

## Neonatal Femoral Artery Occlusion in Delivery Room

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### Abstract

Although arterial occlusions are relatively uncommon in newborns, the management of arterial occlusion in newborns is still controversial and there is a lack of consensus. We report a newborn infant with acute femoral occlusion at delivery. Conservative, medical treatment was chosen considering the prematurity of the baby and the high risks of bleeding associated with thrombolytic therapy. Six hours after initiation of medical therapy, the femoral blood flow was restored in Doppler ultrasonography. Arterial occlusions in the newborns are rare but challenging events. Sharing experiences may help clinicians in building a consensus on managing arterial occlusions.

**Keywords:** Arterial occlusion; Newborn; Management

### Background

Primary occlusion of major arteries in newborn is fortunately a rare condition with a frequency of one in 4500 births [1]. There is limited published data on the diagnosis and management of neonatal limb ischemia. Consensus on appropriate interventions and management protocols is not well established.

We report a newborn infant with acute femoral occlusion at delivery with a brief review of the literature.

### Case

This male infant was the product of 32 week twin gestation and the pregnancy was uncomplicated until a week before term, when a deceleration of fetal heart rate was observed and an emergency delivery performed by Cesarean Section. Obstetric USG showed the fetus was not in a breech position and not squished at the waist, it was in normal position. The baby had a birthweight of 1890 grams and an APGAR score of 5. He was cyanotic, but after short ventilation by balloon mask, his extremities became pink and warm except the right limb. Five minutes after delivery, the APGAR score was 9, the baby was crying and active with a positive Moro reflex. No sign of injury was present, but his right limb was still pale and cold (Figure 1).

The baby was immediately transferred to our neonatal intensive care unit. On physical examination of the extremities, the right femoral

pulse was palpable, but the popliteal and the pedal pulses were absent. The other extremities had normal pulses. The physical examination of baby revealed no other problem. A pulse oxymeter placed on the right foot did not detect any pulse, while an oxygen saturation of 99% and a 156 beats/min pulse rate was recorded at the left foot. Color Doppler ultrasonography (USG) was used to confirm the diagnosis and the site of occlusion. The flow velocities were low at the proximal right femoral artery, and the blood flow was abruptly interrupted at mid-thigh level. No pathologic findings were detected on the left limb. Echocardiography revealed normal cardiac functions and anatomy.

The neonate was placed under an open warmer bed and intravenous (IV) hydration was started immediately. Vascular and pediatric surgeons recommended primarily medical treatment. Thrombolytic therapy and/or thrombectomy would be considered only if the leg would exhibit signs of sustained severe ischemia.

Intravenous pentoxifylline was administered at a dose of 7.5mg/kg/dose q6 hours. Six hours after initiation of medical therapy, the leg became pink and warm, the popliteal and pedal pulses were palpable and the femoral blood flow was restored in Doppler USG.

Pentoxifylline was continued for 5 days. There were no abnormal results on hematological and biochemical tests. Methylenetetrahydrofolate reductase (*MTHFR*) and Factor-V Leiden mutations were negative. Other tests for thrombophilia screening were planned after discharge.

### Discussion

Although arterial occlusions are relatively uncommon in newborns, neonatal limb ischemia could be limb threatening [2-4]. The management of limb ischemia and arterial occlusion in newborns is still controversial and there is a lack of consensus [5,6].



**Figure 1:** The right leg of the baby is pale and pulse oxymeter probe detects pulses from left leg. The picture was taken soon after delivery (30 minutes).

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Other than the classical depiction of Virchow's triad as mechanism of thromboembolism, chorionic vessels embolizing to fetal vessels, local thrombi related to patent ductus arteriosus, increased blood viscosity, polycythemia, poor deformability of newborn red blood cells and congenital prothrombotic disorders may be of special interest in the newborn period [7,8]. Emergency cesarean delivery and maternal diabetes or very high BMI of infant are risk factors for arterial occlusion and iatrogenic vascular injuries must also be considered in the etiology [2].

In the present case, the possible risk factors include emergency cesarean delivery, increased blood viscosity, polycythemia and poor deformability of newborn blood cells. We tested only Methylene tetrahydrofolate reductase (*MTHFR*) and Factor-V Leiden mutations for congenital thrombophilia; the baby was referred to a pediatric hematologist for further evaluation.

Imaging techniques for detection of occlusion site include Doppler USG, computed tomography and MRI angiography. Although arteriography remains the gold standard, Doppler USG is non invasive, readily available and adequate [1,6]. We used Doppler USG to confirm the diagnosis and interruption of arterial blood flow was observed at mid upper limb.

We chose conservative, medical treatment considering the prematurity of the baby and the high risks of bleeding associated with thrombolytic therapy. Adequate hydration, keeping the extremity warm, IV pentoxifylline and close observation resulted in the regression of the symptoms. Pentoxifylline may help restoring impaired blood flow by normalizing red cell deformability and decreasing blood viscosity [9].

Arterial occlusion in the newborn is a rare but challenging event. Sharing experiences may help clinicians in building a consensus on managing arterial occlusions.

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