



“A STUDY OF DIAGNOSIS OF EARLY UNRUPTURED TUBAL PREGNANCY BY ULTRA SONOGRAPHY”

Obstetrics & Gynaecology

**Dr. Nagesh Kumar
Ramchandram
Galipelli***

MS OBGY, DNB OBGY, Lokmanya Tilak Municipal Medical College And General Hospital (ITMMC & GH), Sion, Mumbai. *Corresponding Author

**Dr. Durgeshwari
Mohan Chintalwar**

MS OBGY, Lokmanya Tilak Municipal Medical College And General Hospital (ITMMC & GH), Sion, Mumbai.

ABSTRACT

To study the ultrasonographic characteristics and diagnostic approaches of unruptured tubal pregnancy (UTP).

Materials and methods: This study was done in the department of OBGY in a tertiary care hospital in India with the use of a USG machine. One hundred cases of early tubal pregnancy, which were confirmed surgically, were analyzed.

Results: Among 55 cases of UTP, 50 were diagnosed by ultrasonography and 5 cases were missed by ultrasonography. The embryo sac type was found in 40.00%, while the heterogeneous mass type was found in 60.00% of patients. The maximum length and diameter of the ectopic pregnancy mass ranged from 12 to 66 mm (mean size, 25.32 ± 10.35 mm).

Conclusion: A paraovarian mass, thickened fallopian tube, uterine endometrium with a thickness of ≤ 10 mm, and high echo are important indicators of early UTP.

KEYWORDS

Ultrasonographic diagnosis, unruptured tubal pregnancy

INTRODUCTION:

Ectopic pregnancy is a common diagnosis in the gynecological emergency. The process of pregnancy starts with fertilisation of the egg after which it gets implanted into the inner lining of the uterus. The uterus is specially designed for implantation, nourishment of the fetus and its well being. In some cases, if the fertilised egg gets implanted anywhere else except the uterus, such pregnancy is called as ectopic pregnancy. Most common sites include fallopian tube called as tubal pregnancy, ovary or lower cervix, abdomen etc. as such parts are not designed for pregnancy, the pregnancy is not viable there and the female presents with distress. There may be severe bleeding, abdominal pain, shoulder pain etc. the urine pregnancy test will be positive but the USG will show empty uterus. Such a condition is mostly caused by previous ectopics, history of use of IUCD, infections etc.

To date, there is no gold standard non-invasive technique for diagnosing ectopic pregnancy. (1) If an ectopic pregnancy cannot be detected early and accurately, timely diagnosis and treatment are not provided. This can lead to rupture hemorrhage, shock, and even become life-threatening. (2,3) Therefore, early unruptured tubal pregnancy (UTP) should be highly considered when a pregnancy test in blood or urine of the patient is positive and no pregnancy is found *in utero*. This study aimed to study the ultrasonographic characteristics and diagnostic approaches of UTP.

METHODOLOGY

This study was done in the department of OBGY in a tertiary care hospital in India with the use of a USG machine. Written informed consent was obtained from the participants.

Patients who had a tubal pregnancy from November 2020 to June 2021 were included. The types of unruptured pregnancy were confirmed by an operation in our hospital.

The bladder was properly filled during abdominal ultrasonography. When transvaginal ultrasonography was performed, the bladder was emptied and the lithotomy position was used. The vaginal probe was coated with a coupling agent, covered with a condom, and slowly placed into the posterior fornix of the vagina. Finally, the probe was inserted into the uterine cavity with or without a pregnancy sac or false pregnancy sac. The state of the bilateral accessory area was defined as no mass, the fallopian tube had no thickening, there was a relationship between the mass and fallopian tube, and the mass showed blood flow. In the endometrium, a real pregnant sac was determined if there was a “double ring sign” and the neck tube was not connected.

When there was no clear pregnancy sound image in the uterine cavity,

the direction of the probe was adjusted to scan the transverse plane, and the sound image was set to the maximum diameter line of the transverse plane of the uterine fundus.

RESULTS:

The age of the patients ranged from 20 to 46 years old, with a mean (standard deviation) age of 28.32 ± 5.35 years.

In the present study, among 55 cases of UTP, 50 were diagnosed by ultrasound and the diagnostic coincidence rate was 90.9%. Furthermore, there were 5 cases of missed diagnosis by ultrasonography and the missed diagnostic rate was 9.1%. The maximum length and diameter of the ectopic pregnancy mass ranged from 12 to 66 mm (mean size, 25.32 ± 10.35 mm).

According to the echo characteristics of the ectopic pregnancy mass, blood flow was distributed around the mass and the relationship of the mass with the ipsilateral ovaries was examined (Table 1).

Tables:

Table 1 showing the analysis of ultrasonographic features of the ectopic pregnancy mass.

Audiovisual characteristics	Classification	Number of cases (%)
Echo characteristics	Embryo sac type	20 (40.00)
	Heterogeneous mass type	30 (60.00)
Blood flow signal	No flow	35 (70)
	Dotted	6 (12)
	Stripe	7 (14)
	Half ring	1 (2)
	Ring	1 (2)
Relationship with the ipsilateral ovary	Clear boundary	39 (78)
	No clear boundary	11 (22)
Accumulation of fluid in the pelvic cavity	Yes	30 (60)
	No	20 (40)

23 (46%) patients had ipsilateral tubal thickening and 26 (50%) had no tubal thickening. We measured the thickness of the endometrium and the echo characteristics (Table 2). Most patients had an intimal thickness ≤ 10 mm and a high echo.

Table 2 showing the frequency distribution on which surgeon would you expect to treat the following conditions (n=100)

Audiovisual characteristics	Classification	Number of cases (%)
Intimal thickness	≤ 10 mm	34 (68)
	> 10 mm	13 (26)

Echo characteristics	Low echo	2 (4)
	Medium echo	8 (16)
	High echo	36 (72)
Three-line sign	Yes	14 (28)
	No	36 (72)
False pregnancy sac	Yes	3 (6)
	No	47 (93)

DISCUSSION:

Ectopic pregnancy is a very common gynaecological emergency and accounts for 2% of pregnancies. (4,5) Among these pregnancies, tubal pregnancy is the one of most common types. (6-8) Occurrence of a tubal pregnancy is often misdiagnosed because it is located deeply in the pelvic cavity. Rupture often occurs during tubal pregnancy in patients with internal bleeding, which can lead to a state of shock. When rupture is severe, it can lead to death of patients. (9) Transvaginal ultrasonography has good accuracy in the diagnosis of early pregnancy. (10) Therefore, this technique is considered as the first choice of a non-invasive examination.

In this study, we applied the ultrasonographic method to diagnose UTP. We investigated the clinical characteristics of ultrasonographic diagnosis for an ectopic tubal pregnancy. We found that tubal pregnancy occurred in the ampullary tubal area in 44 (88%) patients. A total of 48% of patients had ipsilateral tubal thickening. Ipsilateral fallopian tubes were often accompanied by varying degrees of changes in thickening.

The intima in most patients (72%) was hyperechoic. The critical value of the thickness of the intima was 10 mm. An intima with a thickness of ≤ 10 mm was found in 68% of patients, while an intima with a thickness of >10 mm was found in 26% of patients. Other authors have suggested that 9.8 mm could be used as the threshold of endometrial thickness to distinguish ectopic pregnancy from functional pregnancy. (11) Furthermore, the endometrium is significantly thinner in an ectopic pregnancy than in an intrauterine pregnancy. (12)

Characteristic fallopian tube rings are often present during early tubal pregnancy. (13) This condition is due to thickening of the fallopian tube wall by edema, and formation of pregnancy tissue and blood clots in the tube cavity together. Fallopian tube rings are located in the fallopian tube area, with 10 to 30 mm in diameter and a ring wall of 5 to 10 mm and high echogenicity. The center of the ring is anechoic (regular or irregular pregnancy sac), and a few fallopian tube rings are observed with the embryo and cardiac beat, which is also known as "bagel sign". (14)

In the present study, 5 cases of ectopic pregnancy mass were not detected by ultrasound, with a missed diagnostic rate of 10%. Among these cases, 2 cases were located in the ampulla, two were in the isthmus, and one in the interstitium. Furthermore, among these patients, the operative time and ultrasonic examination time of five patients were longer than 4 days. Regardless of whether the follow-up time was too long, further analysis is required with a larger sample size. During the process of the examination, the scope of scanning should be expanded as far as possible to reduce a missed diagnosis. Three cases were misdiagnosed by transabdominal ultrasonography, which may have been due to interference by peritoneal gas and the patient's obesity during transabdominal ultrasonography, or due to the ectopic pregnancy mass, which was small and could not be detected during transabdominal ultrasonography. (15) If ectopic pregnancy is suspected in the clinic, transvaginal ultrasonography should be performed.

There are some limitations to our study, such as the lack of grouping of patients and statistical analysis. Therefore, more prospective studies are required to confirm our findings.

CONCLUSION

Our study concluded that USG diagnosis of ectopic pregnancy should be learned and properly done to prevent further complications and that paraovarian mass, thickened fallopian tube, uterine endometrium with a thickness of ≤ 10 mm, and high echo may be important indicators of early UTP.

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