ABSTRACT

Tubular dressing retainers are commonly used to apply and hold dressings, creams, and other devices in place. However, improper application of the retainer and use of incorrect size, especially on digits, has caused harm to patients. Injury can occur if the tubular dressing retainer is mistakenly used as the gauze dressing, especially if multiple layers are applied with multiple turns. Since June 2004, PA-PSRS has received two reports indicating circulatory compromise to digits with tubular dressing retainer application. Additionally, the U.S. Food and Drug Administration’s Manufacturer and User Facility Device Experience (MAUDE) database revealed events of vascular complications following application of tubular retention dressings on digits including the thumb. Although a small number of cases were reported in the MAUDE and PA-PSRS databases, the events described indicated significant harm to patients, including amputation of digits. Facilities may reduce harm to patients by implementing processes to improve the safety of tubular retention dressings. An inventory of tubular dressing retainers in a facility can help target strategies to be implemented. Education for physicians, nurses, and other healthcare providers involved in the application of these dressings is essential. Patient education and instructions regarding these dressings are necessary to reduce harm. (Pa Patient Saf Advis 2008 Dec;5[4]:127-9.)

Improper application and use of the incorrect tubular dressing retainer size can cause significant harm to patients. A review of the PA-PSRS and U.S. Food and Drug Administration’s Manufacturer and User Facility Device Experience (MAUDE) databases identified cases of circulatory compromise associated with application of these dressing retainers. The reports identified in the databases described patients experiencing increased pain after application of the dressing and failure to seek further medical treatment, resulting in amputation of digits. Dressing retainers must be used properly for safe, high-quality patient care.

Reports of Patient Harm Associated with Use of Tubular Dressing Retainers
PA-PSRS

Since June 2004, PA-PSRS has received two reports indicating problems with tubular dressing retainers. The reports indicated that the patient’s circulation was compromised due to use of incorrect size and improper application of the dressing. The reports below illustrate harm to patients.

[Patient] came to the emergency department (ED) for laceration of finger. [The laceration was] treated for adhesive tape, which is a benefit for patients who

and [patient was] released. [The patient] returned for dressing being wrapped too tight. The wound assessment identified the wound to be healing satisfactorily. The finger was dressed with the wrong dressing size; tubular dressing retainer size 1 had been used as the dressing. [emphasis added] It was meant to be used as a single strip to hold the actual dressing in place. The area [appeared necrotic], requiring amputation of the finger tip.

The patient [was seen in] the ED for cuts on two fingers. [Patient] presented again [a few] days later with impaired vascular status of digits. The wrong dressing was used: tubular dressing retainer size 1. This was meant to be a single strip to hold the actual dressing in place; instead, it was used as the dressing. It got tighter with each successive application and turn of the metal ring. The patient was referred to a plastic hand [specialist] for surgery. The patient is currently undergoing physical therapy.

MAUDE

A search of the MAUDE database using the keyword search term “tubular dressing retainer” revealed five reports between 1992 and 1998 describing events of vascular complications following application of tubular dressing retainers on digits including the thumb. Similar to the PA-PSRS reports, the MAUDE reports describe patients complaining of increased pain during a two-to-three-day period after application of the dressing retainer. Removal of the dressing and reassessment of the wound did not occur until several days after the dressing was applied, despite early onset of pain. Vascular compromise was identified during reassessment, and symptoms ranged from discoloration of the digit to permanent disability and, in some cases, amputation of the digit.

Dressing Retainers

Dressing retainers are a valuable tool for wound care procedures. They are made of conforming, hypoallergenic, nonlatex, elastic material. The dressing retainers have built-in windows that afford a view of the primary dressing and are available in a variety of sizes adjusted to the circumference of different body parts.1,3

Tubular dressing retainers are easy to apply and remove. When properly applied, they are convenient and conform well to the shape of the bandaged part. When the proper size is used, they are comfortable for the patient.4 Dressing retainers are designed to keep dressings, creams, intravenous lines, and devices (e.g. splints) in place without causing discomfort to the patient. Tubular dressing retainers are to be applied in a single layer; they are not to be used as the tubular dressing itself. Retention dressings eliminate the need for adhesive tape, which is a benefit for patients who
have friable or sensitive skin. Tubular dressing retainers should not be used to apply pressure or be applied to edematous limbs. Dressing retainers are made of elastic, which does not provide compression but secures dressings. They do not provide support and will not help in shifting fluid.

**Circulatory Compromise**

A literature search revealed a limited number of articles and cases associated with tubular dressing retainers. Events involving these dressings appear infrequently in the literature and reporting systems, yet there is potential for significant harm to patients (i.e., compromised circulation requiring amputation). Circulatory compromise has been attributed to using the incorrect size and improper application of tubular retention dressings onto digits. Complications are the result of a tourniquet-type effect and occur due to application of the incorrect size, application of too many layers, and rolling or bunching of dressing elastic. Rolling occurs when the edges of the dressing roll together to form a constricting ring. Bunching occurs when the dressing bunches at the base of digits to produce a tourniquet effect. Complications include the following:

- Pain
- Edema
- Cyanosis
- Necrosis
- Amputation of digits

**Risk Reduction Strategies**

Facilities may reduce harm to patients by implementing processes to improve the safe use and application of tubular dressing retainers. Proficient bandaging skills are essential to reduce the risk of increased discomfort and pain or further injury. Facilities should check the type of tubular dressing retainers stocked and used within the hospital. Education for physicians, nurses, and other healthcare providers involved in the application of these dressings should include correct application and awareness of the mechanisms that may result in complications. Finally, patient education and instructions regarding these dressings are necessary to reduce harm.

Inventory assessment is conducted to identify the availability of tubular dressing retainers and to determine what departments use the dressing. Department managers can assess type and sizes of tubular retention dressings stocked in their area. An inventory can prompt managers to reevaluate the use of retention dressings and assess the appropriate sizes to stock. Establishing adequate stock and assigning appropriate staff to ensure that adequate supplies are available can reduce the risk of staff using the incorrect size. Additionally, with multidisciplinary input, facilities can determine which departments are appropriate to stock the dressings and to provide education to all staff applying the dressings.

Staff education involves all healthcare providers using the dressings. A small reminder card may be attached to the tubular dressing retainer box, clearly posted in the storage areas where the dressings are located, and/or can be easily carried by practitioners who use these dressings. Include the following points when educating staff:

- Choose the appropriate size for the anatomical area.
- Because manufacturers’ recommendations may not always be reliable, use clinical judgment and common sense when choosing the appropriate size.
- Apply only one layer of tubular dressing retainer to secure the dressing over the wound.
- Apply retention bandages from joint to joint to prevent tightness and discomfort.
- Provide healthcare workers the opportunity to practice applying the dressing to different anatomical areas on each other.
- Require an annual retraining for staff applying tubular dressing retainers.

(Refer to the Figure for correct application of tubular dressing retainers.)

**Accompanying Patient Safety Tool**

Visit the Pennsylvania Patient Safety Authority Web site to view or obtain “Tips for Application of Tubular Dressing Retainer,” a quick reference card based on this article that can be carried by practitioners who apply tubular dressings or kept with the materials.
Patient education is a fundamental component to prevent harm from retention dressings. The majority of patients with tubular retention dressings are cared for in an outpatient setting. Patients will need to be made aware of signs and symptoms of problems and what to do if they occur. The following points are pertinent for written instructions provided to the patient:

- Elevate the bandaged extremity above heart level for the first 24 hours to decrease swelling.¹
- Examine exposed skin surrounding the retention dressing for color and temperature.¹
- Remove tubular dressing immediately in response to increased pain, and seek emergency care.¹

Tubular dressing retainers provide an easy method to secure nonadhesive dressings, especially on difficult anatomical areas such as digits, chins, knees, and elbows. When properly applied, the dressing retainer promotes healing and provides patient comfort. However, when these dressings are applied inappropriately, they can cause significant harm to patients. Proper education to healthcare workers and understandable instructions to patients are strategies facilities may implement to reduce the risk of harm to patients.

Notes
