin but also the underlining muscles in the gluteal region, fecal diversion by way of a proximal colostomy is advisable.[3] It is a safe practice to administer both tetanus and anti-gas-gangrene prophylaxis in such patients.

Wound management, especially of the penis and the scrotum, needs special attention. In majority of cases involving first to second degree burn injuries of the penile skin, topical therapy is sufficient. However, in deep burns involving the penile skin and the corpora, active surgical management may be warranted. Limited debridement may have to be performed with utmost care to restrict it to the superficial layers. Tissue defects of the penile shafts are best managed with full-thickness grafts. Utmost care has to be taken to obtain these grafts from body areas devoid of hair growth in view of the cosmetic implications. Full-thickness grafts prevent contractures. But in certain cases, the area may be extensive, thereby limiting the availability of full-thickness grafts. In such cases artificial skin (Integra) may be used to reconstitute the dermis followed by split-thickness skin grafting. [4] Contractures of the penile shafts can be treated by multiple Z-plasties. [1, 2] Hypertrophic scar tissue on the prepuce is best removed by simple circumcision.

Scrotal burn injuries have to be treated carefully. Great care needs to be exercised until healthy granulation tissue develops. Many a time, one or two sessions of debridement may be required to clear the slough if present. [5] Infection can lead to the disastrous sequel of Fournier's gangrene. [6] Once healthy granulation has set in, split-thickness grafting can be performed.

Electrical injuries, especially of the penis, usually have very poor outcomes. These injuries usually cause extensive destruction of the soft tissues of the penile shaft, eventually ending up in an amputation. [7]

### CONCLUSION

Sewer gas explosion in a public lavatory leading to genital burns is unheard of till date rendering this case worthy of being reported. Such incidents should be reported to public

health authorities for immediate structural corrections of the concerned faulty facility.

The extent of respiratory and burn injuries need to be carefully evaluated and managed.

Judiciously planned treatment algorithm is the main stay for successful outcome in genital burn injuries.

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**Author Information**

**Ketan Vagholkar, Professor of Surgery**

Dr.D.Y.Patil Medical College

Navi Mumbai India

kvagholkar@yahoo.com

**Parth Vagholkar, F.Y. B Tech Student**

Institute of Chemical Technology

Mumbai India