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In this issue

a world of expert professional nursing care for people with ostomy, wound or continence needs

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WCET™: a world of expert professional nursing care for people with ostomy, wound or continence needs.

Oral endotracheal tube securement device reduces incidences of accidental self-extubation and medical adhesive-related skin injury (MARSI) in an ICU

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ABSTRACT:

Oral endotracheal tube (ETT) insertion is one of the most common procedures in the intensive care unit (ICU) and frequently critical care areas where there is a need for such devices to provide respiratory support. Usually in such procedures, the ETT is inserted and then secured with a form of medical adhesive material (such as a tape) or a cloth tie. Oftentimes these devices, when not secured properly, may result in accidental extubation of the ETT, leading to respiratory distress and possibly even more severe consequences, such as the patients' death. This article describes the introduction of a new ETT securement device into our 800-bed hospital located in metropolitan Manila in The Philippines, and discusses its impact in our clinical settings in reducing incidences of both MARSI and unplanned extubation.

Keywords: *Medical device, skin injury.*

INTRODUCTION

Oral endotracheal tube (ETT) insertion is one of the most common procedures in the intensive care unit (ICU) and frequently critical care areas where there is a need for such devices to provide respiratory support. Usually in such procedures, the ETT is inserted and then secured with a form of medical adhesive material (such as a tape) or a cloth tie. Oftentimes these devices, when not secured properly, may result in accidental extubation of the ETT, leading to respiratory distress and possibly even more severe consequences, such as the patients' death[1].

Accidental self-extubation can also be considered as a *'sentinel event'* that is considered one of the hospital's Quality Indicators when it comes to patients' safety. Other issues concerning placement of the ETT are the medial adhesive-related skin injuries (MARSI) that may result from the use of strong adhesive tapes for securing these tubes. MARSI is defined as an occurrence in which erythema and/or other manifestation of cutaneous abnormality (including, but not limited to, vesicle, bulla, erosion, or tear) persists 30 minutes or more after removal of the adhesive[2].

This article describes the introduction of a new ETT securement device into our 800-bed hospital located in metropolitan Manila in The Philippines, and discusses its impact in our clinical settings in reducing incidences of both MARSI and unplanned extubation.

BACKGROUND — TRADITIONAL METHODS OF ETT SECUREMENT

Traditionally an ETT is secured using one or more of the following methods:

- Cloth tapes or ties
- Velcro securement devices
- Other medical adhesive tapes

However, there are recorded and experiential disadvantages as well as concerns with traditional securement methods. These can include the following concerns.

Cloth tapes and other adhesive tapes are usually changed daily, thereby potentially increasing the risk of accidental extubation during such procedures. Time and motion studies with daily tape changes also indicate a cost impact due to increased nursing time to change tapes, accidental extubation events, and potential skin damage from frequent skin stripping[3]. Cloth tapes, once applied, can cause facial

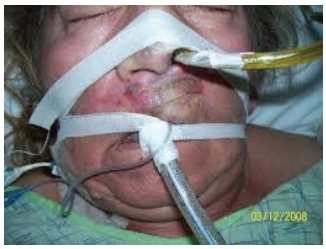

Figure 1: Cloth tapes securing ETT deforming the facial structure

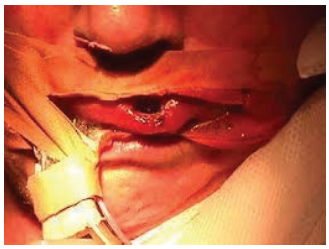

Figure 2: Adhesive tapes securing the ETT and pilot tube together to the face

deformation of the patient, which can be distressing for the relatives of the patients as their distorted features can make their relatives unrecognisable (Figure 1).

Strong adhesives on tapes can result in health care workers oftentimes using scissors to cut the tapes away from the face (Figure 2). Apart from the potential to damage facial skin or cause other injuries, this method may accidentally lead to severing the pilot tube of the ETT, thus deflating the cuff, leading to inadequate oxygenation or to an accidental extubation event that now requires an ETT change.

Secretions coming from the oral cavity may also be absorbed by these traditional securement methods and when these secretions remain on the skin for prolonged periods, may lead to maceration of such areas. This can, in turn, create moisture-associated skin damage (MASD)[4] to the surrounding skin and the lip of the patient.

All of these concerns were taken into consideration when deciding to review our current management methods of ETT securement.

STUDY METHODS

After we reviewed our current methods and policies of ETT securement, we searched for alternative product options. After some research, the AnchorFast™ Oral Endotracheal Tube Fastener[5] (Hollister Incorporated, Libertyville, IL, USA) was the device chosen to secure the ETTs of five patients admitted in the ICU and acute stroke unit (Figure 3).

IRB approval was not required as this was not an experimental product, but rather a user evaluation of acceptability for use by our hospital. However, the device was routed through our usual internal value analysis committee for assessment and suitability prior to use.

With the initial success on the five previously described patients, it was later recommended for wider use in the various areas in the hospital where the use of an ETT is possible. This ultimately led to the inclusion of this device as part of the hospital protocol as securement of the ETT was simple, secure and access to the oral cavity for routine mouth care was easier (Figure 4).

A training program was initiated to all of the potential users of the device in our institution — from unit staff, head nurses, nurse supervisors, and to clinical instructors. Subsequent training also included a return demonstration of the actual securing of the device to a mannequin head, and product education on the basic components of the device.

STUDY RESULTS

Five initial patients were selected in the latter part of 2015 (December) to first determine product acceptability by our institution. This then required some internal product evaluation by our product committee before we could take the next steps. The actual retrospective study took place in the latter part of 2016, where a total of 20 intubations during that year were compared using the device over a six-month period versus the prior six months without the device (utilising retrospective medical record data). The results during this six-month period were remarkable and illustrated a significant lessening of both incidences of MARSI and unplanned/accidental extubations. *(Note: Six patients out of 26 experienced neither MARSI nor unplanned extubation and are not included in Table 1.)*

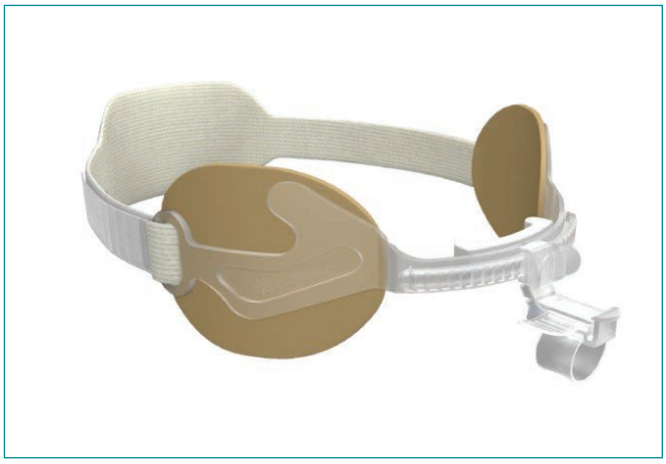

Figure 3: AnchorFast™ product. Image courtesy of Hollister Incorporated

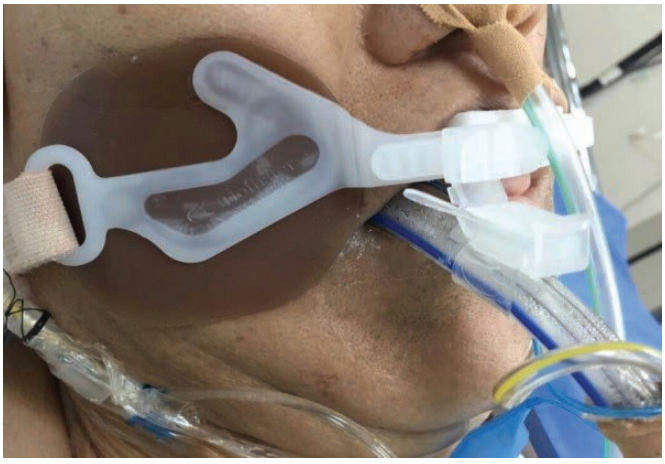

Figure 4: Device in situ