TRISOMY 13 WITH CYCLOPIA AND PROBOSCIS A CASE PRESENTATION

D. Socolov[1], G. Iliev[2], D. Scripcaru[2], V. Gorduza[1], R.V. Socolov[1], M. Puiu[3]
[1]University of Medicine and Pharmacy "Gr.T.Popa", Iasi
[2]"Cuza Voda " Hospital, Iasi
[3]University of Medicine and Pharmacy "V. Babes", Timisoara

Abstract

The 3-rd of the "common trisomies", the trisomy 13, is less frequent than trisomy 21 or 18 and its usually fatal in the 1-st year of life. We present a case of a trisomy 13 with a "normal" triple screen at 16 weeks and a "normal" first trimester US, who was referred at 27 weeks for a US examination. The fetus had a severe growth restriction and some of the malformations which even rarely encountered in the routine US practice, they are classically associated with this kind of disease. The amniocentesis revealed a trisomy 13. The parents asked for the termination of the pregnancy. A female 600g fetus was born and died immediately after delivery, by the impossibility of breathing. Because fetuses with trisomy 13 have severe abnormalities, the sensitivity of prenatal sonography for the detection of this aneuploidy is very high, most studies reporting sensitivities greater than 90%. The main differential diagnosis of Trisomy 13 is Meckel Grubber syndrome. Recurrence of trisomy 13 is almost unknown. More than 80% of children with trisomy 13 die in the first month. Parents of infants with trisomy 13 caused by translocation should have genetic testing and counseling which may help then prevent recurrence.
Key words: trisomy 13, malformation, ultrasaound.

Introduction

The 3-rd of the "common trisomies", the trisomy 13, is less frequent than trisomy 21 or 18, occurring in 1/12000 live births [1]. It is usually fatal in the 1-st year of life, with only 8,6%survival rate after 1 year of life, because infants with trisomy 13 have numerous malformations, some of them incompatible with life. The ultrasound (US) examination is important in the detection of these abnormalities and of the severe growth restriction that accompanies this genetic disease.

We present a case of a trisomy 13 with a "normal" triple screen at 16 weeks and a "normal" first trimester US, who was referred at 27 weeks for a US examination. The fetus had a severe growth restriction and some of the malformations which even rarely encountered in the routine US practice, they are classically associated with this kind of disease.

Case report

A pregnant woman of 33 years old, IV G, I P (1 spontaneous abortion, 1 abortion by request, and 1 natural delivery of a normal 3800g baby), was referred at 27 weeks gestation for an ultrasound(US).

She has no significant past medical history, no history of any congenital defects in either her or her husband's family.

She declared a "normal "US 1-st trimester scan at 13weeks, a normal triple screen at 16 weeks. The patient had no IgM positive test for TORCH infections, but Ig G was positive for Toxoplasmosis and Rubella, and negative for syphilis and HIV.

The US scan revealed :

-a female fetus with 25weeks biometry, of 560g weight

-a fetal growth restriction with biparietal diameter and head circumference at 23 weeks (<2%) and abdominal circumference and femoral length at 26 weeks.

-microcephaly with difficulties of the examination of cerebral structures

-semi lobar holoprosencephaly

-severe midline facial defects: cyclopia, absence of the nose, proboscis

-postaxial polydactyly at the right hand

The amniocentesis revealed a trisomy 13.

The parents asked for the termination of the pregnancy.

A female 600g fetus was born and died immediately after delivery, by the impossibility of breathing.

The malformations mentioned at the US scan were confirmed at the necropsy.

Discussions

History: Thomas Bartholin described in 1656 the clinical picture of a patient that may with certainty be classified as trisomy 13[2]. Later clinical descriptions were reported by Feichtiger in 1943 and Otto Ullrich in 1951. In 1960 , Klaus Patau made the first cytogenetic description in one patient[3].

Mechanism of pathogenesis:

Trisomy 13 occurs when extra DNA from chromosome 13 appears in some or all of the body's cells.

- Trisomy 13 - the presence of an extra (third) chromosome 13 in all of the cells.
- Trisomy 13 mosaicism - the presence of an extra chromosome 13 in some of the cells.

- Partial trisomy - the presence of a part of an extra chromosome 13 in the cells.

The extra material interferes with normal development.

Chromosome studies show trisomy 13, trisomy 13 mosaicism, or partial trisomy.

Symptoms:

Infants with trisomy 13 are small for gestational age and microcephalic and have numerous malformations:

-midline facial defects such as: cyclopia (single orbit),with microphtalmia or anophtalmia, cebocephaly (single nostril) and cleft lip and palate (60-70%)

-midline CNS anomalies such as: alobar holoprosencephaly

-ears are often small and malformed

-a punched out scalp lesion over the left or right occiput called "aplasia cutis congenita".

-malformations of the limbs: postaxial polydactyly of the hands (75%), club feet, rocker bottom feet

-abnormalities of the genitalia: hypospadias, criptorchidism are common in boys whereas girls generally have hypolpasia of the labia minor

-congenital heart disease (>80%).[4,5]

-severe mental retardation

-decreased muscle tone

Because fetuses with trisomy 13 have severe abnormalities, the sensitivity of prenatal sonography for the detection of this aneuploidy is very high, most studies reporting sensitivities greater than 90%[6,7,8].

Some of the most common findings included: central nervous system anomalies (58%), cardiac defects (48%), facial anomalies(48%), growth restriction (48%), holoprosencephaly(39%), renal abnormalities(33%)[6]

On the other hand, a study performed via routine scanning reported a sensitivity of only 68,2% for the detection of 85cases of trisomy 13 [9] and the authors believed than when detailed scanning is undertaken, the performance would be better.

Paraclinic exams and tests:

Gastrointestinal x-rays or ultrasound may show rotation of the internal organs.

MRI or CT scans of the head may reveal a problem with the structure of the brain. The problem is called holoprosencephaly. It is the joining together of the two sides of the brain.

Chromosome studies show trisomy 13, trisomy 13 mosaicism, or partial trisomy.

Differential diagnosis:

The main differential diagnosis of Trisomy 13 is Meckel Grubber syndrome because of the similarity of the findings polydactyly, neural tube defects (posterior encephalocele) and enlarged echogenic kidneys[10].

Prognosis: The syndrome involves multiple abnormalities, many of which are not compatible with life. It accounts for approximately 1%of spontaneous first trimester miscarriages and has an extremely poor prognosis.

More than 80% of children with trisomy 13 die in the first month and less than 5-10% of them pass the first year of life.

For the alive babies with trisomy 13,complications begin almost immediately after delivery and may include:

- Deafness
- Feeding problems
- Heart failure
- Seizures
- Vision problems

Recurrence:

Recurrence of trisomy 13 is almost unknown, with zero being the most common percentage figure in formal series. However, there is a small risk of recurrence increasing with the maternal age, with the cutoff at age 31 and there are also women at increased risk for meiotic errors in general, compared with other women of the same age, with an increased risk of spontaneous abortion or life births with trisomies. [11] So, in general, an empiric risk of approximately 1% is usually given to patients[12]

Prevention: Trisomy 13 can be suspected at US examination, having many and severe malformations.

It can be diagnosed parentally by amniocentesis with chromosome studies of the amniotic cells.

Parents of infants with trisomy 13 caused by translocation should have genetic testing and counseling which may help then prevent recurrence.

The syndrome involves multiple abnormalities, many of which are not compatible with life. More than 80% of children with trisomy 13 die in the first month.

References

1. Hill LM: The sonographic detection of trisomies 13,18 and 21. Clin Obstet Gynecol 80:349, 1996
2. Thomas Bartholinus: Historiarum anatomicarum rariorum centuria III et IV. Ujusdem cura accessare observationes anatomicae. Petri Pavi Hafniae. Sumtibus Petri Haubold Bibl, 1656, 95.
3. K. Patau, D. W. Smith, E. Therman, S. L. Inhorn, H. P. Wagner: Multiple congenital anomaly caused by an extra autosome. The Lancet, London, 1960, I: 790.
4. Robert Kliegman, Waldo E. Nelson, Hal B. Jenson, Karen J. Marcdante, M.D., Richard E. Behrman. Nelson essentials of pediatrics, fifth edition,Philadelphia, Sounders, Elsevier, 233
5. L. Yeo, AM Vintileos, The 2-nd trimester genetic sonogram, In P.W.Callen (ed), Ultrasonography in Obstetrics and Gynecology, 5th Edition, Philadelphia, Sounders, Elsevier, 2007, 103-106
6. Lehman CD, Nyberg DA, Winter TC, et al: Trisomy 13 syndrome: Prenatal ultrasound findings in a review of 33 cases. Radiology 194:217, 1995.

7. Nicolaides KH, Snijders RJ, Gosden CM, et al: Ultrasonographically detectable markers of fetal chromosomal abnormalities. Lancet 340:704, 1992
8. Tongsong T, Sirichotiyakul S, Wanapirak C, et al: Sonographic features of trisomy 13 at midpregnancy. Int J Gynecol Obstet b76:143, 2002
9. De Vigan C, Baena N, Cariati E, et al: Contribution of ultrasonographic examination to the prenatal detection of the chromosomal abnormalities in 19 centres across Europe. Ann Genet 44:209, 2001.
10. Beryl R Benaceraf Ultrasound evaluation of Chromosomal abnormalities In Peter W. Callen Ultrasnography in obstetrics and gynecology 4th edi ion WB Saunders 2000-53-55.
11. De R. J. M. Gardner, Grant R. Sutherland, Chromosome abnormalities and genetic counseling, third edition, 262
12. Carey JC: Trisomy 18 and trisomy 13 syndromes. In Cassidy SB, Allanson JE (eds): Management of genetic syndromes. New York: Wiley, 2001, 419-420.

Correspondence to:
Puiu Maria,
Martir O Munteanu Street, No. 9,
Timisoara 300360,
Romania
Phone: +4-0256-226824,
E-mail: maria_puiu@umft.ro