

Hydrops fetalis

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Case summary.

Lethal congenital contracture syndrome 1 (LCCS 1, MIM 253310) is an autosomal recessive condition characterized by hydrops and total immobility of the fetus, detectable at the 13th week of pregnancy. Other typical findings are micrognathia, pulmonary hypoplasia, pterygia and multiple joint contractures. It is the most severe form of fetal motoneuron disease. A typical 22+5 gestational week old case is presented.

Clinical data.

32-year-old woman. First two pregnancies and deliveries normal. The third pregnancy ended with stillborn hydropic fetus at 22+5 gestational weeks. In present fourth pregnancy fetal hydrops and immobility were observed at 14+ weeks by ultrasound. In addition there were malpositions of the limbs. Abortion was induced at 23 weeks.

Fetal Autopsy.

The fetus was small for dates, weight 427g (641g), CH 24cm (31cm), CR 17cm (21,5cm), foot 32mm (44mm). The head was big with subcutaneous edema. The chin was extremely hypoplastic. The knees were hyperextended, the ankles and wrists in club position and elbows flexed with pterygia. The structure of internal organs was normal, but the lungs were severely hypoplastic, combined weight 4g (17g). Skeletal muscles were atrophic and the spinal cord was thin by eye.

Histology.

The mid thigh specimen extends from epidermis to periost. In dermis there are lymphatic channels and edema. The muscle is severely atrophic and consist only few groups of small muscle fibers of varying size and some nuclei without sarcoplasm.

The anterior part of the lumbal spinal cord is reduced, the normal three neuron groups and even single neurons can't be seen.

Diagnosis:

Lethal congenital contracture syndrome 1

Lethal congenital contracture syndrome 1 (LCCS1, MIM 253310) is an autosomal recessive condition characterized by total immobility of the fetus detectable at the 13th week of pregnancy, accompanied by hydrops, micrognathia, pulmonary hypoplasia, pterygia and multiple contractures. LCCS1 invariably leads to prenatal death before 32nd gestational week. Neuropathological analysis shows lack of anterior horn motoneurons, severe atrophy of the ventral spinal cord and hypoplastic, nearly absent skeletal muscles. The defective gene underlying lethal motoneuron disease LCCS1 is the mRNA export mediator GLE1. Mutation confirmed cases are known only in Finland until now.

Differential diagnosis:

Lethal arthrogryposis with anterior horn cell disease; LAAHD

Lethal arthrogryposis with anterior horn cell (LAAHD, MIM 611890) is another autosomal recessive phenotype, slightly milder than LCCS1 but also characterized by fetal akinesia, arthrogryposis and motor neuron loss in anterior horn of the spinal cord. These fetuses often survive delivery, but die early as a result of respiratory failure. Neuropathological findings resemble those of LCCS, but are less severe. The disorder can be caused by mutations in the GLE1 gene (602271) and is therefore allelic to lethal congenital contracture syndrome. The fetuses are

compound heterozygotes for the LCCS1 major Finnish mutation (Fin(Major) and a missense point mutation either in exon 13 or in exon 16.

Arthrogryposis or fetal akinesia deformation sequence (FADS) or Pena-Shokeir syndrome is unspecific clinical phenotype which is caused by any disorder with fetal immobility.

References:

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