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Inflammation and infection

Successful healing of a suprapubic and inguinal necrotizing fasciitis in an 18-month-old girl using sugar dressings: A case report

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ABSTRACT

Necrotizing fasciitis (NF) is a severe infection, rare in pediatrics, often challenging to diagnose. An 18-month-old girl presented with fever and swelling after a minor cut. Over six days, her condition worsened, leading to the diagnosis of NF. Surgical debridement revealed extensive necrosis. After intensive care with sugar dressings and broad-spectrum antibiotics, her wound improved significantly. She was discharged after 21 days, emphasizing the importance of hygiene and timely medical care.

1. Introduction

Necrotizing fasciitis (NF) is a rapidly progressing soft tissue infection with significant diagnostic and therapeutic challenges. It is characterized by widespread necrosis of the fascia and subcutaneous tissues, often leading to systemic toxicity and high mortality rates if not promptly treated.[1] While NF predominantly affects adults, pediatric cases are rare and difficult to manage due to delayed diagnosis and limited pediatric-specific clinical guidelines.[2,3].

Management of NF typically involves aggressive surgical debridement, antimicrobial therapy, and supportive care. However, access to advanced wound care materials is often restricted in resource-limited settings, necessitating innovative approaches. One such method, sugar dressings, has demonstrated efficacy in promoting wound healing through its hyperosmotic properties, which inhibit bacterial growth, reduce edema, and encourage granulation tissue formation.[4] Despite its proven effectiveness, this approach remains underutilized in many low-resource healthcare settings.

This case report describes the successful treatment of suprapubic and inguinal necrotizing fasciitis in an 18-month-old girl using surgical debridement and sugar dressings. The report aims to highlight the utility of sugar dressings as a cost-effective and accessible wound management option in resource-constrained environments, contributing to the growing body of evidence supporting their use in clinical practice.

This manuscript was prepared following the CARE guidelines (https://www.care-statement.org).

2. Case presentation

An 18-month-old girl was admitted to the General Referral Hospital with a history of fever, irritability, and progressive swelling in the suprapubic area. The child's parents reported an initial small cut in the suprapubic and inguinal area sustained during a fall, which they managed at home with herbal remedies. After six days, the swelling increased and broke up by releasing purulent secretions and she developed a high fever, irritability, and difficulty sitting or lying down comfortably.

Upon admission, the child appeared acutely ill, febrile (temperature: 39.4°C), and lethargic. Physical examination revealed a solution of continuity in the suprapubic and left inguinal region leaving the muscles bear with some necrotic tissue and purulent secretions. The wound was surrounded by the edematous tissues. Palpation revealed crepitus, consistent with subcutaneous gas, and she demonstrated significant tenderness (Fig. 1).

Laboratory investigations showed the following:

- White blood cell count: 34,000/mm^3
- Neutrophils: 80 %; lymphocytes: 15 %; monocytes: 5 %
- Hemoglobin: 9.5 g/dL
- Blood glucose: 120 mg/dL

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Fig. 1. Extensive tissue necrosis with visible margins of demarcations in an 18-months-girl at the General Referral Hospital.

- Wound culture: Polymicrobial growth, including Streptococcus spp, Staphylococcus aureus and Escherichia coli.

A clinical diagnosis of suprapubic and inguinal necrotizing fasciitis was made. Immediate surgical debridement under general anesthesia was performed. Intraoperative findings included extensive necrosis of the subcutaneous tissues and fascia, requiring excision of the affected tissue until viable margins were achieved. The wound was left open and irrigated with sterile saline.

Given the resource constraints and lack of advanced wound care materials, sugar dressings were initiated as part of the post-operative wound management. Granulated sugar was applied directly to the wound, covered with sterile gauze, and secured with a dressing. This was changed twice daily, with thorough cleaning and debridement of any additional necrotic tissue during each dressing change.

The child was started on broad-spectrum intravenous antibiotics, including ampicillin, gentamycin, and metronidazole, which were adjusted seven days later based on wound culture sensitivity results. The sensibility to gentamycin and vancomycin. So, vancomycin was used intravenously for ten more days. She also received supportive care, including paracetamol for fever, intravenous fluids, and nutritional support.

The wound showed remarkable improvement, with the progressive development of healthy granulation tissue and a reduction in exudate and wound size (Fig. 2A over one week and Fig. 2B on day 11). The sugar dressings were continued until the wound margins had sufficiently contracted, after which secondary closure was performed on day 14.

The patient was discharged on day 21 in stable condition, with a clean, well-healed wound. She was followed up weekly for one month, during which the wound remained intact without signs of infection or dehiscence. The family was counseled on hygiene practices and the importance of seeking timely medical care in the event of future injuries.

3. Discussion

Necrotizing fasciitis (NF) is a rapidly progressive and life-threatening soft tissue infection, with high mortality rates, even with prompt treatment.[1,5] Pediatric cases are particularly rare and they present unique diagnostic and therapeutic challenges.[6] This case highlights the successful management of suprapubic and inguinal NF in an 18-month-old girl using sugar dressings, demonstrating the potential of this cost-effective wound care method in resource-limited settings.

NF is characterized by rapid bacterial invasion of the fascia and subcutaneous tissue, leading to widespread necrosis, systemic toxicity, and often multiorgan failure.[1,7] In children, the nonspecific early symptoms, such as fever, irritability, and localized swelling, often mimic other less severe conditions, leading to delayed diagnosis and treatment. In this case, the delay in seeking medical attention due to the initial use of herbal remedies exacerbated disease progression.

Early recognition and prompt surgical intervention are critical for improving outcomes. The clinical signs of necrosis, crepitus, and foul-smelling discharge were pivotal in diagnosing NF in this child. These findings underscore the importance of high clinical suspicion, particularly in low-resource environments where advanced diagnostic imaging may not be readily available.

The cornerstone of NF treatment is early and aggressive surgical debridement, coupled with appropriate antimicrobial therapy and supportive care.[1,3,6] However, the lack of advanced wound care materials, such as vacuum-assisted closure devices or bioengineered dressings, poses a significant challenge in low-resource settings.

In this case, sugar dressings were employed as an innovative wound management strategy. The hyperosmotic properties of sugar inhibit bacterial growth by drawing water out of microbial cells, reducing edema, and promoting granulation tissue formation.[4,8] This method is not only cost-effective but also readily available, making it particularly suitable for resource-constrained environments.

The successful healing observed in this case aligns with previous studies demonstrating the efficacy of sugar dressings in managing extensive wounds and infections.[4,8] The progressive reduction in wound size and the development of healthy granulation tissue highlight the potential of sugar dressings as a viable alternative in such settings.

The polymicrobial nature of NF, involving both aerobic and anaerobic organisms, necessitates broad-spectrum antibiotic coverage.[3] In this case, the initial empirical therapy with ampicillin, gentamycin, and metronidazole was effective, and culture results guided subsequent adjustments. This approach highlights the importance of tailoring antibiotic therapy based on local antimicrobial resistance patterns, particularly in settings with limited laboratory capacity.

This case underscores several key lessons for managing NF in resource-limited settings:

1. Timely diagnosis and intervention: Early recognition of NF and prompt surgical debridement are critical to improving survival and reducing complications.

Fig. 2. Same image (after a week -2A and on day 11 -2B) of the 18-month-old girl with significant improvement following debridement and aggressive antibiotic therapy.

2. Innovative wound care: Sugar dressings provide an accessible and effective alternative for wound management, particularly in facilities lacking advanced wound care resources.
3. Comprehensive care: Multidisciplinary management, including surgical, antimicrobial, and nutritional support, is essential for optimizing outcomes in pediatric NF.

While the outcomes in this case were favorable, the findings are limited to a single patient. Larger studies are needed to validate the efficacy of sugar dressings in managing NF, particularly in pediatric populations. Additionally, efforts to improve community awareness of NF and the risks of delayed treatment could help prevent similar cases in the future.

4. Conclusion

Necrotizing fasciitis (NF) is a rare but devastating condition in children, particularly in resource-limited settings where diagnostic delays and limited access to advanced wound care can worsen outcomes. This case stands as a testament to the potential of simple solutions to save lives and improve healthcare delivery in underserved populations.

CRediT authorship contribution statement

Roland Muyisa: Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Emile Watumwa:** Writing – review & editing, Writing – original draft, Visualization, Validation, Supervision, Software, Resources, Project administration, Methodology, Investigation, Formal analysis, Data curation, Conceptualization. **Charmante Pendeza:** Writing – review & editing, Writing – original draft, Data curation, Conceptualization. **Angelique Makelele:** Writing – review & editing, Writing – original draft, Visualization, Methodology, Formal analysis, Data curation, Conceptualization. **Marina Maha:** Writing – review & editing, Writing – original draft, Visualization, Data curation, Conceptualization. **Pascal Kalondero:** Writing – review & editing, Writing – original draft, Visualization, Validation, Methodology, Data curation, Conceptualization.

Consent

Written consent was obtained from the patient's parents/legal guardian for publication and any accompanying images. A copy of the written consent is available for review by the Editor-in-Chief of this journal on request.

Ethical approval

The Ethical Committee of the Hospital provided ethical approval for this study on December 1, 2024.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work, the author(s) used Grammarly AI to detect and correct language mistakes. After using this tool/service, the author(s) reviewed and edited the content as needed and take(s) full responsibility for the content of the publication.

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Conflict of interest statement

Authors have no conflict of interest to declare.

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