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Urinary Management With an External Female Collection Device

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ABSTRACT

BACKGROUND: Strategies to decrease use of female indwelling urinary catheters and catheter-associated urinary tract infections are challenging due to the limited availability of proper fitting external collection devices. Female urinary incontinence predisposes the skin to potential pain, itching, burning, infection, or pressure injuries.

CASE STUDIES: This article discusses 3 patients' trajectory of care with use of an external female urinary collection device. All of these females were incontinent of urine after the indwelling urinary catheter was removed and managed with an external female urinary collection device.

CONCLUSIONS: The use of an external female urinary collection device is a feasible alternative to an indwelling urinary catheter as well as managing urinary incontinence.

KEYWORDS: Catheter-associated urinary tract infection, Female external collection device, Incontinence-associated dermatitis, Urinary incontinence.

INTRODUCTION

Catheter-associated urinary tract infections (CAUTIs) continue to be one of the most common hospital-acquired infections reported.[1-3] In acute care hospitals, 12% to 16% of inpatients have an indwelling urinary catheter at some point during their hospitalization where the risk of infection increases by 3% to 7% each catheter-day.[1,2] Institutions' strategies for prevention of CAUTIs have been variable, depending upon evidence-based knowledge, administrative support, and the population's severity of illness.[4] Evidence supports strategies to decrease the number of indwelling catheters to prevent CAUTIs in the acute care setting.[1,5-8] However, this change can lead to secondary complications, specifically urinary incontinence.

Until recently, alternative management of urinary incontinence with an external urinary collection device has only been successful with males.[6,9] A multitude of designs with a variety of materials have been created through the years for females, but none have flourished.[6,9] Therefore, the problem is managing female urinary incontinence and leakage after removal of an indwelling catheter. Discontinuing the catheter prevents a CAUTI but may lead to incontinence-associated dermatitis (IAD). Urinary incontinence predisposes the epidermal layer of skin to damage by raising the pH, causing potential adverse outcomes such as pain, itching, burning, infection, or pressure injuries.[10-14]

Unlike some of the male versions of an external collection device that adheres to the external genitalia, the female external urine collection device (Sage PrimaFit External Urine Management System for Females; Sage Products, a division of Stryker, Cary, Illinois) conforms to the perineal area between the labia, against the urethra. The device is connected to low continuous suction providing a sump mechanism to collect and measure urine output. In addition, there is a continuous air flow promoting a microclimate environment to the female perineum region.

The following 3 cases illustrate the application of a female external urine collection device. Approval from the institutional review board was obtained for this article illustrating the use of a female external urine collection device in 3 adult patients with urinary incontinence.

CASE 1

Mrs A. was a 45-year-old white woman with a history of fistulizing Crohn disease with multiple enterocutaneous fistulas and short gut, congestive heart failure, asthma, pancreatitis, deep vein thrombosis, portal hypertension, ascites, splenic varices, delirium, and chronic pain. Nutrition was delivered via a regular diet and supplemented with continuous parenteral nutrition. She had had multiple central venous lines, with numerous readmissions for central line–associated infections and sepsis. Most of her readmissions had required placement of an indwelling urinary catheter due to her severity of illness. Mrs A. had resided in an extended care facility for a couple of years, averaging approximately monthly hospital readmissions.

It was during one of Mrs A.'s hospitalizations that she was admitted to the surgical intensive care unit (ICU) for bleeding

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and sepsis where her course of recovery was intense. She required mechanical ventilation, vasopressors, and antibiotic therapy for bacteremia. Mrs A.'s progression of recovery days later included removal of an indwelling urinary catheter to decrease the risk of CAUTI. The first 24 hours was difficult, she reported the urge to urinate every 30 to 45 minutes. This was concerning, as she was at risk for a skin injury due to her nutritional status and other risk factors including increased time spent on a hard plastic bed pan. This urinary frequency continued throughout the nighttime, leaving her with minimal sleep and risk for delirium. The female external urine collection device was offered and implemented as an alternative option for her incontinence. Mrs A. was able to sleep at nighttime, promoting further recovery from this septic episode and, as a result, Mrs A. continues to request the device with each readmission.

CASE 2

Mrs B. was a 62-year-old white woman with a history of sphincter of Oddi dysfunction, restless leg syndrome, and depression. Two days post–endoscopic retrograde cholangiopancreatography, she was admitted to the medical ICU with septic shock as a result of *Escherichia coli* bacteremia and duodenal perforation. Mrs B. was intubated for respiratory failure and developed acute kidney injury. She was then placed on continuous renal replacement therapy and transitioned to intermittent hemodialysis before full renal recovery. Prior to discharge from the medical ICU to the medical progressive care unit (PCU) on day 24, Mrs B. received a tracheostomy for continued respiratory failure, was treated for deep-vein thrombosis and pulmonary embolus, and had a drainage catheter placed by Interventional Radiology to manage an abscess.

Mrs B. had had a complicated hospital course following the duodenal perforation. Ultimately, Mrs B.'s condition was reduced to physical therapy, occupational therapy, and artificial nutritional support. Soon after transfer to the medical PCU, neurology was consulted for possible delirium. Mrs B. was unable to sleep, suffered from anxiety, and later developed encephalopathy. Return of her renal function was marked by improved urine output. She was unfortunately incontinent, which was contributing to her sleepless nights. Nurses were trying to avoid placing an indwelling urine catheter due to the risk of infection. This situation prompted the use of the female external urine collection device, not only to help prevent sleep loss leading to delirium but also to avoid adverse skin outcomes. As physical therapy continued to work with Mrs B., her condition improved and she was able to be minimally assisted to bedside commode and the female external urine collection device was eventually discontinued.

CASE 3

Mrs C. was a 78-year-old white woman with a history of hypertension, asthma, anxiety, primary biliary cirrhosis, and gastric esophageal reflux disease who presented with end-stage liver disease, ascites, and large esophageal varices. Nine days prior to admission, she was treated for spontaneous bacterial peritonitis, bacteremia, and empyema. She was subsequently admitted via the emergency department to the medical PCU with altered mental status. She complained of dysuria, urinalysis was positive for *Candida tropicalis* urinary tract infection (UTI), and she had a documented Stage 1 pressure injury on admission.

Initially, urinary incontinence was of primary concern for the nurses since Mrs C. was admitted with a pressure injury. This triggered the use of the female external urine collection device as an alternative to placement of an indwelling urinary catheter. Tube feedings were soon initiated, unfortunately, resulting in fecal incontinence, and Mrs C. began showing signs of IAD. This skin breakdown required consultation from WOC experts for treatment and recommendations. Despite Mrs C.'s waxing and waning mental status, she was compliant with the use of the female external urine collection device that facilitated her skin to stay dry and nurses to capture drainage output and assess collected urine for color and clarity. Mrs C.'s family continued to advocate for the use of the device as an alternative for indwelling urinary catheter placement.

Unfortunately, Mrs C. eventually required placement of an indwelling urinary catheter secondary to the inability to use the female external urine collection device due to large amounts of fecal incontinence. On hospital day 17, Mrs C. was diagnosed with an *Escherichia coli* CAUTI, which may have resulted from the increased fecal incontinence. Upon patient stabilization and transition to oral diet, there was no longer a clinical indication for the indwelling urinary catheter. Once again, the family requested use of the alternative external female collection device to manage Mrs C.'s ongoing urinary incontinence. The use of the device prevented further wound injury, and with wound expert consultation, Mrs C.'s IAD resolved by the time of discharge to a skilled nursing facility.

DISCUSSION

After review of the literature, we identified a dearth of evidence regarding management of female urinary incontinence. According to Pieper and Cleland,[9] multiple female external collection devices have been attempted over the years but not without ongoing major challenges such as urine leakage and skin irritation. They identified many different types of female external collection devices, mostly in foreign journals, and without availability for market purchase.[9] The technology and designs of such products have varied from the use of suction, adhesives, and support belts.

Our experiences with these cases suggest that the female external urine collection device is a viable alternative to an indwelling urinary catheter or intervention for urinary incontinence and minimizes the risk for skin injury and infection (Figures 1 and 2). The female external urine collection device was utilized on a wide variety of female patients in a medical and surgical environment with variability in body mass index and ages. Nurses caring for these patients reported satisfaction secondary to the decreased workload of frequent linen changes, the ability to capture and record drainage output, and general excitement about a practical alternative to help keep patients safe from infection and skin injury. Patients in these cases were satisfied with the use of the female external urine collection device for multiple reasons. In all 3 cases, there was a request for continued or repeat use by the patients during their length of stay. In case 1, the patient routinely requested use of the female external urine collection device when readmitted to the hospital. Patients in these cases have also reported a sense of cleanliness, increased comfort by staying dry, and less frequent linen changes leading to reduction in pain and discomfort. An additional benefit of the female external urine collection device is no residual pooling of urine present at the urethral opening in comparison to male external collection

Figure 1. Female external urine collection device aligned with the perineum between the labia against the urethral opening.

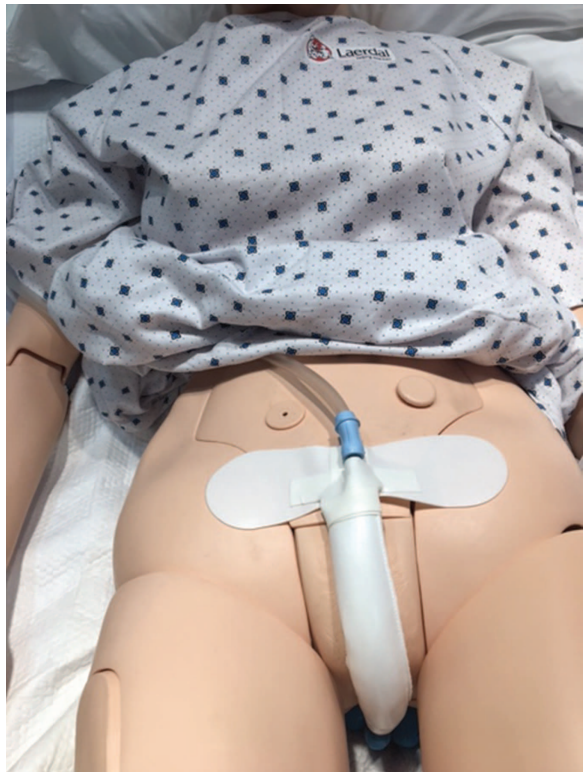

Figure 2. Device in place, with secured adhesive backing over the suprapubic region and connected to continuous suction.

devices, which can still ultimately lead to skin damage or a UTI. In our experience, having initial conversations regarding self-toileting was helpful to reduce mobility barriers and patients' dependence on usage.

SUMMARY

Female urinary incontinence is a challenge to manage in the acute care setting. The female external urine collection device is a feasible alternative, regardless of patient population or body habitus, to an indwelling urinary catheter and should be considered for prevention of hospital-acquired conditions. It allows for ongoing monitoring of continuous output, aids in the provision of patient dignity, and, reportedly, improves nurse satisfaction. Consultation of the WOC nurse along with an interdisciplinary team approach is vital to successful management of the complex patients we care for in the acute care setting. Additional research is needed to evaluate the effectiveness of this alternative female external urine collection device in managing female urinary incontinence.

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