

## Acute Femoral Artery Thrombosis of the Lower Limb in a Newborn: A Case Report and Literature Review

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**Abstract:** Neonatal arterial thromboses are rare and generally associated with an arterial umbilical catheter. There are cerebral or aortic thromboses, rarely distal thromboses. We report the case of a 7-day newborn admitted to pediatric emergencies for arterial thrombosis of the right lower limb complicating hypernatremic dehydration, treated with heparin with favorable evolution and total regression of the signs.

**Keywords:** thrombosis, lower limb, dehydration, hypernatremia, heparin.

### INTRODUCTION

Arterial thromboses are rare in newborns, mostly caused by arterial catheters. Neonatal arterial thrombosis occurring in other contexts is much rare. The clinical symptomatology differs according to the location, and the extent of the thrombosis. Their diagnosis is better ensured by the imaging techniques.

The management of neonatal spontaneous arterial thrombosis differs from one center to another. We report the case of a 7-day newborn admitted to pediatric emergencies for cyanosis of the lower right limb with favorable clinical evolution under medical treatment alone and discuss the diagnostic, therapeutic and evolutionary aspects through a review of the literature.

### OBSERVATION

This is a 7-day male newborn from a term pregnancy; the mother was primiparous. Pregnancy was marked by the installation of gestational diabetes and the delivery was uneventful. The Apgar score was 9/10/10 in the 1st, 5th and 10th minute, birth weight at 3200g. The blood tests at birth were normal. Mom left maternity 48h after childbirth. On day 5 of life, parents notice an incessant crying, hypotonia with decreased frequency of feedings. At day 7 the parents noticed a cyanosis of the right lower limb arriving to the ankle and in front of the extension of the cyanosis, which extended to the upper 1/3 of the leg, they consulted pediatric emergencies, 12 hours after the beginning of symptoms. The clinical examination objectified: a hypotonic newborn, a dehydration fold, coldness of the lower right limb with cyanosis extended to the upper third of the leg, abolition of the popliteal and distal pulse. A weight of 2900g, which corresponds to a decrease of 10%. The blood pressure was 80-mmHg systolic and 40 mmHg diastolic. Due to the loss of 10% of its birth weight, and the fold of dehydration, hypovolemic shock was suspected. The newborn

benefited from volemic expansion by macromolecules and intravenous rehydration, he quickly spread to filling with normalization of blood pressure figures. The blood test on admission objectified a normal blood counts formula, normal crush workup, a hyper-natremia at 168 mmol / L, a serum potassium at 4.7 with a normal C reactive protein. A Doppler ultrasound of the lower limb was performed, showed a permeability of arterial axes up to middle 1/3 of thigh, with no distal arterial flow without visualization of thrombosis. Transthoracic echocardiography was normal. Thrombophilia checkup was normal. The diagnosis was an arterial thrombosis complicating hypernatremic dehydration related to lack of intake by refusal of feedings. The treatment consisted of an injection of 100 units / kg of unfractionated heparin into a bolus, followed by 20 units / kg / h, which allowed to have a normal activated thromboplastin time. The evolution was marked by the progressive regression of the cyanosis at the end of 24h, which went from the upper 1/3 of the leg to the ankle then disappearing after 3 days with warming of the limb, recovery of the popliteal and distal pulse and recovery of mobility.



**Fig-a, b: images showing ischemia of the lower limb, with folds of dehydration**

## DISCUSSION

Arterial thromboses are rare in neonates, but their incidence seems to increase because of the wider use of vascular catheters, the survival of very premature babies and the particularities of hemostasis in the sick newborn [1]. The main other causes of arterial thrombosis of the newborn after iatrogenic causes are perinatal asphyxia (PNS) and sepsis, during which the endothelial regulation balance leans heavily towards a procoagulant state. An PNS was present in 80% of the 20 cases of aortic thrombosis reported by Vailas et al. PNS and sepsis rates were 25% and 22%, respectively, in the series of Nowak-Gottl et al. In Schmidt and Andrew's, 21% of thromboses were related to sepsis. Blood hyper viscosity is also a classic cause of thrombosis. It is found in polycythemia, dehydration in newborns of diabetic mothers as our case, in the cyanotic congenital heart defects and patent ductus arteriosus. Cases of arterial thrombosis have also been reported in cases of mono-chorale twin pregnancy with or without transfusion-transfused syndrome. Viral infections have been implicated in the genesis of neonatal vascular thromboses for nearly 30 years [2].

Factors involved in thrombogenic risk in the neonatal period were mainly factor V and II mutations, protein C and protein S deficits, antithrombin deficits, elevated lipoprotein A, the presence of phospholipids and the recurrence of venous thromboses [1,3]. Acute ischemia of newborns related to heterozygosity of the MTHFR 677C-T gene mutation, and a mutation of the factor V Leiden gene, have been reported [4,5]. The administration of some drugs, such as indomethacin during pregnancy [6], may be associated with some forms of acute ischemia of the newborn. Daskalaki *et al.* Reported acute ischemia in an infant due to infection with *Streptococcus beta-hemolytic group A* [7]. But literature reports cases of idiopathic acute ischemia [8].

The positive diagnosis of acute ischemia is clinical. Imaging would invalidate the diagnosis in pre-therapeutic purposes. Doppler ultrasound is often sufficient, but in some cases, arteriography or CT angiography may be used [8]. In our case, Doppler

confirmed the diagnosis. Therapeutic indications are not codified by a specific treatment protocol. They depend on the extent of the thrombosis, its seat, the effectiveness of the alternate circulation, the possible existence of organ damage such as kidney failure, the general condition of the newborn, the habits of the health care team and finally the availability of different treatments [9, 10].

For treatment of femoral arterial thrombosis (complicated or not) in neonates and children, the American College of Chest Physicians recommends first-line the use of unfractionated heparin (Grade1B) or low molecular weight heparin ( LMWH) (Grade2C). The recommended duration of treatment is 5 to 7 days (Grade2C). Thrombolysis is recommended as second-line after failure of heparin (Grade 1C) in cases of complicated arterial thrombosis. Finally, surgical intervention is recommended in combination with UFH for contraindications to thrombolysis, when life threatening is involved (Grade1C) [11].

There is no consensus regarding the management of these neonatal arterial thromboses and practices vary from one center to another [12].

The evolution is often favorable when the diagnosis is made early, and the treatment is instituted in the best time. In our case, a delay of 12 hours since the beginning of symptoms has allowed a complete improvement of the symptoms under only the medical treatment.

## CONCLUSION

Although rare, neonatal arterial thromboses are serious. Etiology is dominated by arterial catheterization. The occurrence of arterial thrombosis outside of this context is possible, especially in case of severe infection, perinatal asphyxia or severe dehydration. As far as possible, treatment should be medical, even if the diagnosis is supposed to be late. Surgery is reserved for failures of medical treatment. Etiological research is essential in order to establish a

basic treatment to prevent recurrence, but it should be kept in mind that idiopathic acute ischemia exists.

#### REFERENCES

1. Saxonhouse MA, Manco-Johnson MJ. The evaluation and management of neonatal coagulation disorders. In *Seminars in perinatology* 2009 Feb 1 (Vol. 33, No. 1, pp. 52-65). WB Saunders.
2. S. Nouri-Merchaoui. *Archives de Pédiatrie*. 2012 ; 19:413-418
3. Nowak-Göttl U, Kurnik K, Manner D, Kenet G. Thrombophilia testing in neonates and infants with thrombosis. In *Seminars in Fetal and Neonatal Medicine* 2011 Dec 1 (Vol. 16, No. 6, pp. 345-348). WB Saunders.
4. Hakim A, Ben AH, Regaieg R, Gargouri A. Intrauterine upper limb ischemia due to a heterozygous mutation (677C> T) of the methylene-tetrahydrofolatereductase gene. *Archives de pediatrie: organe officiel de la Societe francaise de pediatrie*. 2014 Feb;21(2):194-7.
5. Khriesat WM, Al-Rimawi HS, Lataifeh IM, Al-Sweedan S, Baqain E. Intrauterine upper limb ischemia associated with fetal thrombophilia: a case report and review of the literature. *ActaHaematol*. 2010; 124(1):1-4.
6. Arad I, Bar-Oz B, Amit Y, Ergaz Z, Peleg O. Neonatal limb ischemia following maternal indomethacin treatment in twin pregnancies. *J Perinat Med*. 1995; 23(6):487-91.
7. Daskalaki MA, Boeckx WD, DeMey A, Franck D. Toxic shock syndrome due to group a beta-hemolytic streptococcus presenting with purpurafulminans and limb ischemia in a pediatric patient treated with early microsurgical arteriolytic. *J Pediatr Surg*. 2013 Jan; 48(1):e1-3.
8. Zaghoul R, Blitti CM, Jiber H, Bouarhroum A. Ischémie aiguë non traumatique du membre inférieur chez un nourrisson de 1 an: cas clinique et revue de la littérature. *Pan African Medical Journal*. 2015;21(1).
9. Schmidt B, Andrew M. Neonatal thrombosis: report of a prospective Canadian and international registry. *Pediatrics*. 1995 Nov 1;96(5):939-43.
10. 10/Beaufils F, Saizou C, Hurtaud MF. Les thromboses du nouveau-ne. *Arch Pédiatr* 2002; 9(Suppl. 2):137-9.
11. Monagle P, Chan AK, Goldenberg NA, Ichord RN, Journeycake JM, Nowak-Göttl U, Vesely SK. Antithrombotic therapy in neonates and children: antithrombotic therapy and prevention of thrombosis: American College of Chest Physicians Evidence-Based Clinical Practice Guidelines. *Chest*. 2012 Feb 1;141(2):e737S-801S.
12. Brice J. Venot P, Colinart-Thomas M, Morville P. *Archives de Pédiatrie*. 2016;xxx:1-6.