

MCN for Neonatology

West of Scotland

Neonatal Guideline



Management of Neonatal Arterial Occlusion & Thrombosis

Introduction

This guideline is applicable to doctors, nurses, ANNPs working with neonates in the West-of-Scotland. This guideline is intended to provide guidance on the acute management of suspected arterial thrombosis in the neonate.

Neonatal arterial thrombosis is uncommon in the neonatal period but can be life threatening and a cause of serious long-term morbidity. The single most important risk factor identified in the literature is secondary to indwelling arterial catheters (umbilical arterial catheters, peripheral arterial lines) ⁸.

What to do

The initial diagnosis of arterial thrombosis is a clinical one. **It is a clinical emergency and should be discussed promptly with the Neonatal Consultant on-call.** If plastic surgery input is needed, baby should be promptly discussed with the team at the Royal Hospital for Children, Glasgow.

Examination

Clear documentation in the baby's notes of:

- Time
- Affected limb and location
- Colour
- Presence of pulses: poor/absent regional pulses
- Perfusion: capillary refill time (CRT)
- Any skin changes including blistering and necrosis
- Pain/irritability

Management

Aims:

1. Halt thrombus propagation and improve tissue perfusion
2. Avoid reperfusion syndrome – further injury caused to the tissues in the affected area by reintroducing blood flow and resultant oxygenation causing increased production of free radical and reactive oxygen species.
3. Prevent life-threatening consequences of embolism

Interventions

DOs

- Affected limb should be positioned in a semi-flexed position taking the strain off the joints. **Do not** elevate the limb.
- Maintain normothermia.
- Check the following blood tests:
 - o FBC (Platelet count, haematocrit)
 - o Coagulopathy screen (APTT, PT & fibrinogen)
 - o Group & Save
 - o Blood Gas.
- Assess fluid status of the baby. If signs of hypovolaemia then fluid resuscitate as appropriate.

DON'Ts

- Local massage of the affected area is no longer recommended.
- Apply topical glyceryl trinitrate (GTN) patches. This is **NOT** recommended and these should only be applied following discussion with specialist Plastic Surgery teams.

Review Patient in One Hour

If there is no improvement further investigations and referral is essential.

Referral

Urgent referral to Royal Hospital for Children, Glasgow. Call the **ScotSTAR emergency line on 03333 990 240** and request a conference call with the following participants:

1. ScotSTAR Neonatal Consultant
2. RHC, Glasgow Receiving Neonatal Consultant.
3. RHC, Glasgow On-call Plastic Surgery Consultant.
4. RHC, Glasgow On-call Haematology Consultant.

IMAGING

1. Cranial Ultrasound

- Assessment of Intraventricular haemorrhage.
- Aiming to identify source of thrombus.

Further imaging: if not available locally will be performed at RHC, Glasgow

2. Ultrasound of affected limb with Doppler (if available)

- To confirm location and size of thrombus.

3. Echo

- Within 8 to 12 hours: aiming to identify source of thrombus.

Medical Management

The only medical management that should be initiated in the first 12 hours is unfractionated heparin. Decision to treat requires MDT discussions with the neonatal team, plastics team and haematology team. Dosing and monitoring guidance available through the link below:

<https://www.clinicalguidelines.scot.nhs.uk/nhsggc-guidelines/nhsggc-guidelines/haematologyoncology/anti-thrombotic-therapy-haematology/>

Unfractionated heparin is the treatment of choice for initial anticoagulation. Going forward, there is an option to change to subcutaneous low molecular weight heparin.

Surgical Management and Thrombolysis

There is a 12 hour window for assessment of the patient for consideration of thrombolysis and/or surgical intervention. This decision should be made with reference to the location of the insult and gestation of the infant and will involve input from neonatology, plastics and haematology.

References:

- Hack WW, Vos A, Okken A. (1990) Incidence of forearm and hand ischaemia related to radial artery cannulation in newborn infants. *Intensive Care Medicine*. 16(1):503.[III]
- Furfaro S, Gauthier M, Lacroix J, Nadeau D, Lafleur L, Mathews S. (1991) Arterial catheter-related infections in children. A 1 year cohort analysis. *American journal of Disease in Childhood*. September;145 (9):1037-43. [III]
- Hack, W.W., Vos, A., Okken, A. (1990) Incidence of forearm and hand ischaemia related to radial artery cannulation in newborn infants. *Intensive Care Medicine*. 16(1):503.[III]
- Mense, L., Rose, S., Bruck, A., Rüdiger, M., Kaufmann, M., Seipolt, B. (2022). Peripheral Arterial Lines in Extremely Preterm Neonates. A Potential Alternative to Umbilical Arterial Catheters. *Advances in Neonatal Care*. Volume 22, Issue 4, 357-361.

Document Properties

Document Title

WoS_ArterialThrombosis_Neonates

Document Author

Lavinia Raeside, Advanced Neonatal Nurse Practitioner, RHC, Glasgow.
Dr Andrew MacLaren, Consultant Neonatologist, RHC, Glasgow

Other Professionals consulted

Mr David McGill, Consultant Plastic Surgeon, RHC, Glasgow
Claire Gardner, Tissue Viability Nurse, RHC, Glasgow.

Implementation and review dates

Implementation date 03/06/2024

Next review 01/06/2027