ROLE OF ULTRASOUND IN EARLY DETECTION OF MOLAR PREGNANCY

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ABSTRACT

OBJECTIVES

The objective of this study was to investigate the role of ultrasound in the detection of early pregnancies presenting with placental molar changes.

METHODOLOGY

This retrospective study was carried out at Radiology department of Hayatabad Medical Complex, Peshawar, between Aug 2020 and July 2021. All cases suspected of molar changes were evaluated from 10-14 weeks of gestation. The patient were referred to our department because of fetal abnormality, maternal disease or age and family or previous pregnancy history or were identified from an ongoing ultrasound screening study for aneuploidy by measurement of fetal nuchal translucency thickness. Transabdominal or transvaginal sonography was used to examine the fetus and placenta.

RESULTS

Total 85 patients of molar pregnancies were enrolled in the study. Age ranged between 20 -45 years with a mean age of 32.5 years. There were 60(70.6%) complete moles (CM) and 25(27.4%) partial moles (PM) were suspected on ultrasound. In case of complete mole coexisting with a normal singleton or twin pregnancy, the molar placenta was clearly separated from the normal placenta, whereas with partial moles the molar structures were dispersed inside the placental mass.

CONCLUSION

Ultrasound detection of molar pregnancy remains a diagnostic challenge. Data suggest that there has been an increase in both the predictive value and the sensitivity of ultrasound over time; however, the diagnostic criteria remain ill defined. Prior to managing a miscarriage, being aware of the possibility of molar pregnancy will guide treatment and allow for adequate follow-up.

KEYWORDS: *Fetal Poles, Gestational Trophoblastic Disease (GTD), Snow Storm Appearance*

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INTRODUCTION

A molar pregnancy is a very uncommon condition affecting around 01 in 1,200 pregnancies. It is sometimes detected having an early pregnancy ultrasound.[1] It may also be diagnosed after a miscarriage, when the tissue that is collected or passed from the uterus is examined.[2] there are two types of moles i.e. complete and partial. Distinction between complete and partial hydatiform moles was originally made postnatally on the basis of gross morphological, histological and cytogenetic criteria.[3] Complete hydatidiform

moles are characterized by generalized swelling of the villous tissue and diffuse trophoblastic hyperplasia in the absence of embryonic or fetal tissue. Partial moles are characterized by focal swelling of the villous tissue and focal trophoblastic hyperplasia in the presence of embryonic or fetal tissue. Complete moles have a paternally derived diploid chromosomal constitution, resulting from the fertilization of an oocyte by a single spermatozoon which is diploid or undergoes disploidization, the maternal chromosomes are either inactivated or absent.[4] Partial moles are usually triploid and they mainly result from fertilization of a haploid ovum by either a single sperm that undergoes reduplication or two sperms.[4] Development of persistent gestational trophoblastic disease can occur with both complete and partial moles.[5,6] Prenatal diagnosis of moles is based on the ultrasonography demonstration of sonolucent areas within the placenta. In complete moles there is a characteristic "snow-storm" appearance in the absence of a fetus. The difficulty in prenatal diagnosis arises when sonolucent areas in the placenta are found in association with a fetus. Such features may represent a triploid or diploid partial mole, a twin pregnancy combining a normal fetus with its placenta and a complete mole, or benign hydropic degeneration such as mesenchymal dysplasis.[7] Existing data on the differential diagnosis and management of these conditions are derived from case reports or small retrospective series of affected pregnancies detected during the second half of gestation.[8] The aim of this study was to examine the role of ultrasound in the diagnosis and management of molar pregnancies detected at 11-14 weeks of gestation.

METHODOLOGY

This retrospective study was carried out at Radiology department of Hayatabad Medical Complex, Peshawar, between Aug 2020 and July 2021. All cases suspected of molar changes were evaluated from 10-14 weeks of gestation. The patient were referred to our department because of fetal abnormality, maternal disease or age and family or previous pregnancy history or were identified from an ongoing ultrasound screening study for aneuploidy by measurement of fetal nuchal translucency thickness.[9] Transabdominal or transvaginal sonography was used to examine the fetus and placenta. β-hCG was measured by an immunmetric assay. In those patients who choose to continue with the pregnancy, the investigations were repeated at monthly intervals. Additionally, the pulsatility index PI in the uterine arteries and maternal blood pressure were measured.[10] After delivery the placenta was karyotyped and a detailed histopathological examination was performed. If trophoblastic disease was confirmed by higstological examination (proliferation of the cytotrophoblast and enlarged villi with absence of fetal stromal blood vessels), the case was entered in the registry of Radiology Deptt for molar pregnancies. The maternal and fetal charts of the study population were reviewed for the following characteristics: ultrasound findings, prenatal diagnostic procedures, pregnancy complications and cytogenetic results. Pregnancy outcome was obtained from the maternity units or the patients themselves.

RESULTS

Total 85 patients of molar pregnancies were enrolled in the study. Age ranged between 20-45 years with a mean age of 32.5 years. There were 60(70.6%) complete moles (CM) and 25(27.4%) partial moles (PM) were suspected on ultrasound. In case of complete mole coexisting with a normal singleton or twin pregnancy, the molar placenta was clearly separated from the normal placenta, whereas with partial moles the molar structures were dispersed inside the placental mass Figure-1. The case shown in Figure-2 demonstrated cystic changes in the chorionic tissue typical of molar pregnancies. Figure-3 shows small cysts in the chorionic tissue and a relatively high proportion of trophoblast for a small gestational sac. Figure-4 shows abundant chorionic tissue with loss of the normal sac-like architecture. Figure-5 shows a small irregular gestational sac only and we were unable to see any features that could indicate a complete mole. Reviewing the images retrospectively and independently, 25 cases had US features that could have indicated a partial mole. However, the reviewers disagreed in 03 cases indicating a generally poor strength of agreement.

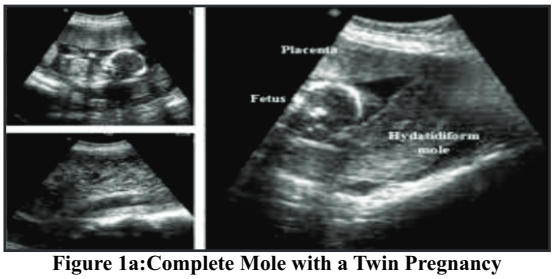

Figure 1a:Complete Mole with a Twin Pregnancy

Figure 1b: Partial Hydatiform Mole

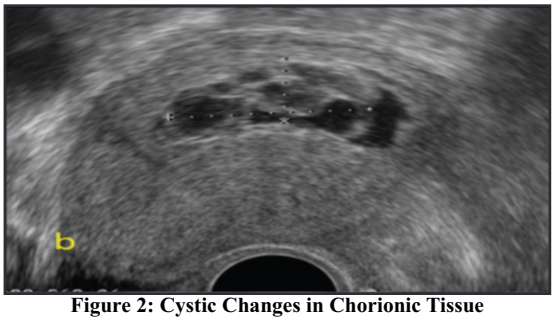

Figure 2: Cystic Changes in Chorionic Tissue

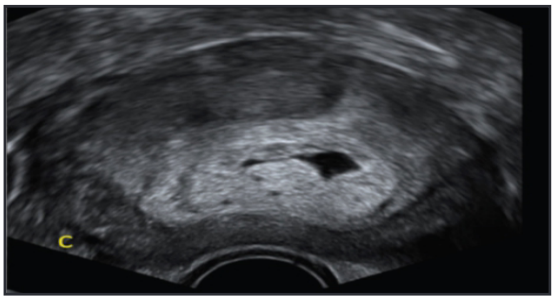

Figure 3: Cystic Changes in Chorionic Tissue

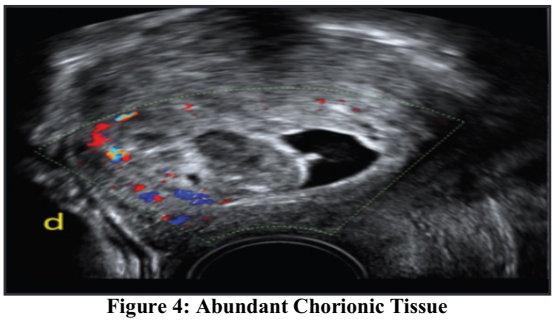

Figure 4: Abundant Chorionic Tissue

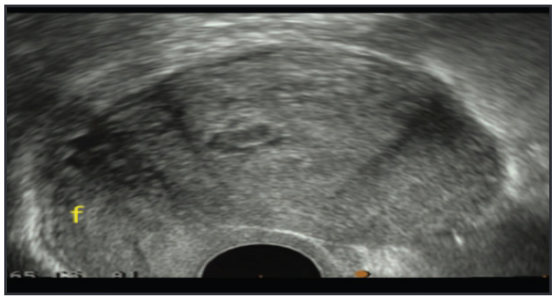

Figure 5: Small Gestational Sac

DISCUSSION

The ultrasound diagnosis of complete mole is usually straightforward and accurate, whereas the diagnosis of partial mole is more complex. The presence of any form of placental molar changes and a coexistent fetus has been and is still often referred to as a partial mole.[11] A partial mole must first be distinguished from a classical mole coexisting with a normal fetus and placenta. This complex trophoblastic disorder, resulting from molar transformation of one ovum in a dizygotic twin pregnancy, is associated with a higher risk for persistent trophoblastic disease than isolated complete mole and usually requires chemotherapy.[12] Vaginal bleeding is the most common presenting symptom in these cases and the mother is at high risk of developing severe medical complications such as pre-eclampsia, hyperthyroidism, respiratory insufficiency and ovarian hyper stimulation with torsion or rupture of theca lutein cysts. Complete hydatidiform mole with a coexisting fetus has usually been diagnosed after 20 weeks at a later gestational age than complete mole. We found that as complete mole produces a characteristic vesicular sonographic pattern and low uterine artery P1 measurements, their association with a normal gestational sac can be accurately determined at the end of the first trimester. As the molar placenta does not grow in proportion with the normal gestational sac, the ultrasound visualization of the tumor may be more difficult as pregnancy advances.[13] This study has shown that we are able to detect a higher proportion of molar pregnancies by pre-operative ultrasound than previously reported in the literature. An overview of previous studies showed that (44%) of molar pregnancies were suspected on USS pre operatively, with the US sensitivity for CM moles being much higher than for PM.[14] The overall increase in ascertainment in the current study was due to a lower proportion of PM in our population compared with other studies. This may reflect an increasing use of non-surgical treatment of miscarriage over time, but our data were fairly consistent. Since modern transvaginal ultrasound has been used routinely for the assessment of early pregnancies, the proportion of molar pregnancies suspected preoperatively has risen.[15] One of the strengths of our study was that we were able to identify pregnancies that were thought could be molar on ultrasound and establish whether the diagnosis was proven on histology so as to assess the value of a positive scan. This is important for sonographers and clinicians so that we can counsel

our patients regarding the odds of molar pregnancy before they choose the treatment of their miscarriage. Vargas R et al found a positive predictive value of 48% for the diagnosis of molar pregnancy.[16] Previous studies have only looked at cases where the diagnosis of a molar pregnancy was made histologically to give an estimate of sensitivity. It would be interesting to see whether our data are replicated in other units with a different clinical set ups, staffing and degrees of supervision, to see whether this pattern of diagnosis is consistent across modern practice. Savage JL et al retrospectively examined USS images of proven moles in an to attempt to grade the cystic changes in the placenta and vascularity; they found that PM were more likely to have recognisable embryonic and extraembryonic structures, were more vascular and less likely to consist of cystic placental tissue with no recognisable sac.[17] In their study, hCG did not appear to help to distinguish the two. Gadducci A et al. showed that there may be a role for hCG, but it is more likely to be raised in CM than PM, which is easier to diagnose on ultrasound anyway.[18] Our retrospective review of images showed that there were some cases of CM that could have been suspected by more experienced sonographers on USS prior to surgery, due to abundant chorionic tissue with loss of the normal architecture of the gestational sac, but that the main diagnostic difficulty is in distinguishing PM from uncomplicated first trimester miscarriage (i.e. early embryonic demise). Without a prospective study using predefined assessment criteria, the diagnostic criteria will never be rigorously assessed. Our study was limited by the retrospective analysis of data. We assumed that all pregnancies that were thought to be molar were explicitly stated as such in the ultrasound reports. It is possible that our sonographers may have recommended surgical management of miscarriage, but not made it expressly clear in the report that this was because they suspected an underlying molar pregnancy and wanted the remains to be examined histologically. We also had to assume that there was no additional GTD in patients with negative scans who did not have histological tissue for analysis. This was likely to be the case for malignant or invasive GTD, but it is quite possible that there were some cases of molar pregnancy that resolved with expectant or medical management of miscarriage without ever being suspected or detected. Without histopathological examination of all miscarriage tissue, the true false negative rate of ultrasound is impossible to gauge. Can we improve ultrasound detection of molar pregnancy? We have no diagnostic criteria that have been subject to testing for accuracy or reproducibility.

LIMITATION

The limitation of this study was that it was conducted in one teaching hospital of Peshawar and not collected the data from rest of the hospitals.

CONCLUSION

Ultrasound detection of molar pregnancy remains a diagnostic challenge. Data suggest that there has been an increase in both the predictive value and the sensitivity of ultrasound over time; however, the diagnostic criteria remain ill defined. Prior to managing a miscarriage, being aware of the possibility of molar pregnancy will guide treatment and allow for adequate follow-up.

CONFLICT OF INTEREST: None

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5. **Ghazala Wahid** – Drafting Manuscript
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