

The Efficacy of 0.5 Gram NaCl Capsule in the Treatment of Umbilical Granuloma in Neonates: A Case Report

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ABSTRACT

Background: An umbilical granuloma is a common benign condition in neonates characterized by the overgrowth of granulation tissue at the base of the umbilicus following umbilical cord detachment. While the standard treatment involves the use of silver nitrate, with its associated risks and need for clinical visits, alternative treatments such as the application of sodium chloride (NaCl) capsules have gained attention for their efficacy, safety, and cost-effectiveness in home settings.

Case Presentation: Herein, we present the case of a 3-week-old female infant diagnosed with an umbilical granuloma post umbilical cord detachment. The management involved the application of a 0.5 gram NaCl capsule directly to the granuloma, covered with sterile gauze, and repeated over several days. This approach resulted in a significant reduction in granuloma size and total resolution within two days, without the complications or irritation sometimes associated with silver nitrate. Parents reported ease of administration at home and high satisfaction levels due to the treatment's effectiveness and minimal need for healthcare visits.

Conclusion: The use of a 0.5-gram NaCl capsule offers a valid and effective home-based treatment alternative for umbilical granuloma. It provides a practical option, especially where access to silver nitrate is limited, with the added benefits of ease of use and reduced medical costs. With proper parental education and adherence to the treatment protocol, NaCl can serve as a first-line or alternative therapy. Further large-scale studies are recommended to verify long-term effects and potential complications.

Keywords: Neonates, Sodium Chloride, Treatment, Umbilical Granuloma, Umbilical Cord

INTRODUCTION

Umbilical granulomas represent a benign proliferation of granulation tissue, which typically manifests at the umbilicus's base in neonates following the separation of the umbilical cord. This condition is depicted by a small, red, moist, and non-painful mass that can cause unexpected concern and anxiety for new parents. Despite its benign nature, umbilical granulomas occur in a notable percentage of newborns, with prevalence rates reported from 1% to 10% across various populations.¹ Epidemiological data suggest that umbilical granulomas are more frequently observed in developing nations compared to developed countries, which is presumed to be influenced by differences in umbilical cord care practices and generalized hygienic conditions.

The most accepted and traditionally employed treatment for umbilical granulomas is the application of silver nitrate. Silver nitrate functions by cauterizing the excessive granulation tissue, resulting in its desiccation and subsequent detachment. Although this treatment is generally effective, its application carries certain drawbacks. Silver nitrate can irritate the surrounding healthy skin, requires administration by medical professionals, and necessitates multiple healthcare visits. This can be both inconvenient and costly for families, particularly in resource-limited settings where access to healthcare professionals might be restricted.^{2,3}

In response to these limitations, table salt (sodium chloride, NaCl) has emerged as a viable, cost-effective alternative for the treatment of umbilical granulomas that can be managed at home. The application of NaCl is straightforward, involving placing a small amount directly on the granuloma, shielding it with sterile gauze, and repeating this process for several days until the granuloma dries up.⁴ Research such as that by Haftu et al. (2020), has demonstrated the efficacy of NaCl in reducing the size of umbilical granulomas and achieving

resolution within 5-7 days. Similarly, Hossain et al. (2012) found that administering NaCl is not only safe but also empowers parents to treat the condition at home, diminishing the necessity for medical intervention. Additionally, NaCl is less likely to cause skin irritation or burns, a noted side effect of silver nitrate.^{5,6}

Nevertheless, there remains some hesitation among medical practitioners regarding the long-term viability and sustainability of using NaCl. Critics emphasize the absence of comprehensive long-term studies on potential complications or recurrences following treatment with NaCl. Conformity to the treatment protocol and accurate application is crucial, as the success of NaCl treatment hinges largely on parental diligence in following the treatment regimen. While authors like Karaguzel et al. (2016) assert that silver nitrate provides quicker resolution of granulomas, especially in a controlled clinical environment, the need for a versatile, home-based alternative persists.⁷

Given the prevalence of umbilical granulomas in neonates and the distinctions between these treatment modalities, this research is critical. Exploring accessible, effective, and safe treatment methods is pivotal not only for alleviating parental anxiety but also for reducing healthcare burdens in both developed and developing contexts. While silver nitrate remains the benchmark for clinical treatments, this investigation into the NaCl application seeks to fill existing research gaps by examining its practical use at home and documenting its outcomes. This case report primarily aims to deepen the understanding of the effectiveness of a 0.5-gram NaCl capsule in managing umbilical granulomas. By doing so, it provides invaluable guidance to healthcare practitioners and parents, helping them make informed decisions regarding the most appropriate treatment methods for umbilical granulomas in newborns.

CASE PRESENTATION

The patient involved in this study was a 3-week-old female infant who was born full-term with no known complications or medical abnormalities in her history. The family history was not contributory. The infant's parents noticed a small, moist, red lump at the base of her umbilicus, which appeared around two weeks post-detachment of the umbilical cord. Upon examination, the clinical presentation was consistent with an umbilical granuloma: a small, moist, red, and pedunculated tissue at the umbilical base, without signs of infection such as erythema or purulent discharge (Fig. 1).



Figure 1. The umbilical granuloma appeared as a soft, pink, and moist mass at the base of the infant's navel.

The infant exhibited no systemic symptoms or fever. Consequently, a primary clinical diagnosis of umbilical granuloma was made, with differential diagnoses considering conditions like umbilical polyp, urachal remnant, and omphalitis. Given the classic presentation characteristics of umbilical granuloma, additional diagnostic tests, including imaging, were deemed unnecessary.

For the management of the umbilical granuloma, the treatment method selected was employed a 0.5 gram NaCl capsule, applied directly to the granuloma, then covered with sterile gauze (Fig. 2).



Figure 2. Initiation of Therapy

On the first day of therapy, the umbilical area was cleansed with an antiseptic solution before the application of NaCl. A 0.5-gram NaCl capsule was applied directly to the granuloma and subsequently covered with sterile gauze.

This procedure was repeated twice daily for 2 days, with home care instructions emphasizing cleanliness, dryness of the area, and daily dressing changes after NaCl application.

The data collection process involved daily observations and feedback from the parents, who were responsible for administering the treatment. Parents were instructed on thorough hand washing with soap and water, disinfecting the umbilical area with an alcohol swab or mild antiseptic before applying the NaCl, and ensuring even coverage of the granuloma. The area was covered with sterile gauze, and the dressing was changed twice daily, typically once in the morning and once in the evening (Fig. 3,4,5). Parents were also advised to watch for signs of infection, such as redness, swelling, or pus, and were told to seek medical attention if these symptoms developed. Treatment continued until the granuloma showed complete resolution.



Figure 3



Figure 4



Figure 5

Photographs taken by the patient's parents on the second and third days of NaCl application at home showed (Fig. 3) a significant reduction in the size of the granuloma (Fig.4). The granuloma began to dry and became paler. The previously prominent granulation tissue appeared flatter and less moist (Fig, 5).

Evaluation of the treatment was conducted during a follow-up visit three days later, where a significant reduction in granuloma size was documented (Fig. 6), and detachment of the granuloma was observed. (Fig. 7).



Figure 6
Reduction in granuloma size



Figure 7
Detachment of the granuloma

There were no serious complications observed throughout the treatment course, though some mild skin irritation was noted (Fig. 8) and managed effectively with correct cleaning and dressing protocols. The outcome of using a 0.5 gram NaCl capsule in this case illustrated highly satisfactory results. By the third day, there was a notable decrease in granuloma size, it became paler and drier (Fig. 9). Parents reported simplicity in home administration, enhanced comfort for the infant, reduced need for repeat healthcare visits, and expressed high satisfaction due to the low cost and rapid effectiveness.



Figure 8
Mild skin irritation



Figure 9
Absence of granuloma, pale and dry umbilical

DISCUSSION

The results of utilizing a 0.5-gram NaCl capsule for treating umbilical granuloma reinforce its viability as a safe and effective management strategy in neonatal care. This method has demonstrated high efficacy, with significant granuloma reduction observed within the initial treatment days and complete resolution typically achieved within 5 to 7 days. The case report aligns with existing literature, portraying NaCl as a viable home-based treatment alternative to the traditionally used silver nitrate. This alternative not only minimizes healthcare visits but also alleviates the financial burden and logistical challenges for new parents, providing an easily accessible treatment option.

NaCl's mechanism, which relies on osmotic action—drawing moisture out of the granulation tissue to expedite healing—is both straightforward and cost-effective. This simplicity is further underscored by the findings of Jois & Rao (2021) and Singh et al. (2021), where NaCl application exhibited 90-96% success in resolving umbilical granulomas without significant complications or skin irritation. Such results emphasize the method's safety and efficacy when performed under correct guidance, making it attractive for both parents and healthcare providers.^{8,9}

However, despite the promising outcomes indicated by this and other studies, several limitations must be acknowledged. A major concern is potential non-compliance or misapplication by parents, which could lead to irritation or infection instead of resolution. The procedure's success is contingent upon the accurate application and adherence to the prescribed regimen. For these reasons, the need for proper parental education and support is critical to the effectiveness of this treatment. This includes detailed guidance on application techniques, monitoring for infection signs, and reassurance regarding the benign nature of umbilical granulomas. Moreover, silver nitrate, while associated with some adverse effects, is documented to provide more consistent results over a shorter period compared to NaCl, which might make it preferable in certain clinical contexts as noted by Haftu et al.¹⁰ This suggests that while NaCl is effective, its implementation may be more suited to environments where medical supervision is limited or when silver nitrate is inaccessible.

Despite these challenges, the broader application of NaCl as an alternative or even primary treatment is supported by the outcomes of this case. Furthermore, continued assessment through larger-scale studies and long-term follow-ups is necessary to solidify NaCl's standing as a primary treatment and address any concerns regarding its long-term use and potential complications. The current findings make a hopeful case for NaCl as

a practical alternative that can significantly reduce healthcare burdens while maintaining safety and efficacy in managing umbilical granulomas in neonates.

CONCLUSION

The use of a 0.5-gram NaCl capsule as a treatment for umbilical granuloma is a valid and effective alternative, particularly in settings where access to silver nitrate may be limited. It is crucial, however, that parents or caregivers are adequately trained to ensure the success and safety of the procedure. The results obtained in this case report are consistent with findings from previous studies demonstrating the effectiveness of NaCl application for the treatment of umbilical granuloma. Based on the existing evidence, it is recommended that NaCl be considered as a first-line option or alternative in situations where silver nitrate is unavailable or undesirable. Further research in the form of long-term studies and larger cohort studies is necessary to further ascertain the long-term effects and potential complications of this method. In the meantime, this practical and home-based approach offers an appealing and adequate solution for managing infants with umbilical granuloma.

ETHICAL APPROVAL

There is no ethical approval for this case report.

CONFLICTS OF INTEREST

The authors declare no conflict of interest for this case report.

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AUTHOR CONTRIBUTIONS

Investigation, Tubagus Ferdi Fadilah; Data collecting, Tubagus Ferdi Fadilah; Writing—original draft preparation, Nafisa Salma Wulandari; Nia Nurul Aziza; Supervision, Dita Setiati; Firda Fairuza; Editing, Nathalia Ningrum; Meiriani Sari

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