



wet - moist  
wound

## ALGIDEX AG<sup>®</sup> FOAM

silver alginate foam dressing



moist - dry  
wound

## MULTIDEX<sup>®</sup> GEL

maltodextrin wound dressing

# Enhanced Tracheostomy Wound Healing Using Maltodextrin and Silver Alginate Compounds in Pediatric Patients<sup>1</sup>

## abstract

**Introduction:** Tracheostomy surgical and pressure wounds are common challenges encountered in children. Historically, few treatments have been available for this problem. Frequently, barriers are utilized with modest benefit, which often results in a protracted healing course. The combined use of a silver alginate sponge with hydrophilic maltodextrin NF compound has been found to rapidly promote healing without compromising safety.

**Methods:** Retrospective review of inpatients treated in a tertiary care facility over a 10 month time period. Results: 9 subjects were identified. The average age was 5.8 years. The most common wound location was at the infrastomal region (N = 6). Wound staging identified 4 as stage 2, 4 as stage 3, and 1 as stage 4. The average length of treatment was 14.1 days. All wounds achieved complete healing. No adverse effects were identified.

**Conclusions:** The combined use of maltodextrin with a silver alginate sponge provides a highly effective and safe treatment for tracheostomy wound healing.

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## introduction

Wounds related to tracheostomies are common in the immediate postoperative period as well as in outpatient follow-up in pediatric patients. Tracheostomy-related wounds is a particular problem in children due to the shorter necks, increased movement and the routine use of firm and inflexible methods to secure the tube. This results in areas of pressure and friction that frequently result in open wounds. While no standardized prevention or treatment methods have been described in the literature, the majority of tracheostomy-related wounds have traditionally been managed with the use of barrier gauze or sponges and at times with antibiotic ointment or creams. The healing of these wounds frequently follows a protracted course requiring extensive nursing time. Significant morbidity such as pain and discomfort may also result. The use of maltodextrin gel (MD; Multidex<sup>®</sup>; DeRoyal<sup>®</sup>) and silver alginate foam pads (AG; Algidex Ag<sup>®</sup>; DeRoyal<sup>®</sup>) has been approved at our institution for the care of tracheostomy-related wounds. These treatments, MD and AG, and related products have been found to be safe and effective through multiple clinical trials.

## methods

- Retrospective chart review
- Tertiary Care Facility (Arkansas Children's Hospital)
- Inclusion: Inpatients treated with AG and/or MD for tracheostomy-related wounds at Arkansas Children's Hospital from 12/29/09 through 11/2/10.
- Exclusion: Patients treated with AG and/or MD as an outpatient

## results

**9 subjects:** Average age 5.8 years (range 0.25 to 15.6 years). Median age 3.2 years.

**Wound location:** infrastomal region (N=6), stoma (N=2) and lateral neck (N=1).

**Wound staging at start of treatment:** stage 2 (N=5), stage 3 (N=4), and stage 4 (N=1).

### Treatment:

- Average length of treatment 14.1 days (range 6 to 28 days). Median length of treatment 12.0 days.
- 8 out of 9 patients had the combination of MD and AG treatments; 1 patient treated with MD alone
- Each patient's wound achieved complete epithelialization by the completion of treatment.

**No adverse effects** from the MD and AG treatments were identified.

# Representative Cases

## patient 1



- **Patient 1:**  
*ES Stomal and  
Infrastomal wound.  
Before Tx.*



- **Patient 1:**  
*ES After 28 days  
of AG + MD*

## patient 2



- **Patient 2:**  
*MG Infrastomal  
Wound. Before Tx.*



- **Patient 2:**  
*MG After 10 days  
of AG + MD*

## patient 3



- **Patient 3:**  
*MP Right Lateral  
Neck Wound.  
Before Tx.*



- **Patient 3:**  
*After 3 days  
of AG + MD*

## discussion

In the pediatric population, pressure and friction-related wounds secondary to the tracheostomy tube and ties are frequently encountered and require special attention. Tracheostomy-related wounds have no standard treatment and very little can be found in the literature about management of these unique wounds. While traditional sponge and gauze barriers present a viable solution, the healing course is often lengthy and challenging. Due to their location in the respiratory tract and the absorptive properties inherent in this region, careful attention needs to be paid to the treatments administered. Maltodextrin gel (MD; Multidex®) and silver alginate foam pads (AG; Algidex Ag®) are commercially available for use on tracheostomy-related wounds. After approval through the products evaluation committee, we commenced with utilization of these products over a year ago and have noted a remarkable decrease in length of treatment with an average duration of 14.1 days in the 9 cases reviewed here. We identified no adverse effects from the use of these products. Prospective trials are now underway to evaluate the objective benefits of this novel treatment compared to standard methods.

## conclusions

The novel use of maltodextrin gel and silver alginate foam pads is both a safe and effective treatment for pediatric tracheostomy-related wounds.



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## References

1. Industry-sponsored study. This information does not imply approval or endorsement by any referenced healthcare practitioner or facility.
2. Khattak, AZ, et al. A randomized controlled evaluation of absorption of silver with the use of silver alginate (Algidex) patches in very low birth weight infants with central lines. *J of Perinatology* 2010; 30:337-342.
3. Madeo M, et al. A randomized trial comparing Arglaes (a transparent polyurethane dressing) to Tegaderm (a transparent polyurethane dressing) for dressing peripheral arterial catheters and central venous catheters. *Intensive Crit Care Nurs* 1998; 14:187-191.
4. Meaume S, et al. Evaluation of a silver-releasing hydroalginate dressing in chronic wounds with signs of local infection. *J Wound Care* 2005; 14:411-419.
5. Ricketts CR, et al. Mechanism of prophylaxis by silver compounds against infection of burns. *Br Med J* 1970; 2:444-446.
6. Presented at ASPO 2011. Published in *Respiratory Care*, December 2014 Vol. 59 No. 12

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