Spastic hemiparesis and presumed prenatal embolisation

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SUMMARY

An infant with clinical evidence of prenatal right subclavian arterial occlusion subsequently developed left hemiparesis with cystic infarction of the territory of the right middle cerebral artery. Perinatal strokes have not been reported with signs of limb ischaemia at birth; this finding may be a warning of possible simultaneous cerebral infarction.

Embolic\(^1\)\(^2\) and thrombotic\(^3\) events, as well as primary haemorrhagic lesions in association with congenital vascular malformations or tumours\(^1\) cause strokes or cerebral infarction in neonates and the fetus.\(^2\) Strokes occurring early in fetal life result in cortical neuronal loss and architectural changes ranging from hydranencephaly to porencephaly\(^4\); if they occur later in gestation or in infants born at term, they are characterised by cystic changes similar to those found after cerebral infarction in adults.\(^1\) Infarction due to thromboembolic disease may not be limited to the brain; other organs or parts may be obstructed simultaneously.\(^1\) The detection of external vascular obstruction such as peripheral cyanosis and an absent pulse in a limb should therefore raise the possibility that a vascular occlusion of a more vital part (such as the brain) had occurred at the same time.

We report an infant who presented with short lived cyanosis of the fingers and an absent pulse in the right upper limb; these were the only abnormal findings in the neonatal period but she was subsequently discovered to have had an infarct of the ipsilateral part of her brain.

Case report

A baby Asian girl was born in Scotland at term following an uneventful pregnancy and labour. The placenta was described as incomplete with ragged membranes. The antenatal history was unremarkable.

The infant's birth weight was 2760 g, length 55.5 cm, and head circumference 33.5 cm. Apgar scores were 9 and 10 at one and five minutes, respectively. Cyanosis of the right fingers and limitation of movement of the right upper limb were noted. No pulses were palpable in the right upper limb but elsewhere they were normal. The arm and forearm circumferences, measured at midpoints, were 1.0 cm smaller on the right than on the left. The rest of the physical examination was unremarkable.

Plain radiographs of the cervical spine, chest, and right shoulder were normal. A full blood count on day 1 yielded the following results: haemoglobin concentration 223 g/l; packed cell volume 63%; white cell count 20.2\(\times\)10\(^9\)/l and platelet count 80\(\times\)10\(^9\)/l. Viral studies were all negative. A splint was applied to the affected limb.

On the second day of life the tip of the right ring finger had become dark blue, though the other fingers were viable. Doppler ultrasound scan of the affected limb detected pulsation in the right subclavian artery to the outer border of the first rib, but not beyond. Over the next 72 hours the Doppler pulsation became audible in the axillary artery down to the radial artery and pulses could be felt. The infant remained otherwise well.

On discharge at the age of 2 weeks movements in the affected limb had considerably improved and all the pulses were palpable. The range of active movements of the left limbs were within normal limits. Because the improvement was so rapid no further investigations were carried out. The child subsequently failed to attend the follow up clinic.

At the age of 7 months the infant was brought back to the clinic the mother complaining that since the age of 4 months the child had had limited use of her left limbs; she had otherwise been well. A full neurological examination showed a left spastic hemiparesis and left hemianopia. The head circumference had dropped to the 10th centile having been on the 25th centile at birth. Her right upper limb was normal, as was her social behaviour. Computed tomography brain scan at the age of 7 months showed a cystic lesion in the area of the right middle cerebral artery with shrinkage of the right hemisphere (figure). When reviewed at 17 months of age, she could only move about by shuffling on her bottom but she appeared cognitively normal and no seizures had been observed.

Discussion

The presence of muscle wasting in the ischaemic
Hemiparesis and prenatal embolisation

The occurrence of hemiparesis in neonates is usually the result of infarction of the anterior cerebral artery, due to thromboembolism. Although cerebral vascular accidents are usually restricted to term infants, cases have been described in infants born preterm. 

In a majority of cases, the causative agent is the chorionic villi or placenta, causing thrombosis of the carotid artery. This results in an embolus, which may be either large or small, blocking the flow of blood to the brain. 

There are some cases where the cause of hemiparesis cannot be identified, either because the placenta is not available for examination, or because the infarct is too small to be detected. In these cases, other factors such as congenital anomalies, infections, or metabolic disturbances may be responsible. 

In a case reported by Barmada et al., the cause of hemiparesis was not determined. The infant was born at 28 weeks gestation, with a birth weight of 1500 grams. At birth, the infant was noted to have a right-sided hemiparesis. Over the next few weeks, the condition improved and the infant was discharged home. 

References


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