Review Article

First trimester bleeding and pain

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Abstract. The most common gynecologic emergency is vaginal bleeding and pain in patients who admit to emergency departments. Early pregnancy bleedings are observed in 20% of pregnancies. Immediate and appropriate management and proper treatment of pregnant that admit emergency unit with anxiety of bleeding is important. Doctor in emergency unit should evaluate and take the rapid history of the patient and apply laboratory tests, ultrasonography and multidisciplinary consultations. In pregnant that admit emergency unit with first trimester bleeding and pain, first of all ectopic pregnancy and incomplete abortus should be differentiated. After taking medical history and performing physical examination carefully, β-hCG level together with ultrasonography is more effective in evaluation of vaginal bleeding and pain at early pregnancy period. Appropriate management could be done later according to the differential diagnosis.

Key words: First trimester, bleeding, pelvic pain.

First trimester is described as period of first 14 weeks according to last menstrual period. Pregnancy related complications are more common in this period compared to other trimesters. Vaginal bleeding and pain are the most common complications. Early pregnancy bleedings are observed in 20% of pregnancies [1]. Immediate and appropriate management and proper treatment of pregnant that admit emergency unit with anxiety of bleeding is important. Doctor in emergency unit should evaluate patient admitted like this with rapidly taken history, laboratory tests, ultrasonography and multidisciplinary consultations. Information about early pregnancy bleeding and its pattern is limited. The differential diagnosis of patients presenting with first trimester bleeding and pain are demonstrated in Table 1.

Bleedings in this period can be mild, but also can be huge enough to threaten life. In pregnant that admit emergency unit with first trimester bleeding and pain, first of all, ectopic pregnancy and incomplete abortus should be differentiated. Ectopic pregnancies are the most common reason of maternal mortality among first trimester gestations [2].

Table 1. Differential diagnosis in pregnant, who present first trimester bleeding and pelvic pain.

<table>
<thead>
<tr>
<th>Miscarriage (threatened, incomplete, complete, septic)</th>
<th>Hydatidiform mole</th>
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<tr>
<td>Ectopic Pregnancy</td>
<td>Ovarian cysts</td>
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<tr>
<td>Fetal demise</td>
<td>Ruptured corpus luteum of pregnancy</td>
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<td>Unembryonic grosses</td>
<td>Torsion</td>
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<tr>
<td>Subchorionic hemorrhage</td>
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Generally, first trimester bleedings are accepted as risk factor for poor fetal prognosis [3]. Several studies reported that 15-20% of clinically defined pregnancies terminate with miscarriage [4]. Among patients that admit with first trimester bleedings, in 30% miscarriage develops, whereas in 10-15% ectopic pregnancy and in 0.2% mole hydatidiform is detected. Approximately in 50% of these pregnancies, gestation survives up to 20 weeks [5]. Vaginal bleeding as early pregnancy complication always should be considered as an important condition. Localization of pregnancy, viability of the fetus and gestational week should be clearly defined. Patients that admit emergency unit with early pregnancy bleeding and pain should be evaluated by serum β-hCG levels and high

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resolution transvaginal ultrasonography. Rapid transport to early pregnancy unit should be provided. Amount of bleeding should be evaluated and even if the bleeding is mild vital signs of patient should be noted.

After detection of vital signs, patient should be evaluated by cervical examination (via speculum), pelvic examination and transvaginal ultrasonography. Especially when vaginal bleeding is excessive and tension is low, gestational material in cervical region should be evaluated and if there is, it should be removed immediately. If patient admits to emergency unit in shock, and if there is pregnancy suspicion due to vaginal bleeding, incomplete abortus and ruptured ectopic pregnancy should be considered initially. If gestational material could not be inspected in cervical examination, IV route should be opened and rapid transfusion should be performed; besides vital signs should be monitored and blood support to patient should be supplied by evaluation of coagulation tests, cross match, hemoglobin and hematocrit levels. If patient stabilization could not be achieved, intraperitoneal bleeding should be considered and, if symptoms are correlated with ruptured ectopic pregnancy, immediate laparatomy should be performed.

Diagnosis

History

Last menstrual period and previous pregnancy history of patient should be carefully evaluated (miscarriage, extrauterine pregnancy, gestational trophoblastic disease, etc). If number of miscarriages in previous pregnancies is high, risk is high in current pregnancy [6]. In patients with previous history of single extrauterine pregnancy, risk is increased by 3 times, whereas is increased by 16 times in those with twice extrauterine pregnancies [7]. In patients that have previous molar pregnancy, risk is defined to be increased by 10 times [8]. In patients that have frequent miscarriage history, the relative risk of mole hydatiforme was found to be increased by 3 times [9]. In ART patients extrauterine and heterotopic pregnancy rates are increased. Clayton et al. reported the extrauterine pregnancy rate as 2.1% in their study which was irrelevant with the applied method. Pain together with bleeding should be asked. It should be also asked if pain is unilateral or bilateral and how it disseminates. Unilateral pain could be related to extrauterine pregnancy and it could be due to distension of pregnancy related to the capsule of corpus luteum cyst. Shoulder pain should be evaluated as rupture of extrauterine pregnancy and retrograde hemorrhage due to miscarriage.

Physical Examination

Vital signs of patient should be monitored and general condition of patient must be evaluated. If there is an intraperitoneal hemorrhage; abdominal distension, periumbilical color change (Cullen sign) and, rebound tenderness could be observed. During cervical examination, cervical channel opening, presence of gestational material and amount of bleeding is determined. Later on, pain in cervical movements is evaluated by bimanuel examination. Severe pain during cervical movements indicates extrauterine pregnancy.

Ultrasonography

Ultrasonography is one of the most important methods in evaluation of early complications of pregnancy. It is important to know normal sonographic findings related to early pregnancy period. Gestational sac is detected in 5th week, yolc sac in 6th week and fetal heart movement together with fetal poleis observed in 7th week of gestation [10]. The first sign of intrauterine pregnancy is gestational sac and it defines chorionic cavity. Two concentric echogenic ring surrounding gestational sac which is called as “Double echogenic sign” is the earliest finding in intrauterine pregnancy. Yolc sac is the earliest sign of embryonic development and this structure can be detected by ultrasonography when gestational sac diameter exceeds 8 mm. The diameter of gestational sac varies usually between 2.5 mm. and 5.6 mm. which latter is the earliest sign of impending miscarriage. In a period between 4 and 7 weeks according to last menstrual period, development is very fast.

It is hard to differentiate sac representing real intrauterine gestation from pseudosac representing extrauterine pregnancy when gestational sac diameter ranges between 2 and 5 mm. Besides, this structure could also be a decidual cyst representing insufficient intrauterine pregnancy.

Ultrasonography combined with β-hCG in diagnosis of miscarriage does not reach a certain consensus in different miscarriage forms. In the differential diagnosis of incomplete and complete miscarriage, the cut-off value for endometrial thickness was taken between 8-15 mm in different studies [11,12]. By this aspect, one issue to be
considered is to exclude extrauterine pregnancy when endometrial thickness is below 8 mm. If fetal heart movement is not observed when CRL is 6 mm or above, this is accepted as fetal demise. When CRL is 6 mm or below and fetal heart movement is still lacking, fetal demise is thought [13]. Fetal heart movement is between 85-90 beat/min in 6th week whereas it reaches 180 beat/min in 9th week. Bleeding from developing placenta may lead to subchorionic hemorrhage. And it leads to hypoechogenic image between chorionic membrane and uterine wall in ultrasonography. While in some studies, correlation is reported between fetal demise and size of hematoma and premature birth [14], other studies did not support this correlation. Incongruence of CRL with gestational age, irregular gestational sac and abnormalities in fetal heart beat are all related with poor pregnancy outcome. Gestational trophoblastic diseases are consisted of two subgroups, mole hydatiforme and gestational trophoblastic tumors. In complete mole hydatiforme, ultrasonographic findings are enlarged uterus and multiple anechoic complex heterogeneous mass image representing hydropic villi [15]. This ultrasonographic image is defined as snowstorm view.

In early period, Doppler ultrasonographic examination is useful in differential diagnosis of mole hydatiforme from incomplete abortus. Typically high velocity, low resistance trophoblastic flow is detected [16]. In transvaginal ultrasonography, ectopic pregnancy can be observed in different presentations. The diagnosis of ectopic pregnancy is considered when gestational sac and embryo is detected in extrauterine area. There is no gestational sac within endometrial cavity. Pseudogestational sac that is thought to develop secondary to hormonal variations is observed in 10-20% of extrauterine pregnancies and is thought to be developed by deposition of fluid in endometrial cavity and decidual reaction. Gestational sac detected in early period is hardly differentiated from pseudogestational sac. Generally pseudogestational sac is centrally located and has an oval, thin echogenic rim. There is no double sign. Low impedance arterial flow in Doppler ultrasonographic investigation is helpful in differential diagnosis of gestational sac from pseudogestational sac [17].

Ninety-seven percentages of extrauterine pregnancies is located in ampullary and isthmic region of fallopian tubes. The most common sonographic finding of extrauterine pregnancy is the presence of extravascular adnexial mass. In a meta-analysis of 10 different studies reported by Brown and Doubilet, the detection of adnexial mass alone has a 96.3% positive predictive value, 94.8% negative predictive value and 98.9% specificity and 84.4% sensitivity in diagnosis of extrauterine pregnancy [18]. Tubal ring in adnexial area is present in 68-78% of ectopic pregnancies [19]. One of the most important clues in evaluation of extrauterine pregnancy is corpus luteum. In 85% of extrauterine pregnancies, corpus luteum is on ipsilateral ovary [20]. There is hyperechogenic fluid in cul de sac due to tubal abortion or rupture. In contrary to all these findings, in 26% of ectopic pregnancies, no sign is detected by transvaginal ultrasonography [21].

**β-hCG**

When β-hCG level is evaluated together with ultrasonography, it can be more effective in evaluation of vaginal bleeding and pain in the early pregnancy period. During evaluation of β-hCG together with ultrasonography, discrimination zone is important [22]. In a study, Bernhart et al. reported that intraterine gestational sac is detected by 91.5% when discrimination level is expected as 1500 IU/L and above and gestational sac is detected by 28.6% when β-hCG is 1500 IU/L and below [23]. Single β-hCG level has no diagnostic importance in most cases. In unknown pregnancies which location is not defined, 66% increase in β-hCG levels by 48 hours intervals supports intraterine pregnancy [24]. In gestational trophoblastic diseases, β-hCG level can increase by 20 times but this is not a specific finding.

**Management**

**Abortion or miscarriage**

Threatened miscarriage must be followed-up constantly. In 50% of early pregnancy bleedings, pregnancy can survive [5]. There are three types of managements in miscarriages (expectant, medical, surgical). Expectant management decreases need for surgical intervention and supplies continuation of women’s daily routine life. Expectant management is related to prolonged bleeding time compared to medical and surgical intervention [25,26]. Besides Nielsen et al. declared that expectant management in incomplete abortus was as effective as surgical intervention [12]. Spontaneous resolution of incomplete miscarriage is reported as in between 91 to 96% [13,27],
whereas it is reported as 24.7% up to 84% in missed miscarriages [28,29].

In medical management, usually prostoglandin analogues (misoprostol, gameprost) and antiprogesteron (mifepriston) combinations are offered [30-32]. In surgical management, sharp curettage and vacuum aspiration is used.

**Ectopic pregnancy**

When selection criteria is well defined, expectant management can be a good choice in extrauterine pregnancy. It can be applied to hemodynamically stabilized, asymptomatic patients. Gestational sac size should be below 4 cm and fetal heart beat should not be detected in ultrasonography [33]. β-hCG can be used in follow-up. B-hCG should be monitored with 3 to 4 day intervals until it reaches levels below 10 IU/l [34]. Success rate is approximately 75% in those whose β-hCG level is below 1000 IU/l [35], whereas it is 25% in those, whose levels are above 2000 IU/l [36].

In medical treatment, single or multiple doses of methotrexate regimen can be applied and it is especially appropriate when surgical intervention is challenging; e.g. interstitial or cervical pregnancies. Methotrexate is used in doses of 1 mg/kg or 50 mg/m² [37]. Success rate ranges between 71 to 100% [38] and it is mainly related to initial β-hCG concentration, size of extrauterine pregnancy and presence of fetal heart rate.

Modern modality in surgical intervention of tubal ectopic pregnancies is laparoscopic surgery [39,40]. Laparatomy is first choice in hemodynamically unstable patients.

**Hydatiform mole**

In complete molar pregnancies; in the absence of fetal material and up to 12 mm of endometrial wall thickness, suction curettage is the treatment of choice. In partial molar pregnancies, when size of fetal pieces affects suction curettage usage; medical termination can be used.

References