

Successful Reconstructive Surgery for Facial Deformity Caused by *Paederus fuscipes*: An Illustrative Case Report

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KEYWORDS

Blister, aesthetics, facial injuries, skin transplantation

ABSTRACT

Full thickness skin graft is a simple and reliable method for closure of small facial wound defect. A thorough understanding of how a skin graft heals and how to perform the procedure is essential for successful outcome. We report the use of full thickness skin graft in a wound closure of a facial skin defect caused by *Paederus fuscipes*, locally known as *charlie*. An 8-year old boy developed blister and painful swelling over his right cheek following skin contact with *charlie*. This lesion gradually became extensive, eventually leading to tissue loss and facial wound defect. A full thickness skin grafting was performed with satisfactory functional and excellent aesthetic result.

INTRODUCTION

Paederus fuscipes or *charlie* neither bite nor sting, but accidental contact with the human skin may result in the release of coelemic fluid containing *paederin*, a potent vesicant agent, causing an inflammatory reaction known as paederus dermatitis [1,2] with burn-like erythema and blistering.

The synthesis of *paederin* relies on the activities of an endosymbiont bacterium, *Pseudomonas species* within the beetle. *Karthikeyan & Kumar* (2017) found that *paederin* causes a wide spectrum of histopathological changes, such as epidermal

necrosis and blistering during the early phase of contact and acanthosis with mitotic figure in the later phase [2]. The scattered cells found in the areas of older lesions may show evidence of DNA fragmentation hence, giving the visible appearance of local inflammation due to the toxic injury to the upper epidermis and apoptosis in the lower epidermis [2,3].

The erythematobullous lesion resulting from direct contact with *charlie* usually resolves spontaneously unless it becomes secondarily infected or is complicated with soft tissue loss. This case report outlines the rare complication caused by the external contact with *charlie*, and describes its management by a full thickness skin graft as the reconstructive ladder in the closure of the facial wound defect.

CASE HISTORY

An 8 years old boy, a known case of β -Thalassemia major, was referred to the paediatric dental team for blister and painful swelling over the right cheek with progressive periorbital oedema for three days.

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Further history noted that the child had had skin contact with *charlie* prior to the onset of symptoms.

On examination, patient was febrile with the temperature of 38°C. He was lethargic and unwell. Maxillofacial examination revealed a burn-like lesion over the right cheek (Fig 1).



Figure 1: Right facial swelling with superficial tissue ulceration and periorbital oedema at presentation.

There was central superficial tissue ulceration with serous and pus discharge. The area was warm and tender to palpation. He also had periorbital oedema and was unable to open his right eye. Intraorally, patient had limited mouth opening, poor oral hygiene with multiple caries and retained roots of deciduous teeth. Orthopantomogram revealed an early mixed dentition with the presence of developing permanent tooth germs. There was no sign of infection from the dental origin. Hence, the diagnoses of right facial cellulitis with secondary non-odontogenic infection with right infraorbital abscess were made.

Incisional and drainage (I&D) of the right infraorbital abscess and comprehensive dental treatment were performed under emergency general anaesthesia. Pus culture and sensitivity was positive for *Enterobacter aerogenes* sensitive to Metronidazole. The patient subsequently completed intravenous Cloxacillin and Metronidazole for 5 days. On Day 4 post-emergency incision and drainage, the lesion became necrotic with pus discharge (Fig 2) requiring wound debridement.

His antibiotic was escalated to high dose intravenous Amoxicillin/Clavulanic acid as guided by culture and sensitivity testing, completed for 14 days. Adequate analgesia was prescribed. Progressive recovery was subsequently observed. The initial area of wound defect revealed a clean healthy granulation tissue without local infection (Fig 3).



Figure 2: Secondary infection with right infraorbital abscess at Day 4 post-incision and drainage.

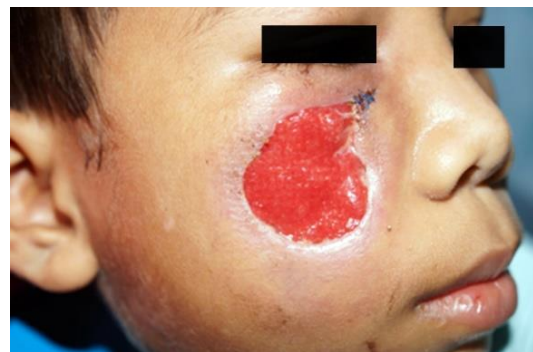


Figure 3: Healthy granulation tissue area ready for skin grafting.

Full thickness skin graft was considered for the closure of wound defect in view of aesthetic concerns to match the overall appearance and texture. The medial aspect of the right arm was chosen as the donor site.

Grafting procedure involved using a tracing paper that was placed onto the wound to develop a blotter pattern and was marked. The cut-out pattern was then applied over the donor site, traced with a marking pen. A graft of the outlined area was subsequently resected (Fig 4).



Figure 4: Full thickness skin graft harvested from the medial aspect of right arm (intraoperative).

Full thickness skin graft was positioned over the recipient wound defect with the dermis side down

and sutured circumferentially with a non-absorbable suture. A few sutures were then left with long tails for anchoring. The donor site was closed primarily, covered with antibiotic ointment and dry gauze. The sutures were removed after 10 days.

Figure 5 showed the recipient site dressed with a piece of gauze soaked in diluted iodine with the suture ends tied to secure the dressing.



Figure 5: A tie over dressing using diluted iodine gauze (intraoperative).

This was done to fixate the graft and ensure a good contact between the graft and the wound bed. The iodine dressing was kept for ten days before it was removed. Following after, daily inspection and local dressing with normal saline and application of chloramphenicol antibiotic ointment was performed.

Sutures from the recipient site were removed alternately by day 12 post-operatively and were completely removed by day 18 post-operatively. The patient was regularly reviewed to monitor for signs of recipient site dehiscence or graft failure. A series of outpatient reviews revealed a satisfactorily functional and excellent aesthetic result of skin grafting in view of no obvious skin contracture or hypertrophic scarring (Fig 6).



Figure 6: Post-operative at 6 months.

DISCUSSION

Paederus fuscipes or *charlie* belongs to the insect order of Coleoptera (beetles) and the family of Staphylinidae (rove beetles). A study conducted in Malaysia found that *Paederus fuscipes* is an aggressive leafhopper predator in the rice fields [4]. In this case, the child's home was nearby a paddy field, which increases the probability of contact with the insect. *Paederus dermatitis* is a peculiar, irritant contact dermatitis characterised by a sudden onset of erythematobullous lesions on the exposed areas of the body [5]. This causes local erythema, edema, vesicular papules, painful blister, burning sensation, pruritis, hyperpigmentation and skin peeling such as observed in this case presentation.

The common sites of involvement are the face, neck, shoulders and arms [6]. The discomfort is commonly self-limiting unless the area becomes secondarily infected. In severe cases, apart from an extensive blistering, patient may demonstrate additional symptoms of fever, neuralgia, and arthralgia [7,8]. Our patient has developed a secondary infection over his right cheek resulting in infraorbital abscess requiring incision and drainage.

In this case, the lesion was extensive and resulted in wound defect over his right cheek. Furthermore, primary closure was impossible due to the soft tissue loss, and closure by secondary intention may be complicated by scarring and skin contracture. Therefore, full thickness skin graft was considered as the next rung on the reconstructive ladder of the facial wound defect closure.

Full thickness skin graft consists of the entire epidermis and dermis. Skin graft is harvested from the donor site and transferred to a distant recipient site with a precise dimension to fit the wound. The graft heals by receiving blood supply from the wound bed and new blood vessels continually proliferate to allow the viability of new skin. Full thickness skin grafts are generally used to overlay smaller defects, such as over the face, including the nose, eyelid, ear and finger [9].

There are several factors that were taken into consideration when choosing a donor area including the appearance, colour, texture, thickness, hair growth and the vascularity of the overlying skin [9]. In the case presented, the medial aspect of the right arm was chosen as the donor site to produce good result in terms of texture match.

Our patient required repeated wound debridement prior to the application of the graft to ensure the

wound bed is healthy and ready to receive the transplanted graft. It is imperative that measures are taken to give the best chance of survival of the transplanted graft later on. Some studies also suggest the application of antiseptic such as chlorhexidine and removal of slough from the wound bed [9].

In view of the subjective mobility of the native cheek tissue, shear forces may separate the graft from the bed and prevent the contact necessary for capillary link up and subsequent survival. Hence, the shear force is minimised by using a foam tie dressing or proflavin gauze to ensure good contact between the graft and the recipient bed. In our case, the sutures were only removed after 10 days, while other studies suggested that the graft stabilisation with a bolster is deemed adequate between five to seven days until the initial fibrin adhesion has been converted into a strong fibrous tissue anchorage [10].

Our case demonstrates excellent aesthetic results from full thickness skin grafting for a rare

complication of paederin dermatitis. Therefore, medical community should be vigilant of the ubiquity of *charlie* contact in the tropical region and its clinical presentation as well as to anticipate the rare complications.

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DECLARATION OF INTEREST

None declared.

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