THE SPONTANEOUS RESOLUTION OF CYSTIC HYGROMAS AND EARLY FETAL GROWTH DELAY IN FETUSES WITH TRISOMY 18

LYNDON M. HILL, TREvor MACPHERSON, DAWN RIVELLO AND CAROL PETERSON
Department of Ultrasound, Magee-Womens Hospital, University of Pittsburgh, Pennsylvania, U.S.A.

SUMMARY
The spontaneous resolution of cystic hygromas in fetuses with trisomy 18 may be due to a delay in lymphatic-vascular anastomosis. The severity of growth delay with trisomy 18 appears to be variable in time of onset and extent.

KEY WORDS Trisomy 18 Cystic hygroma

INTRODUCTION
The improved resolution obtained with current ultrasound equipment has permitted sonologists to delineate normal fetal anatomy in increasingly finer detail (Hill et al., 1983). Detection of abnormal growth or a failure in the normal developmental processes has become possible through the use of ultrasound.

Cystic hygromas have been detected as early as the latter part of the first trimester (Bundy et al., 1986). Spontaneous resolution of cystic hygromas has been reported for chromosomally normal fetuses (Macken et al., 1989), as well as for fetuses with Down’s syndrome (Rodis et al., 1988) and Turner’s syndrome (Chodirker et al., 1988). We wish to report two cases of trisomy 18 in which the initial physical presentation was of a cystic hygroma and early growth delay. The cystic hygroma subsequently resolved in each case.

CASE REPORTS

Case I

CC is a 23-year-old G, P, who presented for an ultrasound examination with a uterine size greater than expected for gestational age. The patient was 13.5 weeks from a certain last menstrual period.

A twin pregnancy was diagnosed. The composite gestational age based on the biparietal diameter, head circumference, abdominal circumference, and femur length was 14.1 weeks for twin A and 13 weeks for twin B. A non-septated cystic hygroma was detected immediately behind the occiput and extending to the thoracic region on twin B.

A follow-up ultrasound examination at 16.2 weeks’ gestation revealed an increased disparity in the composite gestational ages of twin A (16.8 weeks) and twin B.
The cystic hygroma (twin B) was no longer present. However, because of the previously detected anomaly, the presence of bilateral choroid plexus cysts, and the size discordancy, a genetic amniocentesis was performed. The karyotype of the larger twin was normal, while the karyotype of the smaller twin indicated trisomy 18.

Case 2

CK is a 35-year-old G2P2 who was referred at 14-4 weeks' gestation with a presumptive diagnosis of cystic hygroma. The composite gestational age was 12-7 weeks. The diagnosis of a cystic hygroma was confirmed (Figure 1A).

At 19-4 weeks' gestation, the composite gestational age was 17-3 weeks. The previously noted cystic hygroma had resolved (Figure 1B). However, multiple bilateral choroid plexus cysts, deviation of the cerebellum into the posterior fossa (Figure 1B), a sacral meningomyelocele, and bilateral clubbed feet were now evident. A genetic amniocentesis established a diagnosis of trisomy 18.

DISCUSSION

The ultrasonic detection of congenital anomalies requires not only equipment with sufficient resolution, but also an understanding of embryological development and a knowledge of the time in gestation when a particular abnormality manifests itself.

Intrauterine growth retardation is a recognized sonographic finding in cases of trisomy 18 (Bundy et al., 1986; Golbus, 1978). Lynch and Berkowitz (1989) reported five cases of trisomy 18 in which a first trimester crown–rump length was at least 5 days smaller than expected by last menstrual period. In our first case, there was a 3-day difference between the gestational age by sonar and last menstrual period at 13-5 weeks; by 16-2 weeks' gestation, the size difference had increased to 6 days. A 12-day differential in gestational age assessment by sonar and last menstrual period was detected in case 2 at 14-4 weeks.

Recently, the antenatal detection of choroid plexus cysts in the second trimester has been associated with trisomy 18 or 21 (Clark et al., 1988; Gabrielli et al., 1989; Chan et al., 1989). However, autopsy studies indicate that the incidence of choroid plexus cysts in karyotypically normal fetuses and newborn infants is approximately 34 per cent (Chan et al., 1989). Hence, a consistent recommendation has not yet been established for those cases in which choroid plexus cysts are the only detectable fetal abnormality. In case 1, the detection of a cystic hygroma and bilateral choroid plexus cysts, in association with early fetal growth delay, was sufficient reason for recommending fetal karyotyping.

Cystic hygromas are congenital malformations of the lymphatic system. They consist of fluid-filled cavities most commonly in the nuchal region. In general, cystic hygromas extend from the upper portion of the occipital bone caudally and medially to the sternocleidomastoid muscle. They consist of two symmetrical cavities completely separated by a midline nuchal ligament (Chervenak et al., 1983).

At approximately 40 days of development, the paired jugular lymph sacs form a connection with the drain into the internal jugular veins, ultimately becoming the terminal portions of the right lymphatic and thoracic ducts. The jugular lymphatic obstruction sequence theory hypothesizes that in cases of cystic hygroma, the
Figure 1. Case 2. 14-1 weeks’ gestation. (Top) A septated cystic hygroma (arrows) is behind the fetal occiput and involves the region of the neck. (Bottom) At 19-4 weeks’ gestation the cystic hygroma is no longer present about the neck (arrows). The graticules demarcate the cerebellum. Bilateral choroid plexus cysts (arrow-heads) are present.

connection between the jugular lymphatic sac and jugular veins fails to form. Lymph consequently begins to accumulate within the surrounding tissues of the neck with enlargement of the sac (Chervenak et al., 1983). Van der Putte (1977) studied the lymphatic system in fetuses with cystic hygroma and generalized
oedema. The jugular venous connection was absent in all of the fetuses. However, the lymphatic system of the extremities and abdomen were highly variable with some cases having a virtual absence of lymphatics, while others had an increased number of atypical lymphatic vessels.

Bronshtein et al. (1989) have divided nuchal cystic hydromas into septated and non-septated lesions. In their series of eight cases, four were septated and four were non-septated. The latter group were chromosomally normal; serial ultrasound examinations revealed absorption of the cystic hygromas and three of the four resulted in normal term neonates. By the classification of Bronshtein et al. (1989), case 1 would be considered non-septated and case 2 septated. It should be noted, however, that a transaxial scan at the level of the cerebellum in the non-septated group results in a picture that is identical to the nuchal skin-fold thickness that has been associated with Down's syndrome by Benacerraf et al. (1987). Since the lymphatic system is involved in both instances, the sonographic depiction of nuchal skin-fold thickness and non-septated cystic hygroma can be considered part of the same continuum.

The lymph vascular system and cardiovascular system are intimately associated with one another. The vessels of the lymphatic system follow the main veins. Eventually the lymphatic and vascular systems anastomose at the junction of the internal jugular and subclavian veins. The increased incidence of cardiovascular abnormalities in fetuses with trisomy 18 is well known (Warkany et al., 1966). We hypothesize that the local disorders of growth and differentiation that result from an extra chromosome (Hall, 1966) may delay complete lymphatic anastomosis with the vascular system, resulting in a temporary build-up of lymphatic fluid in the nuchal area. Once the appropriate channels have been developed, the excess lymphatic fluid drains into the vascular system and the cystic hygroma resolves.

Spontaneous resolution of nuchal cystic hygromas has now been documented in normal fetuses, as well as in fetuses with Turner's syndrome and trisomies 21 and 18. Non-septated as well as septated cystic hydromas may be associated with chromosomal aneuploidies. The severity of growth delay with trisomy 18 appears to be variable in time of onset and extent, a feature which may influence the persistence or resolution of cystic hygroma.

REFERENCES


