

Efficacy of Topical Application of Sealk on Post Tonsillectomy Pain Reduction

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Abstract

In America, there are over 500,000 tonsillectomy procedures occurring yearly.¹⁻² These surgeries are painful and create difficulties with swallowing and oral intake for up to 10-14 days. Post-tonsillectomy hemorrhage has also been a concern that has plagued Otolaryngologists. There is a growing concern with opioid consumption and trying to minimize opioids in the pediatric population as well as adults post-operatively. Currently, most patients are being discharged with acetaminophen, ibuprofen, and many with an opioid prescription.³ The purpose of the study was to apply Sealk to the tonsil bed during surgery to determine the reduction in pain. Sealk is an all-natural, plant based, biocompatible, water soluble, etherified carboxymethyl cellulose matrix that has shown superior hemostasis and fast wound healing. The Sealk patch, a hemostatic agent, used in this study was developed by LifeScience PLUS and has been cleared by the FDA since 2008. It has been used extensively in burn and trauma patients.⁴

Background

Tonsillectomy is one of the most common surgical procedures completed in the U.S. Tonsillectomy patients struggle with pain post-operatively and can also be at risk for post-tonsillectomy hemorrhage (PTH). A low cost and effective strategy to reduce pain and PTH has been elusive. Many materials have been applied to the tonsil beds post-operatively in attempts to reduce pain or bleeding.⁵ These products have failed to gain widespread utilization because of exorbitant cost or marginal benefit. Sealk, powered by BloodSTOP iX, has been used in the burn and trauma specialties for years. A tonsillectomy is essentially a traumatic burn to the oropharynx. Sealk, powered by BloodSTOP iX, has been shown to reduce inflammatory cytokines, reduce infection and

inflammation, while also increasing endogenous stem cells, promoting tissue regeneration.^{2,6} Sealk has been utilized for burn patients in protecting and sealing the wounds. Sealk has shown significant reduction in healing times, reduction in bleeding, and has full body indications.⁷ Sealk also has many qualities that are believed to be beneficial in the post-tonsillectomy oropharynx. Sealk provides rapid hemostasis.⁷ Sealk turns into an adhesive gel upon contact with blood, exudates, saline or even topical liquid therapeutic medications. The adhesive gel sticks to the tonsil bed and protects the area for a prolonged duration. Sealk is 100% bioabsorbable, biocompatible and biodegradable.

Methods

The objective of this study was to assess the effectiveness of Sealk applied to the tonsil bed in promoting healing and decreasing pain in post tonsillectomy patients. The effects of applying Sealk patches to post tonsillectomy wound sites were reviewed. Fifty post tonsillectomy patients ranging in age from eight to fifty-six years were studied. A single surgeon was utilized to minimize variability in technique. The surgeon performed an extracapsular tonsillectomy with electrocauterization. Every patient had similar anesthetic with dexamethasone upon induction. Patients also received similar amounts of Marcaine 0.25% with 1:200 epinephrine intraoperatively. At the conclusion of the operation, the patients were randomly administered a Sealk dressing on only one of their tonsil beds, the contralateral tonsil was used as the control. The Sealk was irrigated with saline to turn it into a sticky gel matrix. After eight to ten days, the patients were examined and the tonsil bed that received Sealk was compared to the untreated (control) tonsil bed. The patients recorded a pain score (1-10) for each tonsil bed. The patients also logged post-operative pain medication consumption for each day.

Results

Findings revealed that tonsil beds treated with Sealk healed faster and patients rated their pain to be less. Most patients noticed a reduction in pain on the tonsil bed treated with Sealk. 64% of the patients noted improvement in pain on the treated tonsil. Those patients that had reduction in pain showed a statistically significant reduction at 43% on the treated side. In this group, their reduction of pain was consistent from day 1-10. Of note, there was a greater improvement with patients older than 12 years of age.

Conclusion

Study results demonstrate that Sealk promotes healing and a reduction in pain post-tonsillectomy. We predict that Sealk will contribute to managing pain post-operatively. We propose with an upcoming study that Sealk will reduce use of postoperative narcotics and other analgesics. We realize the limitation of this study was the small sample size. We also learned that the younger patients were less able to verbalize which of the sides was less effected. Therefore, our upcoming study will treat patients bilaterally and will focus on patients

older than 12. Further knowledge gained in over 2,500 post tonsillectomy cases treated with Sealk is that there have been no complaints of increased laryngospasm, aspiration, or post tonsillectomy hemorrhage. Sealk is a safe and effective hemostat for tonsillectomy, with initial study data showing significant reduction in post-operative pain and improvement in healing. There may also be some benefit in reducing post tonsillectomy hemorrhage although a much larger study would be needed to demonstrate this.

Citations

1. Cullen KA, Hall MJ, Golosinksiy A. Ambulatory Surgery in the United States, 2006. 2009. Pub Med. Google Scholar.

2. Darrow DH, Siemens C Indications for tonsillectomy and adenoidectomy. Laryngoscope. 2002; 112 (S100):6-10. Doi:10.1002/lary.5541121404.PubMed. CrossRef. Google Scholar.z2021 Jul;7(3): 186-193. Published online 2021 May 29. Doi 10.1016/j.wjorl.2021.03.004

4. Ju S, Wang K, Qiao L et al. Application of BloodStop iX Wound Heal Nanocellulose Matrix for Burn Wound Care. J Surg Res (Houst). 2021;04(01). Doi:10.26501/jsr.10020105

5. Liu L, Rodman C, et al. Topical Biomaterials to prevent post-tonsillectomy hemorrhage. J Otolaryngol Head Neck Surg. 2019; 48:45. Published online 2019 Sep 6. Doi:

6. Peng D, B. Reed- Maldonado A, Banie L, Wang G, Lin G, F. Lue T. Carboxymethylcellulose Activates Dermal Cells and Adipose- Derived Stem Cells Through Wnt/B-catenin Pathway. J Surg Res (Houst). 2021;04(01). Doi:10.26502/jsr.10020117

7. Ethox International, Rush, NY, Hemostasis Assessment of BloodSTOP, BloodSTOP iX, GLP-2006-0332, 2006.

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