The use of a Cyanoacrylate based skin barrier* in the protection of the skin around a tracheostomy

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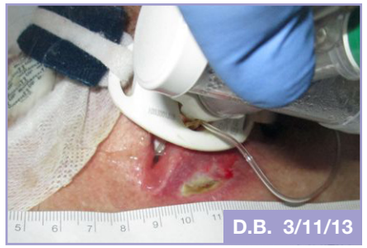
INTRODUCTION

The creation of a tracheostomy to ease breathing is associated frequently with leakage of fluids onto intact skin around the insertion point. Such constant exposure to fluids tends to corrode skin putting patient welfare at risk. In patients with more challenging peristomal tracheostomy issues, we have found that traditional interventions are unable to manage this usually intractable problem. We have had remarkable results with a new skin barrier based on medical superglue (cyanoacrylates) in other skin protection applications and this knowledge led us to consider a trial on a convenience sample of eleven patients with skin damage around the tracheotomy insertion site. Such patients are frequently admitted in our Long Term Acute Care (LTAC) facility.

METHODS

Upon admission, with any evidence of skin damage around the puncture wound, we assessed the extent of the skin damage, and then applied the Cyanoacrylate* per the instruction for use on the "at risk" or damaged skin, taking care not to get the material into the airway. The skin protectant was re-applied as needed. Skin health was noted on patient charts and photographic images were captured.

Initials	Age	Gender	Start size (length x width)	End size	Days	Pre-Albumin	Albumin	Braden	Co-morbidities
LN	86	M	1.9 x 0.5	0.6 x 0.3	17	15	2.1	16	MVA, respiratory failure, multiple cardiac arrests, CVA
BB	43	F	1.1 x 2	1 x 1.5	6	16	2.2	11	CVA, aspiration pneumonia, Chronic Kidney dx, DM2
CF	51	M	1 x 4	0.4 x 0.1	11	5	1.8	13	CP, mental retardation, dysphagia, Failure to thrive, peritonitis, vasopressors, TPN
CL	61	F	0.5 x 2.2	0.3 x 0.8	8	12	2.3	16	Hepatitis, cirrhosis, s/p liver transplant, sepsis, ARDS, GERD, breast cancer
CO	79	F	2 x 2	0.8 x 0.8	7	13	1.9	13	Upper GI bleed, hemorrhagic shock, perforated hernia, vasopressors, TPN
DB	63	M	2.5 x 0.9	0.5 x 0.3	14	17	2.5	13	Necrotizing MRSA pneumonia, seizure disorder, DM, Hyperlipidemia
DM	69	F	1 x 1	0.5 x 0.6	7	13	2.9	17	CHF, sepsis, vasopressors, pneumonia, COPD, tobacco abuse, PEG/TF
DP	36	F	1.3 x 0.6	0.9 x 0.1	5	29	3.2	15	Seizure, aspiration pneumonia, pulmonary edema, developmentally delayed, PEG/TF
EM	78	F	1.4 x 0.4	0.8 x 0.2	8	13	2.7	14	MVA, multiple orthopedic injuries, VAP, A. Fib, tardive dyskinesia, heavy tobacco use, NGT/TF
HA	74	M	2 x 4	0.9 x 0.1	2	18	2.9	14	COPD, pneumothorax, HTN, tobacco use, NGT/TF
HC	75	M	2.5 x 0.6	0.8 x 0.3	53	29	1.9	14	Thrombolytic occlusion, alvelor hemorrhage (Aspergillus), CVA, CHF, splenectomy, PEG/TF
	65	5 M,6 F			12.5	16.4	2.4	14.2	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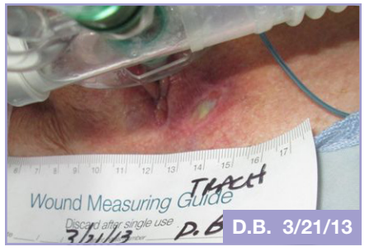

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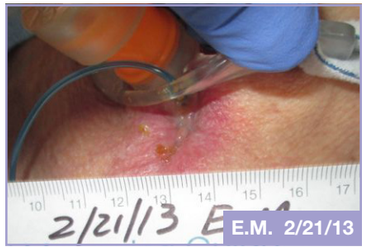

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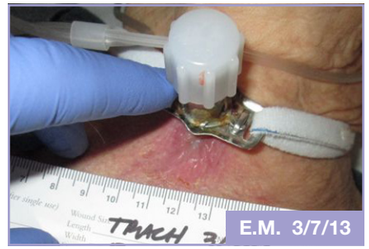
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DISCUSSION

Of the eleven patients treated with the cyanoacrylate skin barrier to the peri-tracheostomy sites, five were male and six female. The average age of these long-term acute care patients was 65 with a range of 36-79 years of age. Initially, the cyanoacrylate was applied three times per week, but with staff comfort and familiarity, we felt that two times per week was adequate frequency of application. The days to discontinuing the cyanoacrylate averaged 12.5, with one outlier of 53 days. Considering the other 10 patients, the average to discontinuing the cyanoacrylate was only 8.5 days. The average Braden score for this study group was 14.2, which is considered "Moderate Risk" for pressure ulcer development. Among the comorbidities are diabetes, COPD, nutritional support, CVA, developmental issues, s/p liver transplant, vasopressors and kidney disease and GERD.

RESULTS AND CONCLUSION

Skin improvement was observed for all 11 patients enrolled in this study. The details on the medical conditions of the patients are shown in Table 1. We found that the skin protectant did not cause pain or stinging, and dried in usually less than a minute. Application of the barrier still allowed easy routine care using normal saline and gauze in every shift. We found that the polymeric film does disappear over time, primarily during the process of wiping down body fluids leaking around the breathing device. We did not notice any problems around the ingress of the barrier, either during application, or between applications, into the airways. This product is one we may consider as an alternative skin protectant in management of tracheostomy peristomal skin challenges. Cyanoacrylates are a new class of skin protectant and our primary concern is patient safety. In this multipatient study we did not find any adverse events. Nursing care time was significantly reduced in our opinion during the use of the cyanoacrylates, and we would like to propose a health economic study to determine the nature of savings that this type of advanced product can bring into the care of nosocomial conditions.

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