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CASE REPORT

Conservative management of a severe extravasation injury: A therapeutic nightmare

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ABSTRACT

Intravenous calcium gluconate is commonly used in neonatal intensive care units (NICU) to treat hypocalcemia in preterm infants, who are especially prone to metabolic disturbances. Although effective, it carries the risk of extravasation injury, which can lead to local tissue necrosis and, rarely, systemic complications such as septic shock.

We report a male preterm neonate (gestational age 31+4 weeks; birth weight 1750 g) who developed a significant extravasation injury following intravenous infusion of 10% calcium gluconate on day 1 of life for symptomatic hypocalcemia. Within 24 hours, progressive swelling and superficial skin and subcutaneous tissue necrosis extended from the dorsum of the right ankle to the knee. At presentation to our center on day 16 of life, the neonate was in septic shock, necessitating fluid resuscitation, inotropic support, and mechanical ventilation for 72 hours. Conservative wound management with daily dressing using normal saline and Vaseline gauze was undertaken. The patient's sepsis resolved with antibiotics, and gradual wound healing occurred without the need for surgical intervention.

Extravasation injuries from calcium gluconate are uncommon but can be severe, especially in preterm neonates with fragile skin and immature vasculature. Septic shock as a complication is rarely reported but highlights the critical need for vigilant monitoring. Management typically varies; however, this case demonstrates that timely conservative wound care, combined with supportive therapy, may result in favorable outcomes.

This report underscores the importance of prevention, early recognition, and multidisciplinary management to reduce morbidity in this vulnerable population.

INTRODUCTION

Intravenous calcium gluconate is frequently administered in neonatal intensive care units (NICU) to treat hypocalcemiain preterm infants who are vulnerable to metabolic disturbances.[1]Though beneficial, it carries the risk of extravasation injury, leading to local tissue damage ranging from erythema and swelling to cutaneous necrosis and calcinosis cutis and rarely sepsis and septic shock.[2,3]Premature neonates are vulnerable due to fragile skin and limited subcutaneous tissue, exacerbating the severity of extravasation injuries.[4]

This case report highlights such a severe occurrence in a preterm neonate, discussing clinical presentation, management, and emphasizing the importance of prevention, early recognition, and conservative care.

CASE REPORT

We report a male preterm neonate (gestational age 31+4 weeks; birth weight 1750 g) born by spontaneous vaginal delivery, who developed an extravasation injury on the dorsum of the right leg following intravenous infusion of 10% calcium gluconate administered on day 1 of life for symptomatic hypocalcemia.

Within 24 hours, there was progressive swelling followed by superficial skin and subcutaneous tissue necrosis extending from the dorsum of the right ankle up to the right knee (Figure 1).

At presentation to our center on day 16 of life, the infant was in septic shock; fluid resuscitation and inotropic support were initiated, and mechanical ventilation was required for 72 hours.

Wound care consisted of daily dressing with normal saline and

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Vaseline gauze. The sepsis improved with antibiotic therapy, and gradual wound healing was achieved without need for surgical debridement or grafting (Figure 2).

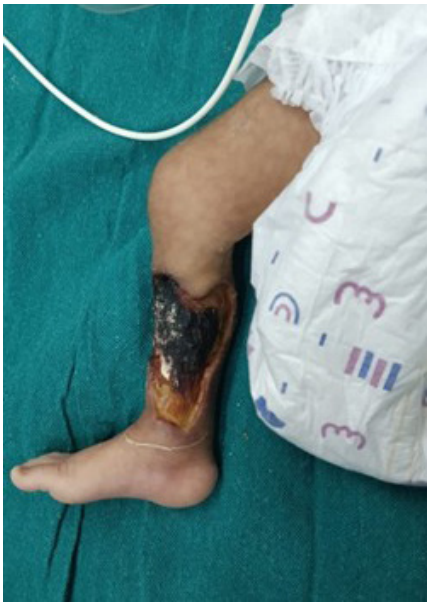

Figure 1: An image at day one of life during presentation showing extent of involvement

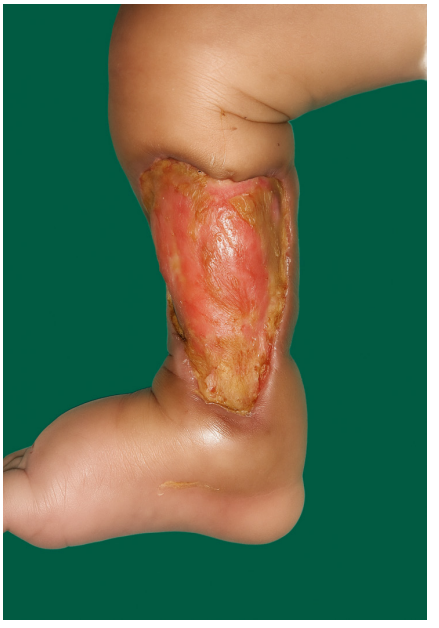

Figure 2: An image showing improvement at two weeks of treatment

DISCUSSION

Extravasation injuries in preterm neonates represent a significant clinical challenge due to their fragile skin, immature vasculature, and limited subcutaneous tissue, which increase vulnerability to severe tissue damage. Calcium gluconate extravasation is a recognized but uncommon cause of soft tissue injury, with potential to cause local necrosis, calcinosis cutis, and secondary complications such as infection and septic shock, as observed in this case.[2,3]

The incidence of extravasation injuries in NICU is reported to be as high as 70%, with preterm infants disproportionately affected due to their anatomical and physiological vulnerabilities.[3,4] Calcium gluconate, a vesicant agent, can cause tissue injury by precipitating calcium salts in the interstitial space, leading to inflammation, ischemia, and necrosis. Our case demonstrates extensive necrosis from the dorsum of the ankle to the knee, a severe manifestation rarely documented in the literature, especially complicated by septic shock.[3]

Management of neonatal extravasation injuries varies widely, lacking consensus. Conservative treatment with regular wound care, is generally not the treatment of choice in vesicant infusion injuries manifesting necrosis but was employed in this case still leading to satisfactory healing, when recognized and initiated promptly.[5] Recent studies emphasize the importance of early identification and cessation of the offending infusion, elevation of the affected limb, and appropriate wound dressing to prevent infection and promote healing.[6] Surgical intervention is generally reserved for extensive necrosis or failure of conservative management.

Septic shock as a complication of extravasation injury is infrequently reported but represents a severe manifestation requiring intensive care support, including fluid resuscitation, inotropes, and respiratory support, as seen in this patient.[3] This highlights the need for vigilant monitoring and aggressive management of systemic signs in neonates with extravasation injuries.

Preventive strategies include vigilant intravenous catheter placement, transparent dressing, frequent site inspection, use of central lines when appropriate, and staff education on early signs of extravasation.[4] Given the high morbidity associated with such injuries, especially in preterm infants, this case highlights the critical importance of prevention, early recognition, and multidisciplinary approach.

In conclusion, this case adds to the existing evidence on severe calcium gluconate extravasation injuries in preterm neonates. It illustrates the potential for extensive tissue necrosis and life-threatening complications such as septic shock, while also demonstrating that conservative wound management can lead to favorable outcomes. Further research is needed to establish standardized treatment protocols and preventive measures tailored to this vulnerable population.

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CONFLICT OF INTEREST: None

CONSENT: Informed consent has to be taken for case report if you are using any photographs of individuals face and it has to be submitted to the journal.

REFERENCES:

1. Ogunlesi TA, Lesi FE. Prophylactic intravenous calcium therapy for exchange blood transfusion in the newborn. In: The Cochrane Collaboration, editor. Cochrane Database of Systematic Reviews [Internet]. Chichester, UK: John Wiley & Sons, Ltd; 2014 [cited 2025 Jul 4]. p. CD011048. **https://doi.org/10.1002/14651858.CD011048**
2. Pacheco Compaña FJ, MidónMíguez J, De Toro Santos FJ. Lesions Associated With Calcium Gluconate Extravasation: Presentation of 5 Clinical Cases and Analysis of Cases Published. Annals of Plastic Surgery. 2017 Nov;79(5):444-9. **https://doi.org/10.1097/SAP.0000000000001110**
3. Othman S, Ali R. Neonatal extravasation injuries: neonatal unit reflection and literature review. Sudan J Paed. 2022;166-71.**https://doi.org/10.24911/SJP.106-1629143747**
4. Leo AD, Leung BC, Giele H, Cogswell L. Management of Extravasation Injuries in Preterm Infants. SS. 2016;07(09):427-32. **https://doi.org/10.4236/ss.2016.79058**
5. Sagheb S, Mohseni SO, Lamsehchi A. A new approach to skin extravasation injury management during the neonatal period.BMC Pediatr. 2022 Dec;22(1):451. **https://doi.org/10.1186/s12887-022-03511-y**
6. Yew CK, Johar SF, Lim WY. Case series of neonatal extravasation injury: Importance of early identification and management. Cureus. 2022 Jan 12;14(1). **https://doi.org/10.7759/cureus.21179**