

Ruptured Ectopic Pregnancy, the Challenges for the Obstetrician: Single Center Prospective Study

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ABSTRACT

Introduction: Ruptured ectopic pregnancy is a life threatening obstetrical emergency and presents in various ways. The aim was to evaluate predisposing factors associated with development of ectopic pregnancy in current scenario and evaluation done for association between ectopic pregnancy and constellation of signs/ symptoms.

Material and Methods: A prospective study conducted between Jan 2017 to April 2018 at a tertiary center for women attending emergency department presenting to our center with complains of missed period or scanty periods with abdomen pain were included. Women with abdominal pain and non suspicious of ectopic pregnancy and medically planned cases of ectopic pregnancy were excluded.

Results: The prevalence of ruptured ectopic pregnancy in present study was 1.84% amongst all antenatal cases entering to the hospital. The predominant complain was abdominal pain(95.45%), missed periods (77.27%) and vomiting (50%). The positive past history of use of emergency pill (36.36%) and unsupervised medical abortion pill (27.27%), tubal surgery (22.73%) and PID (50%) were associated factors. The serum β hCG was significantly associated in rupture EP. The abdominal tenderness and hemoperitonuem was found strongly associated. The morbidity assessed by high blood transfusion rate (86.36%).The commonest site of rupture was ampulla 68.18% of fallopian tube.

Conclusion: The ruptured ectopic pregnancy is a life threatening emergency obstetrical condition a. The unsupervised usage of abortifacient along with atypical clinical history have increased diagnostic dilemma in ectopic pregnancy therefore Early diagnosis and treatment of ectopic pregnancy are the only modality available to prevent tubal ruptured and its associated morbidity.

Keywords: Ampulla, β hCG, Ectopic Pregnancy, Medical Abortifacient Trans Vaginal Ultrasonography, Emergency Pill, LNG Pill, PID, Shock, Salpingectomy, Hemoperitonuem, Laparotomy

pregnancy presenting to an emergency department, the condition is not identified at the initial medical assessment.⁵

In view of challenging diagnosis the aim of the current study is to evaluate the various risk factors associated in the cases of ruptured ectopic and to study the association of factors amongst them.

MATERIAL AND METHODS

A prospective study conducted for the period of Jan 2017 to April 2018 at tertiary care center for the women attending emergency department.

The women presenting to our center with complains of missed period or scanty periods with abdomen pain were included.

The exclusion criteria were all women with diagnosis of lower abdominal pain but non suspicious of EP and medically planned cases of EP.

The detail history, clinical findings, Ultrasonography findings, intra operative findings and post operative recovery details for all study population taken and entered in excel sheet.

There were 1180 overall new pregnancy with missed periods with pain in abdomen and 723 acute abdomen(pregnancy/ missed period, not sure) cases registered to the center. Among all only those who were fitting into the inclusion criteria, underwent laparotomy and diagnosed intra operative as ruptured ectopic taken for the study.A total of 22 cases diagnosed with rupture ectopic .

All data was collected in Microsoft excel sheet. All the data is expressed in mean \pm standard deviation. Distribution is expressed as a percentage of total number in population in actual numbers. The categorical distribution calculated by chi square test . The statistical analysis was done using statistical package for social sciences (SPSS) Version 17.0 IBM Computers New York and Excel.

INTRODUCTION

An ectopic pregnancy occurs when a fertilized ovum implants outside the normal uterine cavity.^{1,2} The incidence of ectopic pregnancy in the general population is about 2%.³ It is a common cause of morbidity and occasionally of mortality in women of reproductive age. A prospective case-controlled study has shown that increased awareness of ectopic pregnancy and a knowledge of the associated risk factors helps identify women at higher risk in order to facilitate early and more accurate diagnosis.⁴ Despite the relatively high frequency of this serious condition, early detection can be challenging. In up to half of all women with ectopic

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How to cite this article: Kaveri Shaw Patel, Roma Sonkar Nag, Lovely Jain. Ruptured ectopic pregnancy, the challenges for the obstetrician: single center prospective study. International Journal of Contemporary Medical Research 2018;5(5):E1-E5.

DOI: <http://dx.doi.org/10.21276/ijcmr.2018.5.5.20>

RESULTS

There were 22 patients enrolled in the study who were fulfilling the criteria for the duration of Jan 2017 to Apr 2018. The incidence of the disease was 1.84% (22/1180) of overall pregnancy enrolled and 3.04% (22/723) of overall cases of acute abdomen attended the emergency department.(table 1)

| Demographic factors | Numbers | % |
|---------------------|---------|-------|
| primigravida | 7/22 | 31.82 |
| multipara | 15/22 | 68.18 |
| H/O previous EP | 3/22 | 13.63 |
| IVF | 1/22 | 4.55 |

Table-1: Distribution of associated demographic factors

| Age group distribution | Numbers | % |
|------------------------|---------|-------|
| <20 yrs | 0 | 0 |
| 20-25 yrs | 6 | 27.27 |
| 26-30 yrs | 7 | 31.82 |
| 31-35 yrs | 8 | 36.36 |
| >35 yrs | 0 | 0 |

Table-2: Age wise distribution of the cases

| Variables | Number | % |
|--|--------|--------|
| MA | 6 | 27.27% |
| Use of emergency contraceptive pills (LNG) | 8 | 36.36% |
| previous tubal surgery | 5 | 22.73% |
| PID | 11 | 50.00% |
| No risk factor | 3 | 13.64% |

Table-3: The associated risk factor distribution

| Correlation in GA and β -hCG | 5 week | <6 week |
|------------------------------------|------------------|-----------------|
| <1500 | 13 (10.91) [0.4] | 2 (4.09) [1.07] |
| >1500 | 3 (5.09) [0.86] | 4 (1.91) [2.29] |

Table-4: Correlation in GA and β -hCG

| Hemoperitonuem | Cases | Percent |
|-----------------|-------|---------|
| 1000 ML or less | 8 | 36.36% |
| 101-500ML | 11 | 50% |
| <100ML | 3 | 13.63% |

Table-5: TVS finding of hemoperitoeum

| Procedure | No. cases | Percentage |
|-----------------------------------|-----------|------------|
| Salpingectomy± oophorectomy | 19 | 86.36% |
| segmentectomy | 2 | 9.09% |
| segmentectomy with recanalization | 1 | 4.55% |

Table-6: Procedures on ruptured EP

| | Rashmi A Gaddagi et al | Rose et al. (2002) | Bondada et al | Present study |
|---------|------------------------|--------------------|---------------|---------------|
| Ampulla | 70.3% | 83.9% | 40% | 68.18% |
| Isthmus | 3.0% | 39.78% | 22.20% | 27.27% |
| Ovarian | - | 1.07% | 4.40% | 4.54% |

Table-7: Comparison of the anatomical site of the ectopic pregnancies

| | Bondada et al | Present study |
|--|---------------|---------------|
| Unilateral salpingectomy | 53.30% | 86.36% |
| Salpingo-oophorectomy | 11.10% | 9.09% |
| Unilateral salpingectomy with contra-lateral tubectomy | 15.50% | |
| Segmentectomy with recanalization | - | 4.55% |
| Segmentectomy | | 4.55% |

Table-8: Type of Surgical Procedures Performed

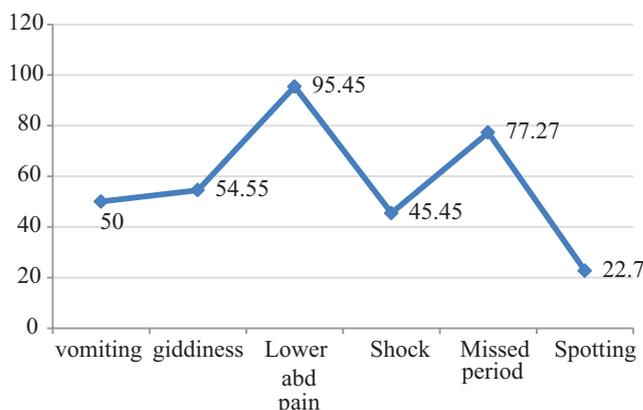


Figure-1: Distribution of clinical presentation



Legend-1: Intraoperative photograph of Ruptured Ampulla of fallopian tube; **Legend-2:** specimen of ruptured ovarian ectopic pregnancy

The majority of ruptured EP (68.18%) were multiparous. The commonest age group presented with ruptured EP was 31-35 year (36.36%) (table2). In 95.45% of cases the presentation was pain in lower abdomen and 45.5% of cases were received in condition of shock. Vomiting was associated in 50% of cases; giddiness was there in 54.55% amenorrhea 77.27%and in 45.55% of cases bleeding per vaginum was present (figure 1).

The etiological /risk factors associated in the present population were PID in half of the cases. The second most common associated factor (36.36%) was the use of emergency contraception pill containing Levonorgestrol. In 13.64% no risk factor was found. The other factors were use of medical abortifacient 27.27% and history of tubal surgery 22.73% and history of d&c 18.18% while in 36.36% of cases there were multiple risk factors involved (Table-3). The urinary

pregnancy test was found positive in 90.9% (20/22) cases while culdocentesis was positive only in 31.8% (7/22) of the cases. On per abdominal examination unilateral tenderness was more frequently encountered (68.18%), while on per vaginal examination Tenderness on cervical movement was present in 31.81% of the cases and masses in the fornices were present in 50% of the cases.

Severe anemia was present in 50% cases on admission and 81.81% required blood transfusion. The chi-square statistic found a significant correlation ($p < 0.05$) between in Gestational age (GA) and β -hCG, The Higher the β -hCG in early GA the more probability of rupture of EP (Table-4). The significant hemoperitonuem 1 liter and more was seen in 36.36% ruptured ectopic cases. The majority of population (50%) had blood loss of 100-500 ml on admission while 13.6% had less than 100 ml collection ultrasonographically and intra operative. (TABLE-5). The chi square test for association of hemoperitonuem and tenderness was found significant ($p < 0.05$). The results reflects that the more the hemoperitoneum higher the tenderness in abdomen and cervical motion. The intra op laparotomy finding were suggestive of ruptured tubal ectopic in 90.9% cases while tubal abortion in 2 cases

The majority of ectopic site was Right side tubal ectopic (50%) with ampulla in 68.18% (15/22) cases. In laparotomy the most common procedure carried out was salpingectomy \pm oophorectomy 86.36%, only segmentectomy 9.09% and segmentectomy with recanalization in single case (Table-6). Almost 86.36% cases required blood transfusion of 2 to 3 unit.

DISCUSSION

In various studies ectopic pregnancy rates range from 0.8% to 2% of all reported pregnancies; in our study the rate of ectopic is 1.84% (overall antenatal booked) to 3.04% (overall acute abdomen) comparable to previous studies.^{6,7}

Clinical symptoms

The presentation of extra uterine pregnancy is highly variable, ranging from an asymptomatic state, to pelvic pain that is worse on one side, to tubal ruptured with hemorrhagic shock.⁸

There were 95.45% presented with complain of lower abdomen pain, 45.5% were received in shock and the rest had complain of vomiting (50%), giddiness (54.55%) and bleeding per vaginum (45.55%). The most common presenting symptom was abdominal pain in 37 (97.3%) patients whereas history of amenorrhea and vaginal bleeding were found in 28 (73.6%) and 22 (57.8%) patients respectively comparable to present study.⁹

Risk factors

The risk factors associated in ruptured EP are numerous enlisted but predominantly few have been evaluated repeatedly in few studies like parity, previous history of ruptured EP, use of LNG pill, PID etc.

PID and Ectopic Pregnancy in number of studies is Rashmi et al 8.1%, In March Banks' study (1998) - 4% In Savitha

Devi's study (2000) - 25% In Rose et al., study (2002) - 34.4% The etiological /risk factors associated in the present population were PID in half (50%) of the cases.¹⁰

Previous history of ectopic pregnancy and parity seem to be significant risk factors for ruptured of an ectopic pregnancy according to Michael Sindos et al study.¹¹ While the probability of another ectopic pregnancy decreased as the parity increased (70%) in observational study by Sobande AA¹², in observational study by Sobande AA and etal 74% multipara developed ruptured EP.^{11,13}

Our results indicate that use of emergency contraceptive pills, in the two forms widely available today, does not increase the risk that a pregnancy after treatment will be ectopic. Use of LNG-EC (levonorgestrel emergency contraception) has been found associated with risk of developing EP incidences ranging from 2.3% -4.1%.^{14,15} There has been number of studies which elaborate the reason of failure of EC due to improper use of EC by user, followed by regular Intercourse, multiple time intake of LNG-EC in the same cycle.¹⁶ In the present cohort the use of LNG-EC was seen in 36.36% cases of ruptured EP. This also reflects that more of the EC user population is being served by the present center.

Another interesting fact is use of medical abortion pills and the relation of EP. The literature suggests that a very low frequency of ectopic pregnancies diagnosed after medical abortion treatment demonstrates that the various pretreatment screening methods that providers use to exclude patients with ectopic pregnancies are successful.¹⁷ Further, there is no evidence to suggest that medical abortion treatment leads to unusual complications for women with ectopic pregnancies. The fact is, these all data include those participants who are using medical abortion under supervision. These studies are done on medical records. The self medication of abortifacient without supervision increases the chances of missing the EP. The overall risk of developing EP by OTC abortifacient is as high up to 1.9% to 6.5%.^{18,19}

Clinical and biochemical markers

The clinical examination in case of acute abdomen gives a better idea when associated with biochemical markers. The most common physical sign was tenderness: abdominal tenderness in 15 (68.18%) and pelvic tenderness in 7(31.18%) patients. The values in previous studies reflected that abdominal tenderness is more (73.6% and 77.7%) and sensitive marker, Shah N et al and Jophy R et al respectively.^{9,20} which was seen in our study too. Per vaginal tenderness was seen in previous studies more as compare to present study.

The correlation between abdominal (64 ± 9.14) and per vaginal tenderness (36 ± 2.77) with TVS collection more than 500 (25 ± 2.08) and less than 500 (49 ± 4.08) reflected that more the collection more the tenderness which is a significant marker in assessment of diagnosis ($p < 0.01$). This is consistent with previous studies like Shalev and colleagues found that the use of TVS in the diagnosis of an ectopic pregnancy has a sensitivity of 87%, specificity of 94% and positive predictive value of 92.5%.²¹ The Trans vaginal ultra sonography (TVS)

is sensitive marker in the diagnosis of ruptured EP and another marker is β -hCG.

Ectopic pregnancy is generally associated with a rise in hCG by no more than 66%, or a fall by no more than 13% from the baseline level, in 48 hours. A ratio lying within this range, along with an absolute hCG value above 1500 IU/L in the absence of any visualized intrauterine pregnancy, can be taken as evidence for a probable ectopic pregnancy. This combined criterion is 92% sensitive and 84% specific.^{22,23} Higher β -hCG levels seem to be significant risk factors for ruptured EP.²⁴ In present study the significant p value (<0.05) noted in the association of GA and β -hCG. The data suggests that higher the value even in the less GA the probability of ruptured is more.

Treatment:

The hemodynamic instability is major factor of morbidity and mortality in ruptured EP cases.

The ectopic pregnancy mortality ratio ranges from 0.48 deaths per 100 000 live births to 0.50 per 100 000 live births reported from US vital statistics for 2003–2007.²⁵ The majority cases presents to emergency in hemodynamic shock which requires emergency laparotomy. The severe anemia due to hemorrhage is a serious morbid factor.

The incidence of hemoperitonium was 90.9% (mean volume 619.05 ml) which is more in comparison to the observation of 86.4% by Rashmi et al and comparable to 93.9% Surya Chandrika Bondada et al.

In literature 97% of ectopic pregnancies occur in the Fallopian tubes. The majority occur in the ampullary or isthmic portions of the Fallopian tubes. About 2-3% occurs as interstitial ectopic pregnancies (arising in the part of the tube which goes through the endometrial cavity). The rare remaining locations include cervical, fimbrial, ovarian and peritoneal sites, as well as previous caesarean section scars.^{26,27} The present study shows similar results.

The intra op laparotomy finding were suggestive of ruptured tubal ectopic in 90.9% cases while tubal abortion in 2 cases. The majority of ectopic site was Right side (legend-1) tubal ectopic (50%) with ampulla in 68.18% time. The comparison to other studies suggests our study comparable to these (table-7). In laparotomy the most common procedure carried out was salpingectomy \pm oophorectomy 86.36%, segmentectomy 9.09% and segmentectomy with recanalization in single case (table-8).

Description of the tissue of ruptured EP²⁸

A) Gross Description:

- Distension of tube with thin or ruptured wall, dusky red serosa and hematosalpinx, possibly with fetal parts identified.

B) Microscopic (histologic) description:

- Intraluminal chorionic villi and extravillous trophoblast (may be degenerated); variable fetal parts
- Decidual change in lamina propria in 1/3; mesothelial reactive proliferation with papillary formation and psammoma bodies

In ampullary pregnancy the muscularis is preserved in 52.2% cases which was seen affected in 68.18% in present

study.²⁹ In isthmic pregnancy, the trophoblast penetrates the tubal wall relatively early and therefore patient present early with symptoms.³⁰ Thus it states that site of ectopic is also associated with appearance of sign and symptoms. The ovary is one of the rare site of ectopic and in previous studies 1.07% to 4.40% cases were seen. In our study we too found single case with rupture ectopic. (legend 2)

CONCLUSION

An ectopic pregnancy can represent in any form within a wide clinical spectrum, ranging from an asymptomatic patient to one in shock and in any age group and parity. The high index of suspicion for history and clinical features and associated biochemical markers, ultrasonography is sensitive still in non availability of resources. An open laparotomy and repair of the affected part is the only treatment in cases of emergency with blood transfusion. The medical management has no role in case of ruptured ectopic with shock.

Hazards and human or animal subjects:

We declare that before the study all participants of the study were informed and after their written consent they were included in the study. We also declare that there is no hazards done to any animal and human during the study. The surgical intervention was the part of the study and was explained to all participant and written consent was taken. The privacy policy of the participants has been maintained.

ACKNOWLEDGEMENT

We are greatly thankful to the CMD of our institute Dr. Vikram I. Shah for encouraging us to conduct research studies. We thank Medical superintendent Dr.C.Niyogi for their valuable support and concerns in view of allowing the data collection, spreadsheet entries and record collection. We express our gratitude to all the participants in the study without whom it could not be a successful research. We also convey our gratitude to the all previous researchers whose great work is giving us guidance in compiling the present article.

ABBREVIATIONS

β hCG - Beta Human Chorionic Gonadotropin, d&c - Dilatation And Curettage, GA - Gestational Age, EP - Ectopic Pregnancy, IVF - In Vitro Fertilization, LNG Pill - Levonorgestrel Pill, MA - Medical Abortifacient, PID - Pelvic Inflammatory Diseases, TVS - Trans Vaginal Ultrasonography,

REFERENCES

1. Varma R, Gupta J Tubal ectopic pregnancy. *BMJ Clin Evid.* 2009.
2. Walker JJ, Ectopic pregnancy. *Clin Obstet Gynecol.* 2007; 50:89-99.
3. Heather Murray, Hanadi Baakdah, Trevor Bardell, and Togas Tulandi, Diagnosis and treatment of ectopic pregnancy. *CMAJ.* 2005; 173: 905–912.
4. Karaer A, Avsar FA, Batioglu S. Risk factors for ectopic pregnancy: a case-control study. *Aust N Z J Obstet Gynaecol.* 2006;46:521–527.

5. Carson SA, Buster JE. Ectopic pregnancy. *N Engl J Med* 1993;329:1174-81. Comments in *N Engl J Med* 1994;330:712-3.
6. Kelly Cleland, Elizabeth Raymond, James Trussell, Linan Cheng, and Haoping Zhu. Ectopic Pregnancy and Emergency Contraceptive Pills: A Systematic Review *Obstet Gynecol.* 2010;115:1263-1266.
7. Rajkhowa M, Glass MR, Rutherford AJ, Balen AH, Sharma V, Cuckle HS Trends in the incidence of ectopic pregnancy in England and Wales from 1966 to 1996. *BJOG.* 2000; 107:369-74.
8. Florin-Andrei Taran, Karl-Oliver Kagan, Markus Hübner, Markus Hoopmann Diethelm Wallwiener, Sara Brucker The Diagnosis and Treatment of Ectopic Pregnancy *Dtsch Arztebl Int.* 2015;112:693–704.
9. Shah N, Khan NH. Ectopic pregnancy: presentation and risk factors. *J Coll Physicians Surg Pak.* 2005;15:535-8.
10. Jophy R, Thomas A, Mhaskar A. Ectopic pregnancy-5 year experience. *J Obstet Gynecol Ind.* 2002;52:55–8.
11. Michael Sindos, Athanasia Togia, Theodoros N. Sergeantanis, Apostolos Kabagiannis, Fotodotis Malamas, Athanassios Farfaras, Ioannis N. Sergeantanis, Vassiliki Bassiotou, Stefanos Antoniou Ruptured ectopic pregnancy: risk factors for a life-threatening condition, *Archives of Gynecology and Obstetrics* 2009;279:621.
12. Sobande AA. Factors influencing reproductive performance following previous ectopic pregnancy. *Saudi Med J.* 2000;21:1130-4.
13. Surya Chandrika Bondada, Malathi T. Clinical Perspective of Ectopic Pregnancy in a Tertiary Care Hospital in Karnataka, India *International Journal of Science and Research* 2017;6:12-23.
14. Lo, S. S. and Ho, P. C. The profile of women who seek emergency contraception from the family planning service. *Hong Kong Med J* 2012;18:299.
15. Gainer, E., Mery, C. and Ulmann, A. Levonorgestrel-only emergency contraception: real-world tolerance and efficacy. *Contraception* 2001;64:17.
16. Jian Zhang, Cheng Li, Wei-Hong Zhao, Xiaowei Xi, Shu-Jun Cao, Hua Ping, Guo-Juan Qin, Linan Cheng and He-Feng Huang Association between levonorgestrel emergency contraception and the risk of ectopic pregnancy: a multicenter case-control study *Scientific Reports* volume5, Article number: 8487 (2015) doi:10.1038/srep08487
17. Shannon C, Brothers LP, Philip NM, Winikoff B Ectopic pregnancy and medical abortion. *Obstet Gynecol.* 2004;104:161-7.
18. Sarojini, T. R. Ashakiran, B. T. Bhanu, and Radhika. Over-the-counter MTP Pills and Its Impact on Women's Health *J Obstet Gynaecol India.* 2017; 67: 37–41.
19. Kavina S, Munshi, Rajal V. Thaker, Jagruti M. Shah, Bhavna N. Mewada Self-medication of abortion pills and its complications: an observational study *International Journal of Reproduction, Contraception, Obstetrics and Gynecology* Munshi KS et al. *Int J Reprod Contracept Obstet Gynecol* 2018;7:205-209.
20. Shalev E, Yarom I, Bustan M, Weiner E, Ben-Shlomo I. Transvaginal sonography as the ultimate diagnostic tool for the management of ectopic pregnancy: experience with 840 cases. *Fertil Steril.* 1998;69:62–65.
21. Condous G, Kirk E, van Calster B, van Huffel S, Timmerman D, Bourne T. Failing pregnancies of unknown location: a prospective evaluation of the human chorionic gonadotrophin ratio. *BJOG.* 2006;113:521–527.
22. Kirk E, Condous G, van Calster B, van Huffel S, Timmerman D, Bourne T. Rationalizing the follow-up of pregnancies of unknown location. *Hum Reprod.* 2007b;22:1744–1750.
23. Iran J Reprod Med 2015;13:101-106. Predictive value of maternal serum β -hCG concentration in the ruptured tubal ectopic pregnancy Roya Faraji Darkhaneh, Maryam Asgharnia, Nastaran Farahmand Porkar, Ali Akbar Alipoor. M Predictive value of maternal serum β -hCG.
24. Creanga AA, Shapiro-Mendoza CK, Bish CL, Zane S, Berg CJ, Callaghan WM. Trends in ectopic pregnancy mortality in the United States: 1980–2007, *Obstet Gynecol* 2011;117:837-843.
25. Fylstra DL. Ectopic pregnancy not within the (distal) fallopian tube: etiology, diagnosis, and treatment. *Am J Obstet Gynecol.* 2012;206:289-99.
26. Dr Mary Harding, Ectopic Pregnancy, *mergency Medicine and Trauma* 23 Dec 2015 <https://www.ectopic.org.uk/professionals/clinical-features/>
27. Nicole Riddle, Jamie Shutter, Fallopian tubes Benign or nonneoplastic conditions, Ectopic / tubal pregnancy 4 August 2017, last major update April 2013
28. Sowmya S, Priya R, Meenakshi P, Shwetha B . Study of trophoblasts and histological changes of fallopian tube in tubal pregnancy and anatomical considerations for its early rupture, *international journal of anatomy and research, Int J Anat Res* 2014;2:609-13.
29. Senterman M, Jibodh R, Tulandi T, Histopathologic study of ampullary and isthmic tubal ectopic pregnancy. *Am J Obstet Gynecol.* 1988;159:939- 41.

Source of Support: Nil; **Conflict of Interest:** None

Submitted: 27-05-2018; **Accepted:** 29-05-2018; **Published:** 11-06-2018