Severe Indwelling Urinary Catheter-Associated Urethral Erosion in Four Elderly Men
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Abstract
Medical devices often are overlooked as a potential cause of pressure ulcers. Indwelling urinary catheters have been described as a cause of urethral erosion. In men, the resultant partial-thickness or full-thickness wound can involve a small area of the glans penis or cleave the glans or penile shaft, requiring reconstructive surgery or urinary diversion. During a 3-month period, four elderly men, all residing in one unit of a long-term care facility, were referred to the wound specialist for erosive urethral injuries. All were observed to have a history of improper securement of a rigid style silicone catheter. As part of creating a latex-free environment, the facility had recently replaced the (softer) latex-containing catheters with new silicone catheters. In addition to providing meticulous catheter care and comfort measures for the patients, all securement procedures were reviewed and different silicone catheters were evaluated for their potential to cause pressure ulcers. This case series highlights the importance of careful evaluation of catheter materials and securement devices before selecting them for widespread patient use and emphasizes the need for research focused on catheter composition and pressure injury risk.

Key Words: urinary catheters, silicone, complication, urethral erosion, pressure

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Incontinence rates are high among older patients and incontinence remains the primary reason for admission to long-term care (LTC) facilities. Incontinence increases the risk for perineal dermatitis, pressure ulcers, hip fractures, and falls. In an effort to reduce comorbid conditions, an indwelling urinary catheter may be placed. Despite the known complications of long-term catheter use (bacteremia, urinary tract infection, sepsis, and death), for many elderly LTC residents this may be the only intervention that will preserve skin health and maintain comfort and dignity.

Pressure ulcers most often are associated with skin breakdown over bony prominences due to unrelied pressure; less commonly, they are associated with medical devices. In practice, medical devices often are overlooked as a potential cause of pressure and research on pressure ulcers caused by the use of medical devices is scant. In one study, Davis et al reported that 33% of 90 medical patients wearing cervical collars for stabilization sustained a pressure ulcer in less than 5 days. Although medical devices are commonly used in both acute care and LTC, pressure ulcer statistics often do not differentiate source of pressure.

An uncommon complication of urinary catheterization is severe urethral erosion, noted in the literature as a known but rare consequence of indwelling catheter use in spinal cord injured patients of both genders. LeBlanc and Christensen addressed nursing care issues such as catheter care and pain control associated with urethral erosion in elderly men in the LTC setting; otherwise, information about this type of pressure ulcer is scarce in the literature.

Urethral erosion in men ranges from a partial-thickness wound involving a small area of the glans penis to a full-thickness pressure ulcer, or erosion, cleaving the glans or penile shaft (see Figure 1). In extreme cases, gangrene of the penis can result. Erosion secondary to catheter placement can cause bleeding from the edges of the urethra and increases the risk of urinary tract infection. Patients may...
require urethral reconstruction, which is often a complex, multistep surgical procedure. Individuals with multiple medical comorbidities ultimately may require urinary diversion. Penile erosion may be physically and psychologically painful due to disfigurement.3

Preventing Urethral Erosion

Logically, the optimal way to prevent urethral erosion is to avoid using an indwelling urinary catheter if feasible. Other options for managing urinary incontinence include implementing a toileting program; using disposable briefs, pads, or condom catheters; placing a suprapubic catheter; or intermittent catheterization.9,10 The latter may be a viable option for some patients but is impractical in the elderly patient with cognitive impairment, limited dexterity, or lack of caregiver support. Suprapubic catheterization reduces the risk of urethral erosion but the catheter can cause pressure at the abdominal insertion site.11 Use of condom catheters and other external urinary collection systems is associated with an increased risk of skin injury and irritation.9 Incontinence containment products such as disposable briefs or pads are most commonly used to manage urinary incontinence. Their use increases the risk of developing skin problems such as dermatitis, maceration, fungal and bacterial infections, and skin breakdown.9 A toileting program is a documented, proven behavior treatment plan for incontinent elderly adults with slight to moderate cognitive impairment and should be considered an option before an indwelling catheter is placed.1

If a urinary catheter is used, proper securement is a priority. Improper urinary catheter securement is associated with urethral erosion6-8; however, the optimal way to secure indwelling catheters remains controversial and there is no evidence to guide practice. Several best-practice models9,10 recommend securing the catheter to the upper thigh on a woman and on the abdomen for a man. Some facilities follow an older practice of taping the catheter to the thigh but expert opinion suggests that tape may not stay on well, can cause skin problems, and may damage the core of latex-coated catheters.12 Devices designed to secure catheters include elastic leg straps and adhesive products to hold the catheter in place.9 Anchoring the catheter with a leg strap will allow some movement of the catheter and may avoid traction at the tip of the catheter. Conversely, improper positioning of a leg strap can allow the strap to migrate down the leg and place tension on the catheter. Adhesive stationary catheter holders affix to the skin but expert opinion suggests that tape may not stay on well, can cause skin problems, and may damage the core of latex-coated catheters.12

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Nursing Management of Urethral Erosion

Caring for patients with urethral pressure ulcers is challenging. Unlike other pressure ulcers, urethral erosion is permanent and standard wound care may not be of benefit. Surgical correction is the only option to repair the defect.8 If the catheter cannot be removed, a securement method that is consistently applied, works for the individual patient, and prevents further erosive injury and/or discomfort is a must. Nursing caregivers need to continue monitoring device securement because no method is infallible and adhesive products also can cause skin damage. If the patient experiences pain during catheter care, pain medication

Key Points

- This case series describes the occurrence of urinary catheter-associated pressure ulcers in four elderly, male, long-term care residents.
- Because the occurrence of this complication was rarely observed before, all cases were carefully reviewed.
- In addition to a history of improper securement procedures, it was noted a recently purchased silicone catheter was used in all patients.
- The author concludes that all new devices should be carefully reviewed before widespread use and that research to evaluate the potential of different catheters to cause pressure ulcers is needed.
should be administered approximately 30 to 60 minutes before the procedure as per general practice guidelines.

Many elderly patients have medical comorbidities such as a cardiac history or pulmonary disease that may preclude surgical repair of the urethral erosion due to elevated surgical risk. For younger patients, urethral reconstruction is an option, although Secrest et al. have found a lower success rate for patients with spinal cord injury than for those with intact spinal cord. Secrest et al. studied 17 patients with neurogenic bladder who underwent urethral reconstruction. Of those, 11 with spinal cord injury required reoperation and all eventually required urinary diversion. Based on these findings, the authors recommended that early urinary diversion may be the best option for men with severe urethral pathology and spinal cord injury. More recently, Casey et al. retrospective study (N = 23) reported a 70% success rate with urethral construction. The authors noted that many of the patients undergoing urethral construction had surgery early after incurring the urethral erosion and the patients did not return to using an indwelling catheter.

For elderly persons with erosive injury and no complications such as pain or frequent urinary tract infections, conservative comfort care is usually the best option. The goal of care should include preventing further erosion and protecting exposed mucosa. Based on expert opinion, regular catheter care using soap and water is important for hygiene and may help prevent urinary tract and skin infections. For friable or painful areas, wound care using antibiotic ointment or advanced wound dressings may be appropriate. For example, a foam dressing may protect the mucosa from additional pressure and decrease discomfort if present. Case presentation may afford a valuable learning experience for caregivers and providers. As such, four cases of elderly men with urethral erosion treated in a LTC setting are presented. This LTC facility has 90 beds and is attached to a small medical center. Patients are admitted for subacute care, short-term rehabilitation, and residential care including hospice and dementia. The incidence of urethral erosion at this LTC facility before the cases presented was unremarkable. The development of urethral erosion in four consecutive patients residing on the same unit over a 3-month time frame prompted an inquiry into causation.

Urethral erosion is always a risk with indwelling catheter use, especially in men with long-term catheters. Although existing evidence supporting catheter securement is not available, practical knowledge suggests that proper securement prevents irritation, erosion, and excessive tension on the catheter and promotes patient comfort.

Case Reports

Case 1. Mr. M is 75 years old with a history of left leg amputation, cardiac disease, and mild cognitive impairment. He was diagnosed with urinary retention despite a transurethral resection, so the urologist recommended continuation of an indwelling catheter. Mr. M had a recurrent pressure ulcer mid-back over a kyphotic thoracic spine. He was not ambulatory due to lack of prosthesis and general debility but could transfer from wheelchair to bed by himself. Mr. M got out of bed without staff assistance, would not use a leg bag, and often was reported to not move his bag with him when he got out of bed. An indwelling catheter was inserted and after approximately 5 weeks he sustained full-thickness ventral erosion extending to the base of the penis after catheter insertion. He denied pain with his injury. Treatment was conservative and included catheter care and application of antibiotic ointment twice daily. A focal point of treatment was consistent catheter securement because during weekly wound rounds it was noted that the catheter was not properly secured and torsion at site was evident.

Case 2. Mr. Y is a 74-year-old patient with diabetes receiving palliative care following an auto accident that caused severe cognitive impairment. He had sustained no fractures or internal trauma. Mr. Y was thin, frail, and unable to feed himself. He was receiving occupational therapy but was not expected to be able to walk again. Historically, he was on a ventilator. He initially had been admitted to LTC with an ischial pressure ulcer acquired at a rehabilitation facility 3 months earlier. A catheter was placed to allow healing of the ulcer, which resolved in approximately 5 weeks. In less than 4 weeks, Mr. Y had sustained full-thickness ventral erosion extending to the base of the penis due to an indwelling catheter. The catheter was removed at that time and not replaced. The tear remained but no treatment was indicated except perineal hygiene. Mr. Y was on a toileting program and wore diaper briefs overnight.

Case 3. Mr. S is 74 years old with moderate cognitive impairment. He had venous insufficiency and diabetes and was becoming progressively more debilitated with each LTC admission. He could transfer himself to the wheelchair but was not ambulatory. Mr. S was diagnosed with urinary retention and was given several trials of intermittent catheterization, which he reportedly failed. His provider decided to reinsert and leave the catheter in place. Mr. S frequently pulled on his catheter and moved out of bed without concern for the catheter bag. Within 2 weeks of catheter insertion, he sustained full-thickness ventral erosion extending to the base of the penis. He denied having pain. Because the provider decided to leave the catheter in place, securement was the focal point of treatment. Twice-daily catheter care was ordered, including washing and application of an antibiotic ointment. An adhesive catheter holder was the source of a skin tear, so Mr. S was provided an elastic strap. There was no urine leakage at the meatus. Unfortunately, Mr. S had recurrent urinary tract infections due to an indwelling catheter. His urologist did not think he was a good surgical candidate.

Case 4. Mr. A is 75 years old, frail, and had partial urethral erosion on the lateral glans penis. The erosion measured less than 1 cm in length. There was exposed mucosa without bleeding or exudate from the site; Mr. A did not report pain.
Mr. A was on palliative care for colon cancer for approximately 2 months; he was eating and drinking very little. An indwelling catheter was inserted to keep him dry and more comfortable. Twice-daily catheter care was ordered, the catheter was secured, and it remained until his death 2 to 3 weeks after the erosion occurred.

Discussion

Several commonalities were noted among the men in this study. All were elderly and dependent on the nursing staff for basic care, all had chronic diseases, most had a diagnosis of urinary retention, all had urological evaluations, and none were considered good candidates for surgery. Another common denominator was a lack of consistent, proper catheter anchoring procedures. This issue was repetitively identified during weekly wound rounds.

It also was noted that all urethral pressure ulcers occurred after the facility stopped using latex and began using silicone catheters, suggesting catheter type may have contributed to the increase in urethral injuries observed. The facility made the catheter change in an effort to eliminate the use of latex-containing medical devices but the silicone catheters were stiff and not as pliable as the latex catheters formerly used. A review of the literature was completed seeking a possible relationship between urethral injury and catheter composition; no information was found.

Strategies for managing urinary incontinence, other than indwelling catheters, should be considered regularly unless no other options are feasible for an individual. Educating nursing and home caregivers in cleansing procedures and securement methods can decrease the risk for erosive injury and urinary tract infections. Too often, urethral catheters become so common-place in LTC settings that caregivers become relaxed in their methods of handling catheters and drainage bags. In this author’s experience, handling catheters with the same respect one would an intravenous catheter may help prevent urinary tract infections and urethral erosion and promote patient comfort.

Conclusion

Medical devices may be an overlooked cause of pressure ulcers in the LTC setting. Severe erosive urethral injury can occur with indwelling urinary catheters over a short time period. Unlike many other pressure ulcers, no topical therapy will heal the defect caused by tissue erosion. The consequences of this complication cannot be understated; gangrene may occur and major surgery may be required after this preventable injury. Education is key to recognizing the risk of indwelling catheters on pressure ulcer development in vulnerable populations. This should include education on proper securement of indwelling catheters and subsequent monitoring of the insertion site.

In this case series, improper catheter securement and use of a certain type of silicone catheter appear to have contributed to the development of erosive urethral injuries. As a result, a quality improvement project was initiated. Alternative nonlatex catheters and different types of securement devices were evaluated. A softer silicone catheter was selected for future use and staff education included a renewed emphasis on the importance of monitoring catheter securement.

This case series highlights the need for careful evaluation of catheter materials and securement devices before selecting them for widespread patient use and emphasizes the need for research focused on catheter composition and associated pressure injuries.

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DECEMBER 2010 OSTOMY WOUND MANAGEMENT 39