

# Successful treatment of extravasation injury with topical heparinoid in a pediatric patient

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## Dear Editor,

Extravasation is unintentional drug administration or leakage to perivascular space, subcutaneous tissues during intravenous drug administration. It is one of the common complications, which is seen in many patients admitted to pediatric intensive care unit for long-term, and received multiple drug support. Pain, erythema and swelling can be observed when vesicant agents leak to extra-vascular space. Irritant agents can cause burning sensation and pain when extravasation occurs or by leading irritation at vessel wall before or at onset of extravasation. It may lead inflammation which can progress to phlebitis without necrosis (1-6). Here, we presented extravasation from total parenteral nutrition solution in an infant with mitochondrial disorder with poor general status who had been followed in pediatric intensive care unit. We achieved recovery without sequel in this patient by local heparinoid treatment.

A 4-months old hypotonic girl had been followed in pediatric intensive care unit with diagnoses of mitochondrial disorder. The patient with poor general status was unconscious, intubated, and mechanically ventilated. Enteral feeding was withdrawn due to abdominal distension, and deterioration in general status. It was predicted that enteral feeding couldn't be given over more than one week; thus, total parenteral nutrition support was prescribed.

Catheter at central venous line was removed due to growth in culture. In blood culture and peripheral culture analyse, there was not a microorganism grown. The hypotensive patient was considered as septic shock. Positive inotropic support was initiated in the patient. Peripheral intravenous lines were established. In addition inotropic support, antibiotic therapy and total parenteral nutrition were provided via peripheral

access. Total parenteral nutrition solution was infused from peripheral intravenous access in lateral marginal vein at dorsum of left foot. It was recognized that there was edema and erythema at infusion site on the hour 3. Infusion was stopped. by using a sterile syringe, total parenteral nutrition solution leaked was aspirated. Elevation and local cooling was applied to extravasation site. No antidote was given, as there is no specific antidote.

Then, hyperemia developed at extravasation site on the hour 5 and extravasation site was observed as ecchymotic tissue on the hour 24 (Figure 1a); followed by necrosis. Since patient with poor general status was receiving inotropic support, intravenous coagulation couldn't be given due to risk for bleeding. Topical heparinoid (Hirudoid Forte®Gel) was applied to lesion site twice daily over 30 days in a closed manner. Necrotic tissues were removed as thin layers. It was awaited to dry over 3 minutes and heparinoid was then applied as a thin layer over necrotic area topically. During follow-up, progressive regression was observed in necrosis (Figure 1b). Recovery with minimal scar tissue and no sequel was achieved on the day 30 (Figure 1c).



**Figure 1.** Ecchymotic area developed after extravasation (a), 15<sup>th</sup> day of local therapy (b), recovery without sequel was achieved on the 30<sup>th</sup> day (c).

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Extravasation is defined as leakage or accumulation of fluids given intravenously from intravascular area to interstitial space. Treatment options differ according to agents causing extravasation (2). Parenteral nutrition solutions are classified as vesicant agents. Lesions ranging from mild hyperemia to those accompanied by edema and necrosis can develop. In our case, a lesion site which evolved from local hyperemia to edema, warmth and tissue necrosis was observed (3,7).

The goal of treatment is to prevent tissue necrosis and progression of ulceration. Infusion should be stopped immediately while removing catheter completely when extravasation is suspected (if tenderness and pain are present). Extremity should be elevated. During acute phase (first 48-72 hours), cold compression (over 20 minutes) should be applied to the area for 3 or 4 times per day. In recent years, several studies were conducted on topical use of parenteral agents at injury site; in addition, some case reports are also present in the literature. Ozcan et al. (5) applied elevation, local antibiotic ointment and pentoxifylline to improve circulation at tissue level in a case with acute adrenalin extravasation. In rat experiments, significant difference was detected by heparinoid use in topical insults when compared to placebo (8, 9).

Local heparinoid therapy was applied in our case with poor general status and bleeding diathesis because intravenous anticoagulant therapy was contraindicated. Heparinoid has anticoagulant, fibrinolytic, anti-inflammatory, anti-edematous effects and it accelerates regeneration of connective tissue. Along with general approaches, drug-specific topical treatment approaches can be tolerated readily and likelihood of adverse events is low (9). We applied heparinoid therapy, which is generally used via

intravenous route, to necrotic extravasation site over 20 days, achieving recovery without sequel. Heparinoid should be kept in mind and should be preferentially included to treatment plan with its local effect and satisfactory results in infants with extravasation injury.

**Conflict of interest**

*No potential conflict of interest relevant to this article was reported.*

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