Isolated Gangrene of the Penis in a Paraplegic Patient Secondary to a Condom Catheter

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Abstract Isolated gangrene of the penis is rare. Our case was unusual in that gangrene developed due to continuous tourniquet effect on the penis caused by a condom catheter. Also, men with paraplegia appear to have a greater incidence of bacterial colonisation of genital skin as compared to neurologically normal controls. Early therapy is the key, including debridement of entire shaft of the penis distal to the devastated area, parenteral broad-spectrum antibiotics, repeated antiseptic dressings and skin grafting. Early diagnosis by a strong index of suspicion ensures a favourable outcome. Since gangrene of the penis is an irreversible process, this case highlights the importance of proper care and routine maintenance of condom catheters in preventing this complication. Despite extensive search of the literature, I have been able to find only few such cases.

Keywords Gangrene · Penis · Condom catheter

Case Report

A twenty five year old male patient developed sub arachnoid hemorrhage and paraplegia at T-7 level after a road traffic accident. He was admitted in our surgical intensive care unit (SICU), had a total paralysis with bladder and bowel dysfunction. Subsequently, he was shifted to general ward and was put on a condom catheter. On twenty third post traumatic day, patient developed

discolouration and subsequent gangrenous changes of penis. The patient was febrile. Local examination revealed discolouration of entire penile skin. Multiple vesicles filled with haemorrhagic fluid were present over the penis (Fig. 1). There were no other foci of infection in the genito-perineal area. The prostate gland was normal on rectal examination. Haematological examination revealed leucocytosis and neutrophilia. Random blood sugar, blood urea and serum creatinine were within normal limits. Urine microscopy and urine culture revealed no abnormality. Ultrasonological examination of abdomen and pelvis was normal. Ultrasound of scrotum, performed was also normal. Discharge sent for culture isolated mixed growth of *Streptococcus pyogenes*, *Proteus mirabilis*, *enterococci*, *Bacteroides fragilis* sensitive to cefotaxime, ceftriaxone, piperacillin tazobactam, cefipime and amikacin.

Broad spectrum antibiotics cefotaxime, piperacillin tazobactam and metronidazole were administered parenterally. Emergency multiple decompressing incisions were placed over the gangrenous penile skin & inflammatory fluid was drained. After repeated debridement and dressings for nine days, the bed was finally healthy (Fig. 2); meshed split thickness skin graft was performed. Histology of excised tissue revealed full thickness coagulative necrosis with no viable skin. The antibiotics were given for eighteen days (nine days - pre grafting and eight days - post grafting). Post-operative period was uneventful. At two and a half month follow up, the patient is asymptomatic with satisfactory cosmetic outcome.

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Discussion

Condom catheters are external urinary drainage devices mainly applied in bedridden and incontinent patients.

Fig. 1 Showing gangrenous changes involving the shaft of penis. Also seen are some vesicles containing hemorrhagic fluid. Note is also made about the cleavage at the base of penile shaft where the gangrene stops abruptly, the place where the condom is secured by the latex rim or by adhesive tapes

Although these catheters are more comfortable and less painful than indwelling catheters, they are not completely without risk. Following the acute phase of spinal cord injury (SCI) several bladder management possibilities exist. The chosen method depends on the urodynamic findings, available resources and patient preferences. Most patients with SCI will use urethral catheterisation, either as indwelling catheterisation or clean intermittent self-catheterisation (CISC) [1]. The use of condom drainage system can render a male SCI patient effectively dry, but can lead to penile or urethral complications in 15–30% of patients [2]. Other commonly reported problems range from allergic reactions and local defects in the skin, to gangrene and partial

Fig. 2 Shows final appearance of penis after repeated antiseptic dressings (penis fit for grafting)

amputation of the penis [3, 4]. These complications are more commonly seen in developing countries like India where people usually lack the knowledge about proper use of these catheters. Our patient developed gangrene of the penis, which progressed rapidly. Understandably, this was a frightening experience to our patient. The mechanism of the development of gangrene is similar to strangulation by metallic objects [5]. The tourniquet effect causes penile engorgement from the decrease in venous and lymphatic drainage. If the tourniquet effect continues, arterial flow is also compromised, resulting in ischemia and gangrene of the penis. Lack of nociceptive feedback in SCI patients renders patients unaware of painful sensation due to the tourniquet effect of the catheter. It is possible that decreased natural and adaptive immune responses, reported in the patients with SCI and subsequent paraplegia, may have also played a role in the rapid extension of localised necrosis of penis in this patient. Depressed immunity and impaired proliferation of haematopoietic progenitor cells in the patients with spinal cord injury may be explained by the fact that the innervation of the bone marrow below the injury lacks normal supra-spinal activity, that is, a decentralised bone marrow [6]. It is likely that the presence of a condom catheter increased skin moisture around the penis due to urine leakage. Also, compromised personal hygiene, a neurogenic bowel, and subtle dysfunction of the immune system contributed to colonisation, and then rapid progression of the superadded infection in this patient. The diagnosis of this condition is based on clinical examination, which includes local assessment of temperature, colour, sensations, and pulsations distal to the constriction band. Colour doppler study of the penis is helpful in identifying blood flow distal to the constriction band. Proper application and routine care of condom catheters is important in preventing this complication. The appropriate size of condom suitable for the penis should be selected. Before applying the condom catheter, the penis should be cleaned with soap and water and then dried. It is also important to note that the adhesive tape of the condom at the base of penis is not applied too tightly. The skin of the penis should be inspected one hour after applying the condom catheter to assure that the catheter is not placed too tightly. The applied condom catheter should be changed every 48 hours. Immediate medical attention has to be sought if the penis becomes very red or swollen. If the patient presents early in the course of the problem, the penis can be salvaged by promptly removing the offending device. Total penectomy is necessary if gangrene has set in. I believe that spinal cord injury patients and their carers should be made aware about the correct technique of wearing a condom catheter and also of possible increased susceptibility of SCI patients to opportunistic infections of the skin.

Increased awareness will facilitate prompt recourse to medical advice, when early signs of infection or gangrene are present.

References

1. Jamil F (2001) Towards a catheter free status in neurogenic bladder dysfunction: a review of bladder management options in spinal cord injury (SCI). *Spinal Cord* 39:355–361
2. Golji H (1981) Complications of external condom drainage. *Paraplegia* 19:189–197
3. Harmon CB, Connolly SM, Larson TR (1995) Condom related allergic contact dermatitis. *J Urol* 153:1227–1228
4. Steinhardt G, McRoberts JW (1980) Total distal penile necrosis caused by condom catheter. *JAMA* 244:1238
5. Detweiler MB (2001) Penile incarceration with metal objects: a review of procedure choice based on penile trauma grade. *Scand J Urol Nephrol* 35(3):212–217
6. Iversen PO, Hjeltne N, Holm B et al (2000) Depressed immunity and impaired proliferation of hematopoietic progenitor cells in patients with complete spinal cord injury. *Blood* 96:2081–2083