

Nasal Decolonization in Plastic and Maxillofacial Surgery with a Two-Step Alcohol- Based Nasal Hygiene Method

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INTRODUCTION:

Endogenous bacteria are known to be the primary causative agent in postoperative surgical site infections¹. The nose and nasal vestibules are a rich source of endogenous bacteria and have been linked as a primary source for infectious organisms^{2,3}. Nasal decolonization is an evidence-based intervention that has been shown to be effective in the reduction of healthcare associated infections (HAIs). Surgical nasal decolonization studies have demonstrated a reduction in surgical site infections (SSIs) in orthopedic and cardiothoracic surgery^{4,5,6}.

Reviews of the efficacy of nasal decolonization in plastic and maxillofacial surgery are lacking. This study evaluated a commercially available non-antibiotic, alcohol-based nasal hygiene device and methodology for reducing the presence of nasal vestibular *Staphylococcus aureus* and Methicillin resistant *Staphylococcus aureus* (MRSA) in a consecutive series of patients undergoing elective plastic or maxillofacial surgery.

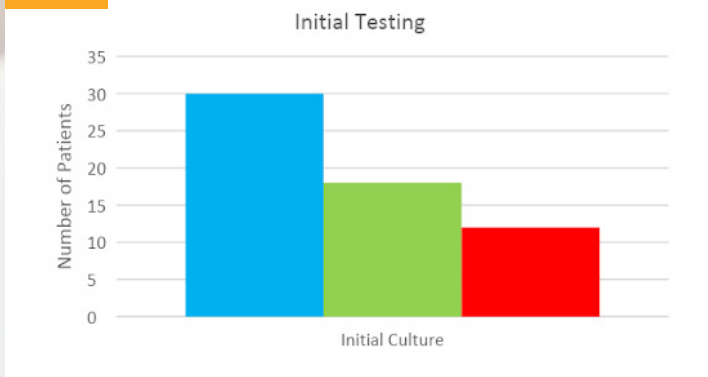
METHODOLOGY:

All adult patients, ages 17 years and older over a three-month period, from December 2023 through February 2024, scheduled for elective plastic or maxillofacial surgical procedures received an anterior nasal vestibular swab culture at least two weeks prior to their scheduled surgery date (Table 1). All vestibular swabs were analyzed by polymerase chain reaction (PCR) for the identification of *Staphylococcus aureus* and methicillin resistant *Staphylococcus aureus* (MRSA).

All patients whose PCR testing was positive for *Staphylococcus aureus* or MRSA were then treated with a seven-day course of SaniiSwab, a commercially available, over the counter (OTC), two-step alcohol-based nasal hygiene method. Patients were supplied with fourteen nasal hygiene products and instructed to perform the nasal hygiene technique two times per day (BID), once in the morning and once in the evening.

At the end of their 7-day nasal hygiene cleansing a repeat anterior nasal vestibular swab was obtained and examined by polymerase chain reaction (PCR) for the identification of *Staphylococcus aureus* and methicillin resistant *Staphylococcus aureus* (MRSA).

TABLE 1



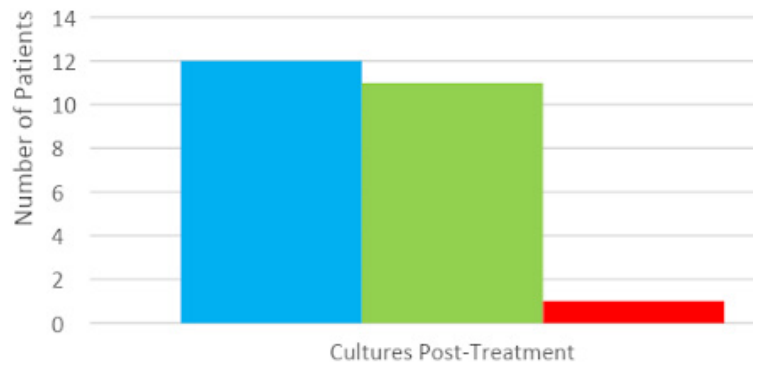
RESULTS:

Thirty consecutive preoperative adult patients undergoing plastic (soft tissue only, n = 18) or maxillofacial (soft and skeletal tissue, n=12) had an anterior nasal vestibular PCR culture. In twelve of the thirty patients (40%) the PCR culture was positive for *Staphylococcus aureus*. Four of the patients positive for *Staphylococcus aureus* were also positive for MRSA.

After seven consecutive days of the twice per day nasal hygiene cleaning method, eleven patients who were initially positive for *Staphylococcus aureus* tested negative for *Staphylococcus aureus* with their repeat anterior nasal vestibular swab (Table 2). The four patients who were positive for both *Staphylococcus aureus* and MRSA were all negative for both organisms in the repeat anterior nasal vestibular culture after the nasal hygiene method.

TABLE 2

After 1 week of SaniiSwab BID Treatment



11 of 12 consecutive patients converted from positive to negative for *Staphylococcus aureus* and MRSA following the seven-day, twice per day (BID) nasal hygiene treatment.

DISCUSSION:

The principal organism involved in many postoperative surgical site infections in plastic and maxillofacial surgery, as well as most other surgical specialties, is *Staphylococcus aureus*^{8,9}. Preoperative nasal decolonization has been shown to be effective in the reduction of nasal vestibular endogenous *Staphylococcus aureus*, and in a corresponding reduction

in the incidence of postoperative surgical site infections (SSIs). Lacking in plastic and maxillofacial literature is a demonstrated effective, simple universal method that can be safely used for nasal decolonization in presurgical patients.

Current agents available for nasal topical decolonization were considered, including mupirocin and povidone-iodine (PI). Mupirocin, a topical antibiotic, has been proven effective for topical *Staphylococcus aureus* nasal decolonization, however, its widespread use has led to mupirocin resistant strains of *Staphylococcus aureus*⁶. Povidone-iodine is bactericidal and viricidal, but professional supervision is required for use, it is not available over the counter (OTC) and can cause nasal irritation. Potential povidone-iodine allergy is also a concern.

The SaniiSwab two-step, alcohol-based method and device was selected for use in this nasal decolonization study. The antiseptic method has bactericidal activity against most gram-positive and gram-negative bacteria and is also viricidal. The application method is simple, easy to use, and follows the strict surgical principle of a two-step, dual prep technique. This nasal hygiene method is commercially available over the counter. Particularly helpful is that it is self-administered by the patient and does not require professional supervision for use. It is a non-antibiotic method, so bacterial resistance is not an issue.

The method used for evaluating the anterior nasal swabs was PCR or polymerase chain reaction identification. This technique evaluates a vortexed buffer solution that has been soaked in a nasal swab from the nasal culture. Through vortexing and heat, *Staphylococcus aureus* and MRSA colonies are fragmented, and their nucleic acid identified independently. Machine sensitivity and specificity both are rated by Cepheid at 95%. The use of PCR is considered the gold standard for detection of MRSA¹⁰.



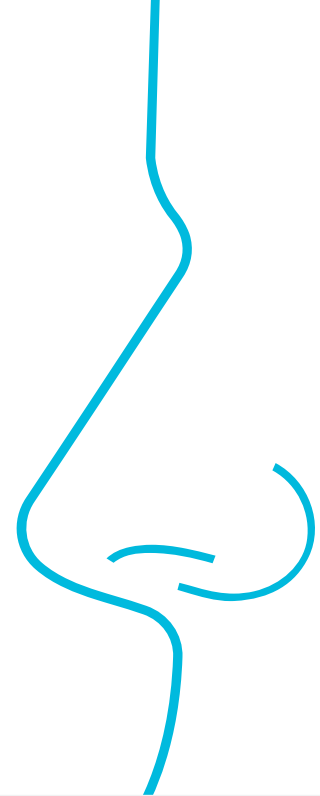
In this study, the SaniiSwab, two-step, alcohol-based nasal decolonization method demonstrated a 92% reduction in patients with nasal *Staphylococcus aureus* colonization.



CONCLUSION:

Eleven of twelve plastic and maxillofacial surgical patients were successfully decolonized using this method and underwent reconstructive surgery without development of an SSI.

This suggests the SaniiSwab, two-step, alcohol-based method of decolonization protocol should be universally integrated into the preoperative patient's multifaceted infection prevention plan to support SSI reduction for all surgical patients. Ongoing targeted studies should be conducted to determine if decolonization using this same method will impact the reduction of other hospital-acquired infections.



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