Original Article

INTER TWIN MEMBRANE IN SONOGRAPHIC EVALUATION OF TWIN GESTATIONS

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ABSTRACT

Objective:

To assess the value of ultrasound measurement of twin dividing membrane thickness in predicting chorionicity.

Study design:

Observational study.

Sampling technique:

All patients with twin gestation presented at Radiology Department, Madina Teaching Hospital from Jan 2010 to December 2011.

Material and methods:

This was a prospective study of 60 twin pregnancies between 16-35 weeks gestation. Sonographic examination for presence or absence of membrane was done. If membrane is visualized, the thickness of membrane was measured using technique with measurements are taken only when membranes are parallel to ultrasound beam. The thickness of 2mm is taken as cutoff point for chorionicity. Twin gestation was classified dichorionic if either confirmed by histological examination of placenta or by clinical findings (the male and female gender of neonates or presence of two separate placentas at delivery).

Results:

Out of 60 twin pregnancies in which amnionicity and chorionicity could be determined, 45(75%) were dichorionic diamniotic, 14 (23%) were monochorionic diamniotic and 1(2%) was monochorionic monoamniotic. In 42 of these (45) a thick separating membrane was identified at least on one sonogram (93 sensitivity). Twenty scan were obtained on monochorionic pregnancies. Thin membrane was identified in 13 (65%) of these. In two patients (10%) the visualized membrane could not be categorized as thin/thick. No membrane can be identified in five (25%) patients.

Conclusion:

Membrane characteristic should be used in conjunction with other sonographic criteria such as number of placental sites and fetal gender to predict the chorionicity of twin pregnancy.

Key words: Chorionicity, amnionicity, twin gestation, placenta, monochorionic.

INTRODUCTION:

Twin pregnancies are classified into following three groups on the basis of number of membranes surrounding the fetuses: dichorionic diamniotic, monochorionic diamniotic, monochorionic monoamniotic. Prenatal sonographic determination of amnionicity and chorionicity is important in the clinical management because the prevalence of complication depends upon membrane composition. Dichorionic diamniotic gestation has the best prognosis

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and monochorionic monoamniotic the poorest.[1]

Ultrasound determination of chorionicity is believed to be most accurate if performed during the first trimester from 9-14 weeks, but most spontaneously conceived pregnancies are referred for ultrasound examination during the second or third trimester.[2,3] Assessing amnionicity and chorionicity during the second and third trimester may present serious challenges to even the most expert practitioner of ultrasonography.

The three determinators of chorionicity during the second and third trimester is the fetal gender, placenta number and inter twining membrane.[4] If two separate placental disks are seen, the pregnancy is dichorionic; likewise if twins are of the different genders, the pregnancy is most likely dichorionic. When a single placenta is present and twins are of same sex careful sonographic examination of dividing membrane with typically results in correct diagnosis. The evaluation of three features in the intertwine membrane will provide an almost certain diagnosis about chorionicity of a twin pregnancy. The thickness of intertwine membrane, numbers of layers visualized in membrane and assessment of junction of membrane with placenta for twin peak sign.[5,6] The presence or absence of this structure changes the clinical management of twin i.e., if no membrane is seen, the pregnancy is monochorionic monoamniotic type. When membrane is seen, it is important to differentiate dichorionic diamniotic from monochorionic diamniotic. The dividing membrane in dichorionic diamniotic is composed of two layers of amnion and two layers of chorion and thus is thicker than membrane in monochorionic diamniotic gestations, which contains only two layers of amnion. The ideal methodology for measuring membrane thickness has not been determined and techniques for measuring membrane thickness in publish studies lack uniformity. Some claim the best membrane thickness measurement are obtained when membranes are perpendicular to the ultrasound beam while others believe that parallel measurements are superior.[7,8]

The goal of our study is to assess the value of ultrasound determination of twin dividing membrane thickness in predicting chorionicity.

MATERIAL AND METHODS

This was an observational study carried out between January 2010 to December 2011 at Radiology Department of Madina Teaching Hospital, Faisalabad. The inclusion criteria for selection was patients having twin pregnancy between 14-37 weeks, 60 twin pregnancies were studied.

All the patients underwent sonographic examination two to three times during their pregnancy. Ultrasound equipment was NEMIO XG with 3.5MHGZ probe. Real time scanning for presence of membrane was done. If membrane identified thickness for intertwine membrane was done by a senior radiologist, membrane thickness was evaluated at different sites and mean was calculated. The

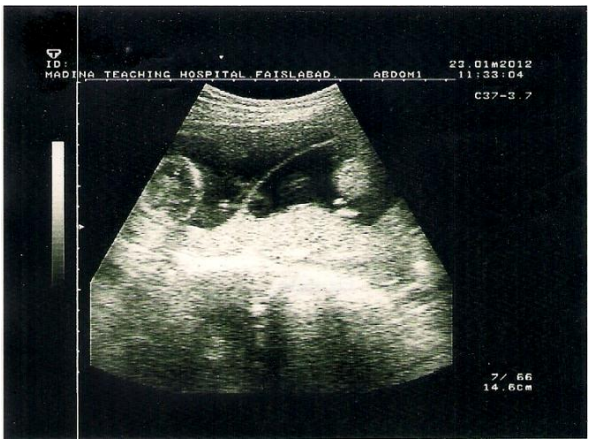

Figure 1. Dichorionic diamniotic twin pregnancy

measurements were taken when dividing membranes are parallel to ultrasound beam. The observer was blinded to other ancillary findings like number of placental sites, fetal gender.

2mm thickness was taken as cutoff. The patients having 2mm or more thickness of membrane was considered dichorionic pregnancy. Twin gestation was classified dichorionic if they satisfied at least one of the following clinical or pathological criteria i-e confirmed by histological examination of placenta or clinical findings (the male and female gender of neonates or presence of two separate placentas at delivery.

RESULTS

Out of 60 twin pregnancies in which amnionicity and chorionicity could be determined, 45(75%) were dichorionic diamniotic, 14 (23%) were monochorionic diamniotic and 1(2%) was monochorionic monoamniotic.

A total 130 sonograms were performed during the course of these pregnancies for an average 2.2%.

111 sonograms were performed in 45 dichorionic diamniotic.42 of these 45 a thick separating membrane was identified at least one sonogram (93 sensitivity).

The identification of membrane was related to age of gestation. A thick membrane was according seen 89% in second trimester, sharply decreased (40%) in third trimester.

Twenty scan were obtained on monochorionic pregnancies. Thin membrane was identified in 13(65%) of these .In two patients (10%) the visualized membrane could not be categorized as thin/thick. No membrane can be identified in five (25%) patients.

DISCUSSION

Because complication varies according to type of twining, prenatal sonographic determination of amnionicity and chorionicity can be instrumental in management of these pregnancies. Sonographic findings of two separate placenta or discordant fetal gender reliably diagnosed dichorionic diamniotic twin pregnancy. But in presence of fetus with concordant sex and single placenta determination of chorionicity by ultrasound relies entirely on assessment of dividing membrane.[9-12] However two separate placentas are seen in only one third of cases.[13] The placentas are fused. The presence of membrane always implies a diamniotic gestation, however to differentiate monochorionic from Dichorionic membrane thickness must be analyzed.[14,15] Because the chorionic membrane is considerably thicker than the amnion.

We found that thickness of the membrane separating the foetus was a good discriminator of chorion type in diamniotic twin gestations (93% sensitivity). A study Bracero and Byme gave sensitivity of 75.5% and specificity of 85.7%, determining dichorionic diamniotic pregnancy.[2] The difference in results was due to technique used in imaging the intertwine membrane. We take measurements when membranes are parallel to ultrasound beam. Furthermore visualization of membrane in twin is related to gestational age. In earlier gestation it is easier to detect but as pregnancy proceeds even thick membrane is difficult to image. We could see membrane in a thick membrane in 89% in second trimester, 40 third trimesters. This is due to decreased liquor with increasing gestation and crowding of fetal parts. In cases of thin membrane of monochorionic diamniotic MC-DA gestations, success of visualization was quite good. Because we specifically sought for membrane, demonstration of a thin membrane in a monochorionic gestation excludes monochorionic monoamnionitic twining and its extremely poor prognosis. So careful scanning for such membrane should be considered as an integral component in sonographic evaluation of twin.[16]

Uterine synaechie and amniotic bands are other sources of intrauterine membrane in pregnancy. Sonographic characteristic that distinguish this from true chorion and amnion include aberrant location that is not separating the fetus, disproportionately wide base and presence of free edge.[17,18]

In conclusion membrane characteristic should be used in conjunction with other sonographic criteria such as number of placental sites and fetal gender to predict the chorionicity of twin pregnancy.

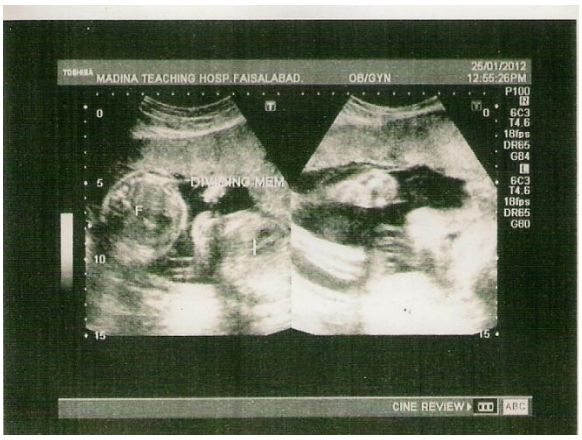

Figure 2. Monochorionic diamniotic twin pregnancy

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