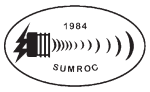
Journal of Medical Ultrasound (2017) xx, 1–6



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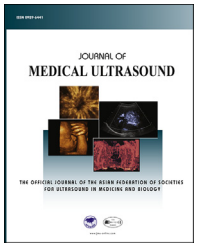

Original Article

Chorionic Bump in First-trimester Sonography

Ladan Younesi, Razieh Shahnazari*

Iran University of Medical Sciences, Tehran, Iran

Received 2 February 2017; accepted 10 April 2017
Available online ■ ■ ■

KEYWORDS
Chorionic bump,
First trimester,
Live birth rate,
Sonography

Abstract *Objectives:* The present research was motivated by providing new insight into early pregnancies with a chorionic bump diagnosis in first-trimester sonography and its impact on live birth rate.
Methods: To determine the rate of CB, first trimester sonograms of pregnant women referring to Akbarabadi Hospital, which is a treatment and training center affiliated to Iran University of Medical Sciences as well as those referring to a private center were analyzed. The total number of transvaginal sonographies performed was 1900 cases from whom 8 cases of CB were detected. The chorionic bump size and number and history of infertility or coagulation disorders were considered as our independent variables and multiple gestation with pregnancy outcome as dependent ones.
Results: Overall, the prevalence rate of CB was 0.4% (4 per 1000), with 8 patients diagnosed with CB from 1900 the first trimester pregnant women. Of 8 pregnant women, 5 showed live birth (62.5%) and 3 experienced fetal demise (37.5%). The chorionic bumps ranged in size from 0.1 cc to 1.8 cc (average, 0.73 cc). No significant relationship was found between history of smoking, coagulopathy, infertility, multiple gestation and the size of CB.
Conclusions: The main finding was that the frequency of live birth in our sample was 62.5% (5 from 8). The clinical inference is that a chorionic bump on first-trimester sonography does not definitely guarantee a secure prediction. The correlation between bump size and pregnancy outcome is not clear, which warrants further research.

Authorship & conflicts of interest: The two authors have contributed sufficiently to the project to be included as authors. To the best of our knowledge, no conflict of interest, financial or other, exists.

* Correspondence to: Razieh Shahnazari, Iran University of Medical Sciences, Hazrat-e Rasool Hospital, Radiology Department, Niyayesh St, Satarkhan St, Tehran, Iran.
E-mail address: rsh.medicen1990@gmail.com (R. Shahnazari).

http://dx.doi.org/10.1016/j.jmu.2017.04.004

Please cite this article in press as: Younesi L, Shahnazari R, Chorionic Bump in First-trimester Sonography, Journal of Medical Ultrasound (2017), http://dx.doi.org/10.1016/j.jmu.2017.04.004

Introduction

A Chorionic Bump (CB), which has been identified as "an irregular, convex bulge from the choriodecidual surface into the first-trimester gestational sac," was first reported by Harris et al. in 2006 as an important finding in early first trimester pregnancy sonography as a risk factor for pregnancy loss, with live birth rate of less than 50% [1]. The cause of CB remains unclear and several assumptions have been proposed as to whether it is the cause of early demise or follows it [2]. The chorionic bump might represent the following: a hematoma, an area of hemorrhage, a non-embryonic gestation, or a demise of an embryo in a twin pregnancy [2,5]. No clear pattern is detected using color and power Doppler examination. From 2006 to 2015, several studies have been conducted on CB including Arleo et al. [3] who provided a systematic review and meta-analysis of CB in pregnant patients and associated live birth rate, Harris et al. [1] who studied a prospective cohort, Sana et al. [4] who carried out a case—control study, as well as a few case reports [5—8] and Joseph et al. [9] who published a retrospective cohort.

Although CB is an uncommon finding, its incidence rate has been reported to be 1.5—7 per 1000 [4], impressively 23 per 1000 by Joseph et al. who studied first trimester chorionic bump associated with fetal aneuploidy in a high risk population [9]. The viable pregnancy outcome rate in the first trimester is reported between less than 50% to 65% and an unexpected 83% if other factors of pregnancy are normal [2,4].

Although it is considered as a risk factor in loss of pregnancy, many radiologists and gynecologists may not be familiar with it. Thus, the present research was motivated by providing new insight into early pregnancies with a CB diagnosis in first-trimester sonography and its impact on live birth rate.

Materials and methods

This study is a retrospective report on a small case series of 8. The study is approved by Institutional Review Board. For determination of CB rate, analysis of first trimester sonograms of pregnant women referring to Akbarabadi Hospital, which is a treatment and training center affiliated to Iran University of Medical Sciences as well as those referring to a private center was conducted ($\approx$5 per day). All sonographies were performed by the same radiologist who is also a university lecturer.

Transvaginal sonography was performed considering such factors as confirming or rejection of intrauterine pregnancy, ectopic pregnancy, vaginal bleeding and pain also dating.

Transvaginal sonography was performed for the first trimester pregnant women at Akbarabadi Hospital, 5 per day, 30 per week, 120 cases per month, amounting to a total number of 1440 plus 460 cases performed at the private center in the evening. The total number of transvaginal sonographies performed was 1900 cases from whom 8 cases of CB were identified.

Follow-up sonography once or twice a week, or more often if the gynecologist indicated, was considered for CB patients.

Patients who were at least 18 years old with diagnosis of chorionic bump in first trimester sonography were qualified as our study cases. Patients with miscarriage or nonviable pregnancy outcome, systemic diseases, coagulopathy, and multiple gestations were not excluded.

The medical records were completed in the form of questionnaire by sonographist, including details such has name, age, date of conception, the volume of CB, mean sac diameter (MSD), fetal heart rate (FHR), crown-rump length (CRL), vaginal bleeding, experience of a previous nonviable pregnancy outcome and its cause, coagulopathy or systemic diseases, smoking, diabetes, description of infertility, and finally pregnancy outcome as well as delivery mode (Vaginal delivery or Cesarean).

We have some limitations in our study. For example, due to the recent introduction of CB, and the possibility of failure to diagnose CB or mistaking it with subchorionic hemorrhage only the sonographies performed by the university lecturer were included in the data and those performed by residents were excluded. Also, it should be noted that considering low incidence in both patients and literature, studies on CB have no obvious exclusion criteria so all patients with chorionic bump with at least 18 years old were included in the study, even with previous history of abortion or misoprostol usage as our limitation in study.

Transvaginal sonography was performed with Samsung Medison SW80 at Akbarabadi Hospital and Medison V20 at the private center.3-D measurement of chorionic bump was performed with electronic calipers to access its volume (elliptical volume formula: length $\times$ width $\times$ height $\times$ 0.52), and then, if present, was registered on serial sonograms. Statistical methods used for data analyzation were as follows: To define the study patient population, averages and ranges were calculated for continuous variables, and numbers and percentages were calculated for categorical variables. The statistical analysis was performed using multivariate logistic regressions to investigate the relation between each independent variable and presence of a live birth. $P < .05$ was considered significant.

Results

The incidence rate of CB was 0.4% (4 per 1000), with 8 patients diagnosed with CB from 1900 first trimester pregnant women. Table 1 shows the characteristics and sonography findings for these 8 patients.

As 5 out of 8 patients were not diagnosed with fetal embryo at the time of the study so the gestational age was recorded on MSD instead CRL.

It should be noted that in normal pregnancies the embryo is definitely identifiable by TVS when the MSD is 16—18 mm or more [10] but patient 7 with MSD of 20 mm showed no fetal embryo.

Overall, of 8 pregnant women, 5 showed live birth (62.5%) and 3 experienced fetal demise (37.5%). The chorionic bumps ranged in size (maximum dimension) from 0.1 cc to 1.8 cc (average, 0.73 cc). The average age of pregnant mothers was 32 years (23—41 years) and the average gestational age was 7 weeks 0 (range, 5 weeks 4 days—8 weeks 5 days).

Please cite this article in press as: Younesi L, Shahnazari R, Chorionic Bump in First-trimester Sonography, Journal of Medical Ultrasound (2017), http://dx.doi.org/10.1016/j.jmu.2017.04.004