International Journal of Multidisciplinary and Current Research ISSN: 2321-3124
Research Article Available at: http://ijmcr.com

Role of Ultrasound in Finding the Relationship between Placental Location and Fetal Gender

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Accepted 05 March 2016, Available online 10 March 2016, **Vol.4 (March/April 2016 issue)**

Abstract

An analytic, observational study was performed at multi-centers and hospitals in Khartoum state, during the period from (February –July 2014). The aim of the study was to determine the role of ultrasound in relationship between placental location and fetal gender in second and third trimester of pregnancy. The study excluded congenital abnormal uterus, multiple pregnancies in normal uterus and fetal demises, congenital fetal anomalies, technical factors make fetal gender not clear. The study followed international scanning guideline and protocol to localize placenta and to detect fetal gender. The data was collected, classified and analyzed by using SPSS. The analysis of the results found that the most age group in this study 26-35 years with percentage of 64% , most of them have no history of C/S or abnormal placental location. The most placenta were located posterior, most gender determined in this study were males. The study found that there is good relationship between placental location and fetal gender, when the placenta was located posteriorly high proportion were females, and when located anteriorly high proportion was were males. The study recommended more research should be done with increased duration and sample volume for more accurate results.

Keywords: *Placental, Fetal Gender, US.*

1. Introduction

Documentation of fetal gender has medical as well social implications, and the use of ultrasound to evaluate the placenta is routine among the majority of pregnant women. (1)

All studies in this field contribute to advances in knowledge by understanding the history of fetal gender and various location of placenta, adequate visualization of the fetal gender is feasible by high-resolution real-time ultrasonography during the prenatal examination, technical difficulties that were reported relate to fetal presentation, number of fetuses, fetal activity, amniotic fluid volume, and maternal obesity or bowel gas. (2)

The fetal sex can be determined as early as 13 to 14 weeks; most sonographers agree that the sonographic detection rate sharply increases after 18 weeks of gestation. Some reasons of detecting fetal gender are abnormal genitalia in X-linked disorders, testicular feminization, pseudo hermaphroditism, hydrocele.(2) Determination of fetal sex is not only done for parental curiosity but also has many medical advantages. Accurately assessing fetal sex can assist in assigning zygosity in twin pregnancies. Ambiguity of the genitalia can occasionally be detected sonographically after detecting other abnormalities, because of a relevant family history. Some cases are diagnosed after careful evaluation of fetal gender because of an antenatal discrepancy between the fetal karyotype and the genital anatomy. (2)

Up to 11 weeks of gestation the growth and the development of the external genitalia is identical in both sexes. After this there is rapid differentiation of the genital tubercle into the male or the female phallus. As significant differences in the rate of penile and clitoral growth only become evident after 14 weeks, when most of the prenatal growth of the penis occurs, evaluating phallic size before this time will lead to erroneous gender assignment.(2)

Placental locations

Normally, the placenta is located in the fundal area on the left or right lateral side, the posterior or the anterior side or a combination thereof. The most important clinically useful distinction of the location is the relation between the lower portions of the placenta and the internal os of the uterus (2)

Terms such as low-lying placenta, marginal placenta previa, partial and total placenta previa, all refer to an abnormally low placenta. A total placenta previa completely spans across the internal os. [1]

2. Objectives

To determine the role of ultrasound in relationship between placental location and fetal gender in second and third trimester of pregnancy.

3. Material and Methods

Analytical observational study deal with ultrasound findings in pregnant patients, this study was performed in multi-centers and hospitals in Khartoum state, but the most was performed in Alshaikh Fadol teaching hospital, it was carried out from (February –July 2014).

Random sampling technique was performed among 150 women in second and third trimesters of pregnancy with inclusion criteria include; the study cases that were sure of the LMP in second, third trimester with either U/S or clinical evaluation, the study cases had no disease known to affect fetal growth, the study cases of normal uterus with normal singleton pregnancy had been included and the study cases of various location of placenta had been included.

Data collection sheet which was designed to include all variables to satisfy the study and ultrasound examinations

3.1 Technique

Patient Preparation, patient should be full bladder for placental location in Supine position as basic, coupling agent is necessary to ensure good acoustic contact between the transducer and the skin and allow total transmission of the sound beam. [11]

3.1.1 Protocol of scanning

After the patients were informed consent they were scanned by transabdominal approach by routine sonographic evaluation following the scanning protocol and the findings were recorded. Scanning was done in room with dim light to minimize the reflected artifact of the screen, the cases were examined in supine position then applying coupling agent to abdomen and begin evaluation with simple sweep of transducer up and down and side to side across the abdomen to get a rough sense of the uterine contents before focusing on specific areas of interest, after getting a rough sense that the observation were made and the pregnancy was evaluated:

(1) Number of fetuses
(2) Cardiac activity
(3) Placenta location
(4) Assessment of amniotic fluid volume
(5) Determination of GA based on various fetal measurements.
(6) Screening for gross abnormalities.
(7)Finally determine fetal gender. [12]

3.1.2 The protocol to evaluate placental location

For the standard (TAS), the bladder should be adequately distended to optimize visualization of the cervix and lower uterine segment and to show the relationship of the placenta to the internal os. Over distention of the bladder distorts the appearance of the cervix and lower uterine segment and may lead to the false positive diagnosis of placenta previa. [1]

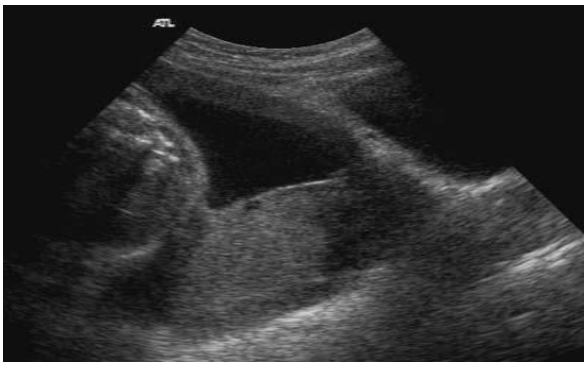

Fig 3.1 identifying the lower segment s posterior placental [5]

Fig 3.2 Demonstrate the lower edge of the anterior placenta [5]

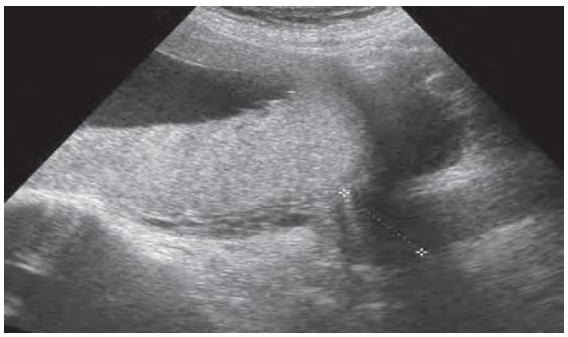

Fig 3.3 complete placenta previa [6]

3.1.3 The criteria to determine fetal gender

The scanner should follow the long axis of the fetus towards the hips; the bladder is helpful land mark within the pelvis by which to identify the anteriorly located genital organs tangential scanning planes direct between the thighs. Transverse plane used to see the female genital organs, the labia is identified ventral to the bladder, where tangential projection is the entire labial folds, and often the labia minora, are demonstrated. In scans of perineum obtained parallel to the femurs the shape of the genitialia appears rhomboid, the labia appear edematous and swollen. The male genitalia use either longitudinal or transverse plane, the scrotal sac is seen as mass of soft tissue between the hips with the scrotal septum and testicles, and fluid around the testicle (hydroceles) is common benign findings during intra uterine life.[2] Areal time system with 3.5 MHz, TA, convex transducer (SonoScape C352 made in China, MINDARY4900, MEDISON -SONOACE X4 made in Korea). Recording system by Sony ultrasound printer up-860. The data had been analyzed by using the Statistical Package for Social Sciences {SPSS}.

4. Results and Discussion

Patient having history of cesarean section in same time having history of abnormal placental location showed that, those have no history of abnormal placental location have no history of cesarean section (93%), it means that no relation between cesarean section and abnormal placental location.

The gestational age was analyzed in to four groups, the most age group proportion (40%) were (31-35) weeks, in this age the accuracy to detect fetal gender is high and this agree with Rana A, she found that good opinion about the site of placenta to be posterior in male while anterior in female. [8]

This study was disagree with Ramsi method, the range of group were 6wks and (18-20) weeks, because the focused on the early pregnancy for early prediction. [2]

According to placenta location, it was analyzed in to six groups' anterior, posterior, fundal anterior, fundal posterior, low lying and previa. The most groups were posterior and anterior placenta, no case of placenta previa or low lying, for simplified we added the number of cases of fundal anterior to anterior placenta and fundal posterior to posterior placenta. The most common group was posterior placenta, because the normal implantation sites in uterine wall is superior and posterior, this is matches with study done in done London which shows that the accuracy of sex determination increased with gestation from 70.3% at 11weeks to 98.7% at 12weeks and 100% at 13weeks. It is also agree with Rana A, she found that there is higher percentage of placental site to be fundal or previa in females more than male. [7-8]

Regarding fetal gender, this analyzed in to two groups male and female, the most gender group was male 96 cases (64%), because male fetus is always easy to detect by ultrasound than female. This agrees with all studies. [2-7-8]

According to the relationship between placental location and fetal gender, the result of 150 fetuses, 96 were male and 54 were female. Placental location assessment showed that the placenta was located posteriorly in 91 cases (57%) and 59 of cases (43%) was located anteriorly.

When the placenta was located posteriorly (66%) were females, 57% were male (the high proportion were females), and when the placenta was located anteriorly (43%) of these were male and 34% were female (the high proportion were males) analysis confirmed good correlation of placental location with fetal gender.

The result of chi-squire test shown significant difference (p=0.119) between placental location and fetal gender.

This result was disagreeing with fourth study, which showed that site of placenta was posterior in males while anterior in females. [8]

Table 4.1 Placenta location based on GA

Placenta location	GA (16-20)	GA (21-25)	GA (26-30)	GA (31-35)	GA (36-40)
Anterior	20%	33%	41%	43%	33%
Posterior	80%	66%	44%	50%	45%
Fu/anterior	0%	1%	11%	0%	0%
Fu/posterior	0%	0%	4%	7%	22%
Lowlying	0%	0%	0%	0%	0%
Previa	0%	0%	0%	0%	0%

Table 4.2 Frequency & proportion of placenta location vs. fetal gender

Placenta location	Frequency (male)	Frequency (female)	Male %	Female %
Anterior	41	18	43	34
Posterior	55	36	57	66
Total	150		100%	100%

Conclusion

Determine the fetal gender and localize placental location by sonography is consider to be accurate in the second and third trimester**.** Male fetus is always easy to detect by ultrasound than female. Anterior placenta is more with male fetus, while posterior placenta is more with female fetus.

Fig.5.1 sonogram of male fetus and posterior placenta at 33wks

Fig 5.2 Sonogram of male fetus and anterior placenta at 29wks

Fig.5.3 Sonogram of female fetus and posterior placenta at 29wks

Fig.5.4 Sonogram of male fetus and posterior placenta at 35wks

This study is not an alternative to the conventional views to predict fetal gender, but rather as a complimentary approach that can be easily learned and applied; this study might be used as an additional sonographic soft marker because of good correlation of placental site and fetal gender.

Recommendations

Double check for fetal gender to avoid wrong prediction, keep in mind that we are doing a research to help scientists, physicians, and not finding the fetal gender only. Use minimum scanning time possible to minimize patient discomfort and to reduce U/S exposure (ALARA principle). International guide lines protocol should be followed to localize placental location and to detect fetal gender. More research studies should be done with expanding period of time and include more sample data for more precise and accurate results.

References

[1]. Carol M. Rumack, Stephanie R. Wilson, J.William Charbonneau, Deborah Levine. Diagnostic ultrasound. 4th ed. Mosby; Philadelphia: 2011.p1502-1504, 1381-1382
[2]. http://hcp.obgyn/org.net/articles//relationship-between –placental location–and-fetal-gender-ramzis-method accessed at 4:47pm, January 22 2014.
[3]. P.E.S. Palmer. Manual of Diagnostic Ultrasound. First ed. world health organization; Geneva: 1995 chapter 17, p259.
[4]. Philip N. Baker. Obstetrics by ten teachers. ELBS. 6th ed. Elsevier; London: 2003. Chapter one.
[5]. Basky Thillanyanathan, Obstetric ultrasound How why and when. 3rd ed. Elsevier; London: 2004. p136.
[6]. Asim Kurjak, Frank A Chervenak. Donald School Textbook of Ultrasound in Obstetrics and Gynecology.3rded. Jaypee Brothers Medical Publishers (P) LTD; New Delhi: 2011.
[7]. http://hcp.fertilitycenter.org/vitro-fertlization-ivf/2020212862-how-find-placenta-location-gender-determination.html pg3 accessed at 12:14am, may 24 2014.
[8]. Medical Journal of Tikrit; umbilical artery blood flow and site of placenta and fetal gender; Rana, Samira, Abdullah; 2010, www.tu.edu.iq/index.php/TMJaccessedat10:24am,aug132014.
[9]. Juriy Wladimiroof, SturlaElk-Nes. European Practice in Gynecology and obstetrics. First ed. Elsevier; Philadelphia: 2009 p115-119.
[10]. Asim Kurjak, Frank A Chervenak. Donald School Textbook of Ultrasound in Obstetrics and Gynecology.3rded. Jaypee Brothers Medical Publishers (P) LTD; New Delhi: 2011.
[11]. Lucy Chie, Deborah Levine. Ultrasound Clinics. First ed. Elsevier; Philadelphia: 2006 p312.
[12]. Asim Kurjak, Frank A Chervenak. Donald School Textbook of Ultrasound in Obstetrics and Gynecology.2nd ed. Jaypee Brothers Medical Publishers (P) LTD; New Delhi: 2006.p300