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An unexpected cause of polyhydramnion

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We report the case of a girl born to a 31-year-old G3/P2. Pregnancy had been uneventful until 31 5/7 weeks when reduced fetal movements and polyhydramnion were noted. In our fetal medicine unit, esophageal atresia was suspected. TORCH serologies were negative; no amniocentesis was performed.

The girl was born at 37 3/7 weeks of gestation by Cesarean section due to breech presentation with extended legs and progressive polyhydramnion. Apgar scores were 2, 4 and 6 at 1, 5, and 10 minutes, respectively. Arterial cord blood pH was 7.28. Birth weight was 2670 g (P10-25) and head circumference was 34.5 cm (P50-75). The girl initially required bag-mask ventilation due to lack of respiratory effort and bradycardia, and subsequently intubation and mechanical ventilation. An orogastric tube was inserted easily and gastric fluid could be aspirated, hence esophageal atresia could be excluded.

Examination at birth revealed skeletal and neurological abnormalities. She had stiffness of elbow, hand, knee and ankle joints consistent with arthrogryposis multiplex congenita, as well as clinodactyly of all fingers. Furthermore, X-ray revealed a fracture of the right humerus. The girl was encephalopathic with only very limited spontaneous movements, mainly when disturbed, and facial diplegia. Her posture showed extended legs and flexed arms. There was pronounced spasticity of upper and lower extremities, and ten-

don reflexes were exaggerated with cloni. No sucking or swallowing was observed nor were the primitive reflexes present. She was continuously fistling. On day 3 of life, extubation was attempted but failed due to secretions. There was no improvement or change in her neurological condition throughout her hospitalization.

We suspected a neurologic disease involving primarily the central but possibly also the peripheral nervous system and considered the following differential diagnoses:

- structural cerebral abnormalities
- symmetrical thalamic lesions
- inborn error of metabolism (especially lysosomal storage disease)
- neuropathy
- congenital myasthenic syndrome
- congenital myotonic dystrophy
- myopathy

Diagnostic algorithm

	Peripheral nervous system	Central nervous system
Signs and symptoms	Severe weakness	Mild to moderate weakness
	Reflexes decreased/normal	Reflexes brisk, cloni
	Facial diplegia	Absent primitive reflexes
	Fasciculations	Fisting of hands
	Intact alertness	Decreased alertness
	No seizures	Seizures
Investigations	Creatine kinase	EEG
	Genetic analysis	CSF analysis
	Electrophysiology	Metabolic work-up
	Muscle biopsy	Neuroimaging

Symptoms of peripheral versus central nervous system pathologies and suggested diagnostic work-up.

Therefore, an extensive diagnostic work-up was performed (Table). Laboratory parameters were normal including blood gas analysis, lactate, liver enzymes, creatine kinase, Guthrie test and acetylcarnitin profile. Oligosaccharides and glycosaminoglycanes in the urine were within normal limits. Cerebrospinal fluid cell count, glucose and lactate levels were also normal.

Repeated cranial ultrasound examinations revealed progressive, diffuse increase of echogenicity in both thalami (Fig. 1). MRI and computed tomography showed no focal abnormalities. However, myelination was delayed and white matter volume loss was noted.

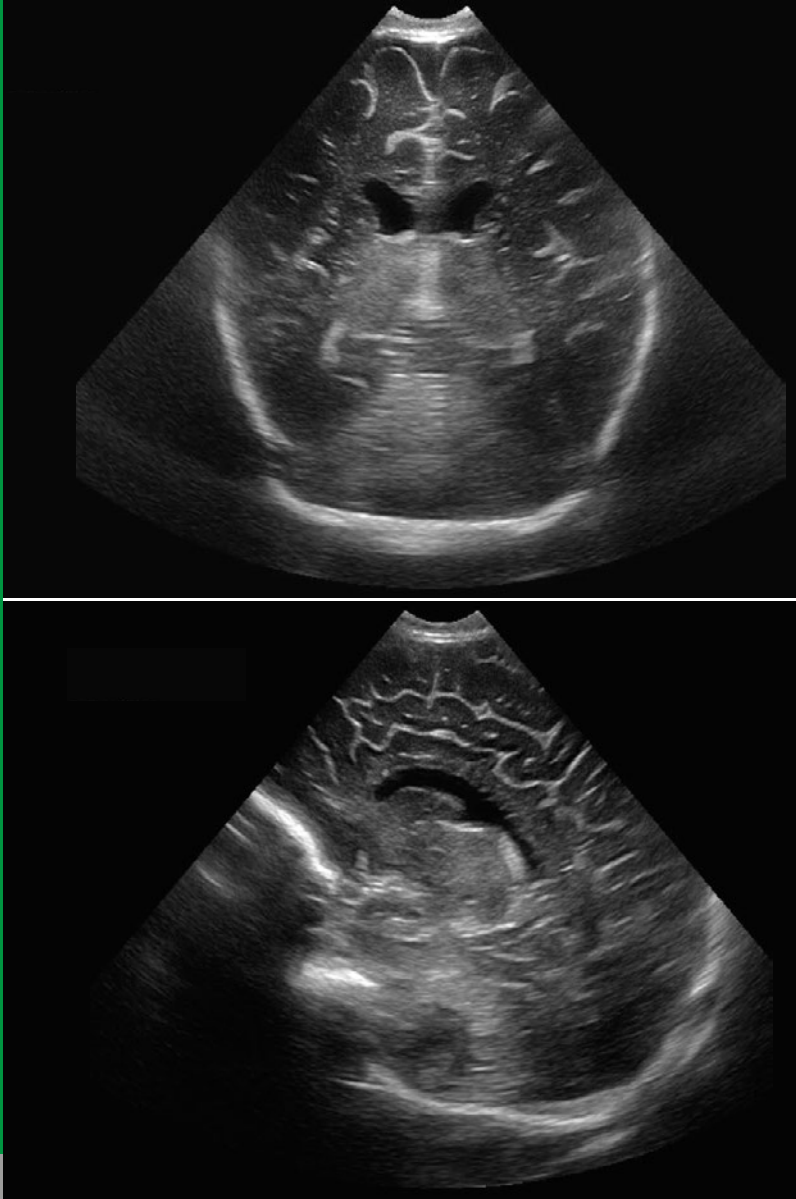


Fig. 1

Coronal and parasagittal cranial ultrasound images showing hyperechogenic thalami bilaterally, mild ventriculomegaly and increased extracerebral spaces.

EEG showed conspicuous baseline activity with intermittent tracé discontinue and bilateral multifocal sharp waves fronto-temporally. Electrophysiological examinations were normal, ruling out myopathy, neuromuscular junction disease or peripheral nerve lesions. Genetic analysis revealed a normal amount of triplet repeats on chromosome 19, excluding myotonic dystrophy type 1.

The clinical presentation and the progressive increased echogenicity in both thalami were consistent with symmetrical thalamic lesions. Given the poor prognosis of this disease, it was decided together with the parents to withdraw life-sustaining support. The girl was extubated and died one hour later in the arms of her mother at the age of 40 days. Autopsy was refused.

DISCUSSION

Symmetrical thalamic lesions (STL) in infants represent an extremely rare condition (1–4). The disorder is associated with severe neurological impairment and early death. Characteristic observations in patients with STL include polyhydramnion, absent suck and swallow, absent primitive reflexes, absence of spontaneous movements, facial diplegia, spasticity at or within days after birth, lack of psychomotor development and death within days or months (1–5). Pathological findings include loss of neurons, gliosis and neuronal mineralization in the thalami (1,2,4,5). The lesions can often, but not always, be demonstrated by computed tomography, MRI or cranial ultrasound (5,6).

The etiology of the disease is still unknown. The severe clinical course with marked spasticity already evident at birth or within a few days after birth suggests a prenatal origin (1). Birth injury and toxic or infectious agents have been speculated to be causative (2-4). Abuelo et al. reported the first observation of two cases of symmetrical infantile thalamic degeneration with normal antenatal course in one family in 1981, suggesting a possible genetic etiology (3). However, no other reports pointing to a genetic cause have been published since then. Most authors consider prenatal hypoxic-ischemic damage to be responsible for the disease (1,5). Symmetrical thalamic lesions are known to be a pathological feature of hypoxic-ischemic encephalopathy in infants (6,7). Basal ganglia/thala-

mus and brainstem tegmentum pattern of injury with relative sparing of cerebral cortex and white matter has been described in association with severe abrupt insults, such as cord prolapse, uterine rupture, severe placental abruption, or maternal cardiac arrest (8). The selective vulnerability of the thalamus and basal ganglia to hypoxic-ischemic insult is characteristic for full-term rather than preterm infants and seems to be related to glutamate-induced neuronal damage (1,7,9). Because the evolution of the hypoxic-ischemic insult is so rapid that systemic circulatory responses to preserve brain and cardiac blood flow while restricting flow to other organs are not fully operative, multiple organ failure is often absent (8).

Our case, like most cases of neonatal STL, lacks evidence of pre- or perinatal asphyxia. Presumably, an acute hypoxic-ischemic event occurring two to four weeks before birth is the origin of the disorder (1,5). This assumption is in line with the pregnancy histories of some of the published cases of STL, e.g. polyhydramnion (1,5), abnormal cardiotocography 11 days before delivery (5), sudden loss of fetal movements three weeks before birth (5), and maternal trauma with subsequent labor four weeks before birth (10).

CONCLUSIONS

A clinical picture with lack of movement, absence of primitive, suck and swallow reflexes, facial diplegia, exaggerated tendon reflexes, spasticity from or within days after birth and lack of psychomotor development is indicative of symmetrical thalamic lesions, a disease with extremely poor prognosis. The origin of the disorder is possibly an abrupt hypoxic-ischemic event two to four weeks before birth.

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