Neonatal compartment syndrome

Sirisha Andey,¹ Kiran Sasi,² Binu P Thomas,² Mintoo Tergestina ¹

¹Department of Neonatology, Christian Medical College and Hospital Vellore, Vellore, Tamil Nadu, India

²Department of Hand and Leprosy Reconstructive Surgery, Christian Medical College and Hospital Vellore, Vellore, Tamil Nadu, India

Correspondence to
Dr Mintoo Tergestina;
tergestina@gmail.com

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DESCRIPTION

A term large-for-gestational-age neonate was born via an uncomplicated normal vaginal delivery at a peripheral hospital. The neonate was referred to our tertiary centre due to concerns regarding the appearance of the right hand. On examination at 6 hours of life there was cyanotic discoloration of the right hand with delayed capillary refill and absent radial, ulnar and brachial pulses. The hand was swollen, cold to touch and sluggish fresh bleeding was noted with pinprick. Additionally, there was an area of approximately 8 × 10 cm of necrotic skin on the medial aspect of the forearm (figures 1 and 2). There appeared to be constriction bands on the right wrist and right elbow. There were no other areas of concern on examination, and the neonate was active and moving all other limbs.

Neonatal compartment syndrome was suspected due to the ischaemic right hand and likely sentinel forearm lesion. The neonate was taken for an emergency fasciotomy.

Postfasciotomy, the fingers of the right hand and muscles appeared pink and well perfused. However, postoperatively, the fingers of the right hand progressively became gangrenous and the forearm demonstrated new areas of gangrene. The baby's parents were counselled regarding the need for further evaluation and operative intervention, including the possibility of amputation of right forearm, functional impairment and need for long-term follow-up.

They did not provide consent, and the baby was discharged against medical advice and then lost to follow-up.

Neonatal compartment syndrome is a rare entity, with 60 patients in 26 studies reported so far.¹ Multiple aetiologies that have been hypothesised

Figure 2 Lesion on the extensor aspect, with surrounding blisters.

for the same, including compound presentation, oligohydramnios, amniotic band syndrome and thromboembolic events^{2–5} and an association with thrombophilia and perinatal ischaemic stroke.^{6–8} The sequelae–Volkmann's syndrome, or Volkmann's ischaemic contracture, is well described in literature, with neuropathy, muscle loss and bone growth abnormalities leading to contractures and impaired function.⁹

The diagnosis of compartment syndrome in a neonate is clinical and requires urgent operative intervention. The cardinal feature is the sentinel lesion, seen in all patients described in literature, emphasising the importance of this clinical sign in diagnosis. The appearance at presentation varies based on age of the lesion, from skin discoloration to bullae, necrosis and gangrene.^{1 10} The ischaemic changes in the skin, while commonly mistaken for birth trauma, herald damage to the underlying deep tissues.

Compartment pressures are not routinely measured in the neonate because no standards are available for pressure gradients in newborns, and in most cases, the diagnosis is based on clinical findings without the measurement of compartment pressures, or use of Doppler ultrasound. Release of pressure as soon as possible can lead to improved muscle blood flow and improved function.¹¹ Salvage of a functional limb is dependent on early recognition, appropriate referral and treatment intervention in the form of decompressive fasciotomy.

Figure 1 Sentinel lesion on the flexor aspect of the forearm. The hand and forearm appear swollen and discoloured.

Learning points

- ▶ A sentinel lesion and clinical findings of a swollen hand with decreased blood flow must alert the clinician to the possibility of compartment syndrome.
- ▶ In order to maximise future limb function and reduce impairment, early recognition of the compartment syndrome and decompressive fasciotomy is key.

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Case reports provide a valuable learning resource for the scientific community and can indicate areas of interest for future research. They should not be used in isolation to guide treatment choices or public health policy.

ORCID iD

Mintoo Tergestina <http://orcid.org/0000-0002-2251-8543>

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