

Picture story

Cosmetic wound care in an extremely preterm neonate

*W A K Wanasinghe¹, Y H S T Yapa¹, W M C L Weerasinghe¹, I M Kumarasiri¹, D Dissanayake², Medha Weerasekara³

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Background

Preterm neonates have thin, fragile skin, prone to damage through friction, shear, stripping or pressure¹. While birth weight and gestational age are non-variable risk factors for unintended skin injuries, prolonged use of medical devices, types of adhesives and saturation probes used in the Neonatal Intensive Care Unit (NICU) are modifiable risk factors¹. Though wound management is addressed well in the literature and guidelines, less data are provided on management of skin injury and resulting scars in neonates. We report a case of successful wound and scar management of an extremely preterm newborn.

Case report

An extremely preterm baby, born at 24 weeks of gestation, with a weight of 600g was transferred to our unit at day 1 of age. Baby had received extensive bilateral facial contusions during delivery. Adhesive plasters used to secure endotracheal tube resulted in further injury with full thickness skin being stripped off despite delicate attempts at removal. Result was bilateral deep gaping wounds on face, extending beyond subcutaneous fat in certain places. Initially, the wounds were managed with local application of fucidic acid and intravenous antibiotics. Considering the future impact on the facial appearance, plastic surgical opinion was obtained. The wounds developed slough and necrotic areas with poor healing. The plastic surgical team debrided the wound and applied *collagen sheets* (Figure 1).

With successful healing of wounds over several days, collagen sheets spontaneously came off revealing disfiguring scars (Figure 2).

With expert cosmetic surgical advice, scars were managed by application of *silicone gel sheets* over the scarred areas. Duration of silicone gel application was initially over 4 hours per day which was increased to 12 hours a day (Figure 3).

Over several weeks scars faded away with an impressive appearance at 3 months of age (Figure 4).

Discussion

Neonatal skin is more vulnerable to injury due to fewer layers in the stratum corneum, less number of fibrils connecting dermis to epidermis, wide connecting points and increased permeability^{1,2}. The susceptibility of skin to injury increases inversely with the gestational age, making the preterm skin even more vulnerable³. However, the damaged skin repairs quickly owing to accelerated production of granulation tissue and the extracellular matrix^{3,4}. Formation of the scar tissue is determined by the depth of the injury. Depending on the site of the wound there can be disfiguration and contracture formation, raising the future possibility of cosmetic concerns⁵. Among iatrogenic skin injuries encountered in the NICU, Medical Adhesive Related Skin Injuries (MARSI) are a common occurrence¹. The mechanism of the injury is explained by the weak connection between the dermis and epidermis causing separation of the two with the removal of the adhesive^{1,2}. MARSI comprises mechanical injuries including epidermal stripping, tension injury, blistering and skin tearing². Other types include dermatitis reactions and skin macerations due to trapping of the moisture².

The management of neonatal skin injuries must be catered for, overlooking the conventional methods used in paediatric and adult patients. Holistic wound care comprises a simultaneous approach in removing or controlling the causative factors and healing the wound³. Special attention must be given to general care in optimizing the host factors, including tissue perfusion, oxygenation and nutritional status³. The ideal dressing selected is decided by the colour of the wound bed, the depth of the wound, and the volume of exudate³.

¹Registrar in Paediatrics, Sri Jayewardenepura General Hospital, Sri Lanka, ²Consultant Plastic and Reconstructive Surgeon, National Hospital, Sri Lanka, ³Consultant Neonatologist, Sri Jayewardenepura General Hospital, Sri Lanka.

*Correspondence: achalawanasinghe89@gmail.com



<https://orcid.org/0000-0001-6336-1362>

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Initially we used the *Collagen dressing* in our patient, considering the area and nature of the skin injury. Common wound dressing methods include hydrocolloids, hydrogels, foams, barrier cream and barrier films. However, in cases where the wounds are large or healing is slow, collagen dressings can be used. They are acellular tissue dressings produced from purified bovine connective tissues which supplement and stimulate the collagen of the newborn skin⁴. Later, *Silicon gel sheets* were applied to minimize residual scar tissue. The likely mechanism is occlusion and hydration of the stratum corneum with subsequent cytokine mediated signalling from keratinocytes to dermal fibroblasts which will help normalize excessive scars⁵. Better outcome is expected when silicon gel is used early in the healing process. Adverse effects are mainly localized reactions⁵. Scar revision can be done in future, if deemed necessary. Facial asymmetry, later in life, can be managed with autologous fat transfer, laser resurfacing or injection of platelet-rich plasma⁶. Thus, continued follow up is important.

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Figure 1: Day 6 – collagen dressing
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Figure 2: Day 14 – healed wound with early scar tissue
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Figure 3: Silicone gel applied over scars
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Figure 4: Three months – healed scars
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