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Research Article

Ecthyma Gangrenosum on the Scalp of a New Born Child: A Report of its Successful Management

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ABSTRACT
Ecthyma gangrenosum is a very serious cutaneous infection that has a poor prognosis when it occurs in children, especially among neonates. It is usually caused by *Pseudomonas aeruginosa*, but can follow infection with other microorganisms. The skin lesion is a result of bacteremia leading to disseminated infective vasculitis. We report a 3-week-old neonate with ecthyma gangrenosum on the scalp caused by *Pseudomonas aeruginosa* who was successfully managed.

Keywords: Ecthyma gangrenosum; Kano; Neonate; Nigeria; *Pseudomonas aeruginosa*

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INTRODUCTION

Ecthyma gangrenosum (EG) is a skin infection associated with septicemia due to *Pseudomonas aeruginosa* in most cases but can be associated with other gram-positive and gram-negative cocci and sometimes may be due to fungal infections or as a result of primary EG in the absence of bacteremia among immunocompetent individuals due to localized infections. Theros *et al*, 2025. It is caused by thrombotic vascular lesions due to peri-vascular bacterial invasion in the dermis as well as subcutaneous tissues which causes necrotizing vasculitis. Theros *et al*, 2025.

Ecthyma gangrenosum was first described by a Canadian pathologist Dr. Lewellys Baker in 1897 (O' Sullivian *et al.*, 2017). It presents with a characteristic lesion of a haemorrhagic pustule that evolve into necrotic punched-out gangrenous ulcers with black-gray eschar (Patel *et al.*, 2009) Early diagnosis of EG permits early treatment and therefore reduces high mortality associated with sepsis due to pseudomonas aeruginosa. (Theros *et al.*, 2025).

EPIDEMIOLOGY

The incidence of EG in patients with *P. aeruginosa* bacteraemia is between 1-3% (Rhody, 2000). *Pseudomonas aeruginosa* leads to up to 5.7% of nosocomial sepsis cases in premature newborns, but few cases among them evolve into EG. (Rhody *et al.*, 2000) Ecthyma gangrenosum affect all age groups and genders (Rhody *et al.,* 2000).

In general population EG is mostly located in anogenital region, extremities and on the trunk, but rarely on the head or neck (Funk *et al.*, 2009) However, most of the cases of EG in neonates from literature involve the head and neck region. (Atiyeh *et al.*, 1998). This formed the basis of the term nomaneonatorum because of its clinical similarity with Noma also called cancrum oris (Atiye *et al.*, 1998) a disease caused predominantly by *Fusobacterium necrophorum* and *Prevotella intermedia* (Enwonwu *et al.*, 2000) which occurs mostly in children from 2years old, as well as adults (Atiyeh *et al.*, 2009). Freeman *et al.* (2002) later added nomaneonatorum in the description of EG because of their common aetiologic agent. *P. aeruginosa* which is inexistent in classical noma.

Differential Diagnosis

The most common differential diagnosis of Ecthyma gangrenosum among neonates is Noma neonatorum which is also caused by *Pseudomonas* (Freeman *et al.*, 2002).

Diagnosis of EG is mainly clinical (Huminer *et al.*, 1987). However, cultures must be used to confirm the diagnosis and differentiate it from its other differentials such as deep mycosis or lesions caused by anaerobic pathogens. The goal of treatment is to resolve the bacteraemia if present, which affects the prognosis and involves the use of broad-spectrum antibiotics generally consisting of aminoglycoside and antipseudomonal $_{\beta}$ lactam, use of topical antibiotics and mechanical or chemical debridement (Huminer *et al.*, 1987; Wolf *et al.*, 1989; Song *et al.*, 2001).

CASE REPORT

A 3 week old neonate reported to Murtala Muhammad Specialist hospital Kano, Nigeria, dermatology clinic with history of fever and a rapidly increasing lesion on the occipital region of the scalp. The lesion was said to have started as a small pustule which progressed to form an ulcer. There was associated fever, catarrh and refusal to suck. The baby was delivered at home via spontaneous vaginal delivery, weighing 2.5kg at presentation. A product of term gestation. Pregnancy was unbooked but uneventful. There was no history of underlying immunodeficiency.

On examination the baby was acutely ill-looking, febrile with core temperature of 400c, in respiratory distress (respiratory rate of 70/min). The heart rate was 170/min. There was multiple solitary, mobile, cervical lymph nodes.

The lesion on the scalp measured 3.3 x 4cm, and necrotic. Figures1, 2 and 3 show the pictures of the child on presentation at the clinic, during treatment and after treatment.

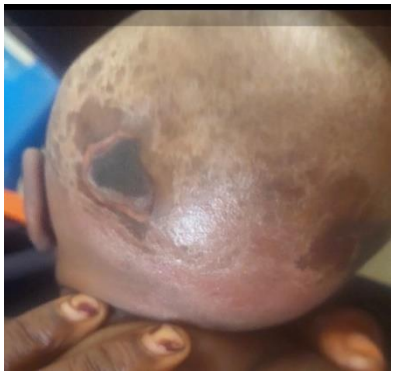

Fig 1: Child at presentation

Fig 2: During treatment

Fig 3: After treatment

Diagnosis of ecthyma gangrenosum and sepsis was made based on the history and the clinical findings. Random blood sugar was 4.5mmol/l. The baby was placed on intravenous ciprofloxacin (10mgs/kg/day for 3 weeks, gentamicin 5mgs/kg/day for 3 weeks, metronidazole 0.75mg/kg/ dose 8hly for 3 weeks) and wound debridement was done, daily ulcer dressing with eusol and application of topical gentamicin cream.

Septic screening revealed white blood cell count of 22.2mg/dl (75% polymorphs) haemoglobin of 15g/dl, platelet count of 110,000µl. Blood culture and swab culture from the lesion revealed *Pseudomonas* species. Screening for HIV was non-reactive. Intravenous antibiotics were continued for 3 weeks and wound dressing for 8 weeks after which the lesion healed with a scar.

DISCUSSION

Ecthyma gangrenosum presents with one or more greyish black eschars surrounded by erythema and necrosis (Huminer *et al.*, 1987). The common sites of EG occurrence are gluteal region, extremities, trunk and face. (Patel *et al.*, 2009). However, the patient in this report presented with a lesion on the scalp which is an uncommon site of occurrence.

Vindhiya *et al* reported a 28-day old neonate with ecthyma gangrenosum and scalp involvement similar to that of the patient in this report. (Vindhiya *et al*,2017)

The lesion in EG occur as a result of disseminated infective vasculitis and may appear as macule, papules or nodules (Patel *et al.,* 2009) this reported case the lesion initially started as papules. The lesion can have a central haemorrhagic vesicle or bulla which leaves a punched-out indurated ulcer that has elevated oedematous edges and central necrosis when raptured. An erythematous halo usually surrounds the ulcer (Dorff *et al.*, 1971).

Ecthyma gangrenosum is usually caused by *Pseudomonas aeruginosa* (Vindhiya *et al.*, 2017). The wound swab and blood culture in this reported patient showed Pseudomonas specie. It can also be caused by different forms of bacteria, fungus, and viruses (Patel *et al.,* 2009). Ashish *et al* reported Ecthyma gangrenosum in a neonate caused by Escherichia coli. (Ashish *et al.,* 2013)

Ecthyma gangrenosum is common in immunocompromised patients especially those with neutropenia and critically ill patients but it can occur in healthy people (Foca *et al.*, 2013; Huminer *et al.,* 2013; Patel *et al.*, 2009) in this reported case no evidence of immunodeficiency. Transient risk factors like concurrent viral infection and recent antibiotic therapy have been proposed as those factors may disrupt normal host defenses by weakening the mucosal barrier of the gastrointestinal tract or temporarily affecting neutrophil number and function (Pechter et al,2012). However, the patient in this report had concurrent upper respiratory tract infection.

Early diagnosis and prompt treatment of EG is necessary to avoid the high mortality associated with it. The mortality is high (up to 77%) even with appropriate treatment especially among immunocompromised individuals. Death usually follows septic shock and multisystem organ failure. Reported mortality for the non- septicaemic variant is better (about 15%) (Pena *et al.*, 2011).

CONCLUSION

Ecthyma gangrenosum should be considered in all patients with sepsis and new skin lesion as its presentation is variable (Theros et al,2025) especially among immunocompromised patients. Early diagnosis and prompt initiation of treatment is essential to prevent rapid progression of the lesions and high mortality associated with it.

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