First Trimester Pregnancy Complications how could be Evaluated

Dr. M Ayub Hussain MBBS (MD), DTM&H, RDMS, RVT*

Program Director, Diagnostic Medical Sonography, New York Career Training Center, New York, USA

*Corresponding Author: M Ayub Hussain, Program Director, Diagnostic Medical Sonography, New York Career Training Center, New York, USA.

Received: April 18, 2018; Published: June 01, 2018

Abstract

First trimester pregnancy is an important and critical stage. The fetus is developing at a fast rate that any disturbance may affect his growth to develop completely till the end of the pregnancy. First trimester ultrasound is not recommended because of biological effect but it's the best, safest and fastest modality that can be used to diagnosed any complication. Most congenital abnormalities can be seen sonographically in the first trimester which helps parents to decide on a safe determination based on the state law. Early diagnosis can help reduced any related complications as well. Ultrasound is the best modality to evaluate the 1st trimester pregnancy complications specially when is done with the Trans-vaginal transducer.

Keywords: First Trimester Pregnancy; Ultrasound; Sonography

Introduction

Pregnancy lasts about 40 weeks. It is broken into 3 trimesters or stages of fetal development. The first trimester pregnancy is from conception until 12 weeks of gestation. The first trimester is an important stage due to the baby is developing at an amazing sonographic milestone. The first eight weeks is known as embryo and it is the time during the organogenesis takes place. Any disturbance during this time can cause complications. Ultrasound is not encouraged in the first 13 weeks of pregnancy in the United States unless medical indicated. Also, fewer ultrasounds fewer are the risk of potential biological effect.

The following are the First trimester complications

The most common type of 1st trimester complication is spontaneous abortion which can be inevitable, partial or complete. Spontaneous abortion is known as miscarriage. It’s the natural death (not induced) of an embryo or fetus before it is able to survive independently. It takes place usually before 13th week of pregnancy. It occur incidental/accidental. Inevitable abortion is a low-lying sac; a fetal pole with a heartbeat and open cervical Os. Cervical incompetence is the condition of an open internal and or/external Os. Partial abortion is also known as retained product of conception. Sonographically, No fetal pole seen in uterine cavity, Irregular shaped gestational sac, and Product of conception in the uterine cavity. The 95% cases, the retained product will be expelled naturally unless therapeutic DMC is needed. Complete abortion is Heavy bleeding, No evidence of an IUP and Uterine cavity, may contain blood or seen as empty with a line of endometrial tissue. Last, Missed abortion sonographically, there is a fetal pole with absent heart motion within a gestational sac. The fetus usually dies couple of weeks before. MSD does not correlate with the CRL. The fetus is usually aborted spontaneously. All of the above types of spontaneous abortions have signs and symptoms just like vaginal bleeding, Low B-hCG and severe cramping. Ultrasound’s
role is to assess viability of the pregnancy and evaluate for a uniform gestational sac and closed internal Os. Sub-chorionic hemorrhage is another complication in which prognosis depends on severity of the bleeding which occurs behind chorionic tissue (embryonic tissue) [1]. Ectopic pregnancy is a high risk situation in pregnancy because it can rupture. Ectopic pregnancy is when the blastocyst implants outside the endometrial cavity. There is a higher chance in women that have had PID (Pelvic inflammatory disease) or Previous ectopic pregnancy. Ectopic pregnancy can occur in different locations for example: In the Fallopian tube: 92 - 95% of all ectopic implantations occur in the ampulla and isthmus portions of the Fallopian Tube. Cornual: 2.5% of all ectopic implantations. If the Intrauterine pregnancy is high in the uterine fundus or a measurement of less 5mm it is to be considering a cornual ectopic pregnancy. This is the most dangerous site. Ovarian and cervical: 1 - 3% chance to occur. The cervical ectopic will have a well-defined gestational sac. Last, it can occur in the abdomen, 0.03% of all ectopic implantations occurs in the abdomen. Early diagnosis important due to placental separation from bowel or peritoneum. After 25 weeks, difficult to diagnose due to enlargement of uterus. Ectopic pregnancy can happen anywhere where the blastocyst implants outside the uterine cavity [2]. It is important to pay attention to the signs and symptoms in the first trimester because ectopic pregnancy can rupture. Amenorrhea, Positive pregnancy test, Low quantitative beta-hCG than used to be, vaginal spotting/bleeding and Adnexal tenderness/palpable mass in P/V examination are symptoms before it ruptures. After the rupture, At first Sharp pain in the pelvic area follow by a little or no pain, Increased WBC, Blood in the cul de sac and Fever. The sonographic protocol for suspected ruptured of ectopic pregnancy most important is to locate a viable intrauterine pregnancy. Then, Patient bladder should be filled by a foley catheter and Obtain results of pregnancy test. If a viable IUP is not demonstrated in trans abdominal sonographic (TAS) then trans vaginal probe must be used. Look for Complex adnexal mass and pelvic fluid especially in posterior cul de sac. Also, there could be fluid in the Morrison pouch especially in abdominal pregnancy. Ectopic pregnancy is confirmed with fetal heart motion outside uterine cavity especially in adnexa with 2D gray scale/Doppler. As well, Pseudogestational sac in the endometrial cavity. Co- existing of ectopic pregnancy and a true IUP can be seen 1 in 30,000 pregnancies.

Figure 1: Types of spontaneous abortion [3].
First Trimester Pregnancy Complications how could be Evaluated

Figure 2: Tnevitable Abortion [4].

Figure 3: Partial Abortion [5].

Citation: M Ayub Hussain. “First Trimester Pregnancy Complications how could be Evaluated”. EC Gynaecology 7.6 (2018): 241-256.
Figure 4: Color Doppler of retain product of conception [6].

Figure 5: Complete abortion [1].
**Figure 6:** Complete abortion [7].

**Figure 7:** Color Doppler of missed Abortion.
First Trimester Pregnancy Complications how could be Evaluated

Figure 8: Subchorionic hemorrhage [5].

Figure 9: True IUP pregnancy [5].

Citation: M Ayub Hussain. "First Trimester Pregnancy Complications how could be Evaluated". EC Gynaecology 7.6 (2018): 241-256.
First Trimester Pregnancy Complications how could be Evaluated

**Figure 10:** Ectopic pregnancy in adnexa [8].

**Figure 11:** Interstitial ectopic pregnancy [9].
First Trimester Pregnancy Complications how could be Evaluated

\[\text{Figure 12: Cornual ectopic pregnancy [10].}\]

\[\text{Figure 13: Ectopic pregnancy in ovary [9].}\]

\textit{Citation:} M Ayub Hussain. “First Trimester Pregnancy Complications how could be Evaluated”. \textit{EC Gynaecology} 7.6 (2018): 241-256.
First Trimester Pregnancy Complications how could be Evaluated

**Figure 14**: Ectopic pregnancy in FT [11].

**Figure 15**: Cervical ectopic pregnancy [12].

_Citation_: M Ayub Hussain. “First Trimester Pregnancy Complications how could be Evaluated”. *EC Gynaecology* 7.6 (2018): 241-256.
Gestational Trophoblastic Disease is another type of complication that can occur in the first trimester of pregnancy. There are different types of GTD which can be Partial and complete, Chorioadenoma/invasive, Choriocarcinoma, co-existing fetus, mole or Placenta site- trophoblastic tumor [14]. The cause of this disease is the fertilization of genetically defective ovum (empty) by one or two sperm as well, a normal ovum with two sperms. This is a group of benign and malignant pathologies of trophoblast (which derives from the chorion and amnion). Hydatidiform mole occurs in one of every 1000 to 2000 pregnancies in the US and Europe. The highest incidence occurs in the far eastern countries especially in Japan, Taiwan, and Indonesia. Partial hydatidiform mole is when two sperms fertilized with a normal egg, 69 chromosomes and Coexisting fetal parts along with hydatidiform mole. Complete hydatidiform mole is the most common when there is Empty ovum, absence of fetus and absence of amnion [15]. The sonographic appearance of hydatidiform mole is variable. In the first trimester is seen as blighted ovum, missed abortion, degenerating leiomyoma or hydropic placenta. After first trimester: large soft tissue mass of low to moderate amplitude echoes filling the uterine cavity and containing fluid-filled spaces looking like honeycomb appearance. Sonographically: Small, echogenic mass filling the uterine cavity. In Doppler: hyper Vascularity, also may have partial fetal parts. Chorioadenoma Destruens is Invasive, Malignant locally, Non-metastatic and hCG levels lower than Hydatidiform mole. Sonographically, Irregular borders and Enlarge uterus with foci of increased echogenicity and cystic spaces in the myometrium. Choriocarcinoma is the most malignant in nature. There is usually a Distal Metastatic and Hemorrhagic necrosis in the myometrium. Sonographically, Cystic to solid areas of necrosis, Coagulated blood, Tumor tissue invading and extending as a mass outside uterine wall can be seen in choriocarcinoma. Last, Metastatic lesions located in the liver and lungs. Fetus and coexisting mole arises from transformation of the trophoblast one of two dizygotic twin placentas. Ultrasound examination may suggest the diagnosis by demonstrating a separated fetus adjacent to a trophoblastic process or changes. Sonographically, we can see Concurrent presence of normal appearing placenta with the fetus and in a separate area of cystic vesicular appearance. Placental- Site Trophoblastic Tumor Originate from intermediate cytotrophoblast cells along with blood vessels and syncytiotrophoblast cells. It may secrete human placenta lactogen .It can occur after a normal pregnancy, abortion, term delivery, ectopic pregnancy or molar pregnancy. Invades the lymphatic vessels system and PSTT is characterized by low beta-hCG levels because it is a neoplastic proliferation of intermediate trophoblastic cells [16].
**Figure 17:** Formation of placenta.

**Figure 18:** Types of Molar pregnancy [13].

*Citation:* M Ayub Hussain. “First Trimester Pregnancy Complications how could be Evaluated”. *EC Gynaecology* 7.6 (2018): 241-256.
First Trimester Pregnancy Complications how could be Evaluated

Trophoblastic Tumor

Doppler in GTD

Pregnancy lasts about 40 weeks. It is broken into 3 trimesters or stages of fetal development. The first trimester pregnancy is from conception until 12 weeks of gestation. The first trimester is an important stage due to the baby is developing at an amazing sonographic milestone. The first eight weeks is known as embryo and it is the time during the organogenesis takes place. Any disturbance during this time can cause complications. Ultrasound is not encouraged in the first 13 weeks of pregnancy in the United States unless medical indicated. Also, fewer ultrasounds fewer are the risk of potential biological effect.

Management and treatment for GTD

Pregnancy lasts about 40 weeks. It is broken into 3 trimesters or stages of fetal development. The first trimester pregnancy is from conception until 12 weeks of gestation. The first trimester is an important stage due to the baby is developing at an amazing sonographic milestone. The first eight weeks is known as embryo and it is the time during the organogenesis takes place. Any disturbance during this time can cause complications. Ultrasound is not encouraged in the first 13 weeks of pregnancy in the United States unless medical indicated. Also, fewer ultrasounds fewer are the risk of potential biological effect.

Figure 19: Molar Pregnancy [13].
Figure 20: Hydatidiform mole [17].

Figure 21: GTD in Doppler [18].
First Trimester Pregnancy Complications how could be Evaluated

Figure 22: Fetus and co-existing mole [19].

Figure 23: Complete invasive.
Conclusion

Ultrasound is the best modality to evaluate the 1st trimester pregnancy complications especially when is done with the Trans vaginal transducer. Earliest detection of above complications can determine the prognosis of the pregnancy and makes it easier and safest termination if needed [21-27].

Acknowledgement

Karen Soto, DMS program full-time Student, New York Medical Career Training center Institutional staffs of New York Medical Career Training Center.

Bibliography

4. Verena T Valley. Sonographic Inevitable Abortion, 7ADAD.
7. “Complete Abortion“.
8. Gynaecology | 3.2 Adnexa Case 3.2.5 Ectopic Pregnancy". Gynaecology | 3.2 Adnexa : Case 3.2.5 Ectopic Pregnancy | Ultrasound Cases.
First Trimester Pregnancy Complications how could be Evaluated

11. Abnormal Development - Ectopic Implantation.
19. Ultrasound Pictures.
23. Should I Be Worried That I Was Diagnosed with Subchorionic Hemorrhage?" BabyQ.
27. Gestational Trophoblastic Disease.

Volume 7 Issue 6 June 2018
©All rights reserved by M Ayub Hussain.

Citation: M Ayub Hussain. “First Trimester Pregnancy Complications how could be Evaluated”. EC Gynaecology 7.6 (2018): 241-256.