

CASE REPORT

Necrotizing Fasciitis in Neonate and Use of Allograft

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How to cite: Borkar NB, Padhi P, Mishra JK, Sahu SA, Mohanty D, Singh S. Necrotizing fasciitis in neonate and use of allograft. J Neonatal Surg. 2019;8:8.

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ABSTRACT

Necrotising fasciitis is a fulminant and rapidly progressive infection of the superficial fascia and subcutaneous tissue. It is rare in newborn. Trunk is the commonest site of involvement in newborns. Early diagnosis and prompt surgical debridement is the preferred treatment. Debridement in NF leads to a large raw area which may not heal by primary intention and may a split thickness skin graft for healing. Presence of minimum subcutaneous fat, loose skin and large raw area at donor site like back in some neonate poses difficulty for harvesting of skin graft. In such neonates allograft make a valuable option temporarily. Herein we report a case of a neonate with NF in whom post debridement raw area was covered with allograft from mother.

Key words: Necrotising fasciitis; Neonate; Allograft

INTRODUCTION

Necrotizing fasciitis (NF) is a rapidly progressive and potentially fatal infection of the fascial planes, leading to necrosis of the superficial fascia, subcutaneous cellular tissue, and skin [1]. It is rare in children with an estimated prevalence of 1.12/10,000 discharges [2]. It is considered as a disease of diabetic or immunocompromised adults; however, most children who develop NF are healthy [3]. Minor injuries and sometimes surgical trauma are considered as an inciting factor, and in many incidences, the initiating factor may not be identified at all. Early diagnosis and prompt surgical debridement is the preferred treatment. Large raw area following debridement may not heal by primary intention and needs a split-thickness skin graft for healing. The presence of minimum subcutaneous fat and loose skin in some neonate poses difficulty for harvesting of skin graft. In such neonates, allograft makes a valuable option. Herein, we report a case of a neonate with NF in whom post-debridement raw area was covered with allograft from the mother.

CASE REPORT

A 13-day-old male child, weighing 3 kg, presented with an extensive reddened and tender area over the

left lower back for 1 week. On admission, the baby was febrile, irritable and had tachypnea. The baby was born at term by normal vaginal delivery. On clinical examination, there was an extensive erythematous, edematous, and violaceous colored tender area over the left lower back extending to buttock (Figure 1). The laboratory findings showed leukopenia, thrombocytopenia with raised CRP and ESR. The patient was managed with intravenous Cloxacillin followed by debridement and excision of the necrotic subcutaneous tissue and skin resulting in a large raw area (Figure 2). Wound culture yielded oxacillin-resistant *Staphylococcus aureus*, which prompted change of antibiotic to intravenous clindamycin. Regular dressings were done after debridement. In view of the large raw area that predisposed to loss to proteinaceous exudates and non-availability of suitable donor area from where a skin graft could have been taken from in the baby himself, it was decided to provide temporary cover with mother's skin allograft. On day 29, after investigations and with due consent, allograft was harvested from mother's thigh and applied over baby's raw area. Grafted skin was fixed with cyanoacrylate glue. By the 10th post-operative day of grafting, most of the grafted skin was rejected, but it had initiated the process of wound healing from the periphery of the wound. Complete healing

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Submitted: 19-12-2018

Conflict of interest: None

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Accepted: 26-12-2018

Source of Support: Nil



Figure 1: Erythematous, edematous, violaceous colored area over the left lower back extending to buttock



Figure 2: Large raw area few days after debridement



Figure 3: Healed raw area 1 month after applying allograft

of the recipient area was achieved within a month of grafting (Figure 3).

DISCUSSION

The term NF is a potentially fatal and progressive soft tissue infection. It can be either primary (or idiopathic) where no causative agent is identified or secondary where a predisposing factor is present. Insignificant trauma during the routine baby care, leading to breach in the baby's delicate skin and allowing invasion of virulent organisms, is a possible mechanism for the development of NF in neonates [3]. In neonates, few cases have been reported after omphalitis, circumcision, umbilical catheter insertion, and after necrotizing enterocolitis [4-6]. Immature immune system of newborn's also predisposes for the development of NF. NF in neonates is either polymicrobial or monomicrobial with *Staphylococcus aureus*, the most common causative organism in both the types [2,7]. In our reported case, it was methicillin-resistant *Staphylococcus aureus* which had contributed to the development of necrotizing fasciitis. Other microorganisms associated with NF are Gram-negative bacteria such as *E. coli*, *Klebsiella*, *Citrobacter*, and *Pseudomonas* and fungi such as *Aspergillus* and *Candida albicans*. Infection with polymicrobial agents is more frequently encountered than monomicrobial type. Common site of involvement for NF in neonates is trunk and neck unlike adults where extremities and perineum are the frequently involved sites [8]. In our reported case also, NF affected the patient's lower back.

Early clinical manifestation of NF is induration which is followed by erythema or purple discoloration. Later that area becomes black and sometimes hemorrhagic blisters develop in the involved area. Early diagnosis of the condition and prompt initiation of supportive treatment such as antibiotics and radical surgical debridement offers the best chance for survival. The presence of dusky gray subcutaneous fat and fascia with scanty serosanguineous discharge helps in defining necrotizing fasciitis during debridement. Radical surgical debridement invariably results in a large wound as in our case. These large wounds may not heal by primary intention. Early coverage of such large wounds prevents wound infection, restores function, provides coverage to nerves and vessels, reduces protein loss from wound, and also helps to maintain a positive nitrogen balance. The limited donor area in neonates and loss of subcutaneous tissue often makes harvesting of skin graft difficult. The graft is commonly obtained from donor sites such as thigh or back. Lower back was already involved in our patient and fear of soiling of donor thigh area with urine and stool made us to search for alternative options. Skin graft also needs to be harvested under general anesthesia, and sometimes, it is unsafe to administer anesthesia to these already sick neonates. In such situation, allograft from live donor is a useful alternative to homografts. Allograft is a known and described method of the treatment for burns in adults. Autograft overgrafted with allograft has been used in the treatment of neonatal burn injuries [9]. Although described, allograft has

not been utilized for the treatment of necrotizing fasciitis in children and neonates. Skin from a live donor does not require much preparation or preservation as it can be used immediately after harvesting. Applying allograft did not require anesthesia in our case as the graft was fixed with cyanoacrylate glue at the wound edges. Allografts are biologic dressings which are supposed to be ultimately rejected by the patient's immune system. In our patient also, allograft was harvested from mother and immediately applied to the baby. Although most of the graft was rejected, possibly the accepted islands of allograft acted as a nidus for the development of neo-epithelium and initiated the process of healing. After 30 days past grafting, the wound healed completely with improvement in general condition of the patient.

To conclude, allograft from live donor is a good alternative as a biological dressing for large raw areas in neonates, especially in sick neonate and in whom harvesting donor area is not available.

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