The Prevalence and the Clinical Significance of the Chorionic Bump in Upper Egypt

Original Article

Ahmed A. Taha[1], Hossam Ramadan Abdulwahab[1], Mohammed S. Fahmy[1], Hany F. Sallam[1] and Ahmed Hussien Mohammed[2]

Department of Obstetrics and Gynecology, Faculty of Medicine, [1]Aswan University, [2]Sohag University

ABSTRACT

Objective: The purpose of this study is to provide some insight on our practical contact of the chorionic bump in upper Egypt, including its prevalence, subsequent prenatal course, and pregnancy outcome.

Patients and Methods: All referred pregnant ladies to our specialized feto-maternal clinic at at Sohag, Aswan and Asuit governorate were offered ultrasound in early pregnancy to confirm pregnancy, diagnosis of PUL, determination of viability, suspected partial mole, and vaginal bleeding. The preceding LMP or conception date were used to estimate gestational age. all patients were asked for infertility treatment, previous obstetric history, coagulopathy or aspirin intake. Transvaginal ultrasound was done using Philips ClearVue 650. The appearance or lack of a chorionic bump was verified by two expert examiners differently. and documented for number of the CB, its position, appearance of yolk sac, fetal heart rate, then the size of the chorionic bump was measured in three dimensions and volume of the bump was calculated by this formula (length × width × height/2), 3D TVS was offered to all the patients follow up was done over next 2 weeks. the sonographic difference was compared.

Results: Throughout span of a 4-year studies from June 2019 to December 2022, The incidence of chorionic bump in our study was 0.45%, with 12 patients diagnosed after examination of 2610 patients aged 19 -41 years old. Presentation of the cases were variable, with PUL (8.3%), determining viability (16.7%), and checking for suspected partial moles (25%) faced in most the cases. The identification of a chorionic bump made when a ultrasound revealed an irregular, convex protrusion from the choriodecidual surface into the first-trimester gestational sac (GS). The lesion's dimensions ranged from 0.05 to 10.8 cm3, and also its average diameter was around 0.6 and 3.4 cm. Twelve individuals were detected with chorionic bumps; nine (75%) had a single bump, three (25%) had two bumps, and in this latter group all pregnancies ended in demise (100%) as a consequence. 3 of the twelve patients with chorionic bump were wrongly diagnosed as partial moles. The size of CB and pregnancy outcome were not strongly linked. Overall, (8/12) (66.6%) showed live birth; one was Preterm delivery admitted to NICU then discharged. (33.3%) experienced fetal demise; three of them were aborted at the time of CB diagnosis. Interestingly, the time period required for the disappearance of CB varied, but most cases experienced disappearance during the next visit; over 2weeks suggesting absorption of the pathology i.e. hematoma. Finally, in none of the cases there were any possible long-term defects.

Conclusion: Our research has revealed that the chorionic pump is uncommon finding that may have misdiagnosed during first trimester screening, almost always, it is slowly fading away over time. representing its pathology as a hematoma, and it doesn't considerably increase the likelihood of miscarriage in the first trimester unless it is multiple. Despite this, obstetricians and radiologist should be aware of this sceptical finding when providing counselling to patients and their families.

Key Words: Chorionic bump, first trimester, obstetric US, pregnancy outcome, upper Egypt.

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Corresponding Author: Ahmed Abdelrahem Ahmed Taha, MD, Department of Obstetrics and Gynecology, Faculty of Medicine, Aswan Yniversity, Egypt, **Tel.:** +2 010 9751 5343, **E-mail:** Ahmedoramy@yahoo.com

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INTRODUCTION

A chorionic bump (CB) is a sonographic finding which was first described in 2006 by Harris *et al* as an "irregular convex mass from the choriodecidual surface into the early gestational sac"[1]. The exact etiology of this finding is uncertain, however, it could a hematoma[1], a small blood aneurysm derived from the placenta, a blighted gestation is being absorbed, or a vanishing embryo in multiple pregnancies, also it could be related to infertility treatment[3,4,5].

However, because of the low reported frequency of the CB in the literature (1.5–7 per 1000 pregnancies), it represents an uncommon finding detected by ultrasound in early pregnancy before 11 weeks' gestation[1,2]. It may not

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be familiar to the majority of radiologists and obstetricians, and it is considered a cause for referral to expert obstetric imagers.

Most of the patients diagnosed with such CB are a symptomatic and only detected in early pregnancy during screening for aneuploidy; however, a clinical history of unremarkable pain or vaginal bleeding, associated with a spontaneous tubal ectopic pregnancy, was reported[6].

There is controversy about the prognostic value of CB. While the first report by Harris *et al* reported a guarded prognosis with increased first-trimester and early second-trimester pregnancy loss in the study group when compared to the pregnancy of the general population (live birth rate <50%), later studies reported a better prognosis with a live birth rate up to 65%[4]. The presence of an isolated chorionic bump is associated with an increased risk of fetal chromosomal abnormality in a group of patients who are at risk for aneuploidy[6].

The purpose of our study is to provide practical contact with the chorionic bump, providing information on the prevalence, subsequent antenatal course, and pregnancy outcome associated with this entity in our locality in upper Egypt.

PATIENTS AND METHOD

This was a multicenter, board-approved study with a waiver of informed consent. during the period from January 2019 to January 2022, at specialized feto-maternal clinics. all referred patients were offered ultrasound in early pregnancy with the purpose of confirmation of pregnancy, diagnosis of PUL, determination of viability, suspected partial mole, and vaginal bleeding in early pregnancy in our institution, and were screened for a localized, irregular convexity or protrusion in the surrounding choriodecidual space into the early gestational sac is referred to as a "chorionic bump present". Patients with chorionic bump were questioned about their history of infertility medications, past obstetric history, coagulopathy, or aspirin intake. gestational age was estimated using the patient's last LMP, or conception date was prospectively followed through the pregnancy care program till completion of delivery. Transvaginal ultrasound was done by using Philips ClearVue 650 (Philips Medical Systems) by operators in each center at Sohag, Aswan, and Assuit governorates. By sending US CB images alongside other images without a CB to two expert examiners who had been blind to all patient records and independently determined the chorionic bump finding, the inter-observer and intra-observer agreement, and accuracy in identifying the presence or absence of a chorionic bump were tested. patient with the diagnosis of a chorionic bump, the number the area of CB as well as its three-dimensional size was calculated by this formula: (length × width × height/2), color Doppler was applied but minimized because of concern about energy deposition in the first trimester. 3D ultrasound volume was obtained using the Philips ClearVue 650 (Philips Medical Systems) equipped with 3D9-3v Endocavity probe (3~10Mhz) follow up by transvaginal ultrasound was done every 2 weeks in a patient with a chorionic bump. Finally, analysis was conducted to make a correlation between the chorionic bump, gestational age, mother's age, number of lesions, size of lesions, and pregnancy outcome was studied by organizing data on an Excel sheet.

RESULT

According to the analysis, the incidence of the chorionic bump in our study was 0.45% (4.5 per 1000). Twelve patients with a chorionic bump were diagnosed after the examination of 2610 patients in early pregnancy at our facility, our patients were aged 19–41 years, with an average age of 28.6 years. One patient was primi-gravida (8.3%), and the other 11 were multigravida women (91.6%), they had a history of one, two, and three first-trimester abortions (41.6ey had a history of one, two, and three first-trimester abortions (41.6, 16.8, and 16.8%, respectively). None of them had a history of smoking, coagulopathy, infertility, or multiple gestations. The average gestational age when the first detection of a CB was found were 7.6 weeks. The presentation of the patients who had been referred for ultrasound in early pregnancy was variable, with the purpose of diagnosing PUL (8.3%), determining viability (16.7%), checking for suspected partial moles (25%), and vaginal bleeding (50%). Other non-specific symptoms, including lower abdominal pain and excessive vomiting, had been reported. A diagnostic ultrasound was offered to all patients and revealed an irregular, convex bulge from the choriodecidual surface into the first-trimester gestational sac; which led to the diagnosis of a chorionic bump (CB) (Figure 1). CB has a different appearance that ranges from hypoechoic to hyperechoic, often with a hypoechoic center (Figure 2, 5-b). The average diameter of the lesion in the largest dimension ranged in size (maximum dimension) from 0.6 cm to 3.4 cm (average, 2.3 cm), with volumes ranging from 0.5 to 10.8 cm3 (average, 2.7 cm^3) (Figure 3). Two other patients also had sub-chorionic hemorrhages (Figure 4). Of the twelve patients with a diagnosis of a chorionic bump, nine (75%) had a single bump, and three (25%) had two bumps; in this latter group with multiple bumps (Figure 5), 100% of pregnancies ended in miscarriage.

Three of our patients (25%) were wrongly diagnosed by radiologists as having a partial mole. The first patient was diagnosed with a chorionic bump at 8 weeks, and follow-up after 2 weeks revealed the disappearance of the chorionic bump. The second patient was wrongly diagnosed with a partial mole at 6 weeks gestation that vanished at 10 weeks gestation. The third patient was also misdiagnosed as a partial mole at 6 weeks gestation, and a follow-up with the patient by ultrasound revealed the disappearance of the chorionic bump at 16 weeks (Figure 6). Seven of the cases (58.3%) with chorionic bumps presented with bleeding, and three of them (42.8%) ended in early pregnancy loss.

No significant relationship was found between these factors and the size of the CB.

Of the twelve patients, nine patients (75%) had previous one abortion (33.3%), two (16.6%), or three (8.3%) previous abortions during the first or second trimester. Overall, of twelve pregnant women, eight gave live birth (66.6%); one was preterm delivery; and four experienced fetal demises (33.3%); three of them were aborted at the time of CB diagnosis.

Interestingly, the time period required for the disappearance of CB varied, as it was noted that the longest period was 16, 18 weeks (Figure 6), i.e., after about "10 and 8 weeks" of follow-up, respectively, while most cases experienced the disappearance of CB during the next visit, i.e., about a 3-week interval, suggestive of absorption of the underplaying pathology, i.e., hematoma. No one with a diagnosis of a chorionic bump prenatally was associated with a birth defect.

Finally, there were no long-term complications in any of the cases. The summary of the analysis has been presented in (Table 1).

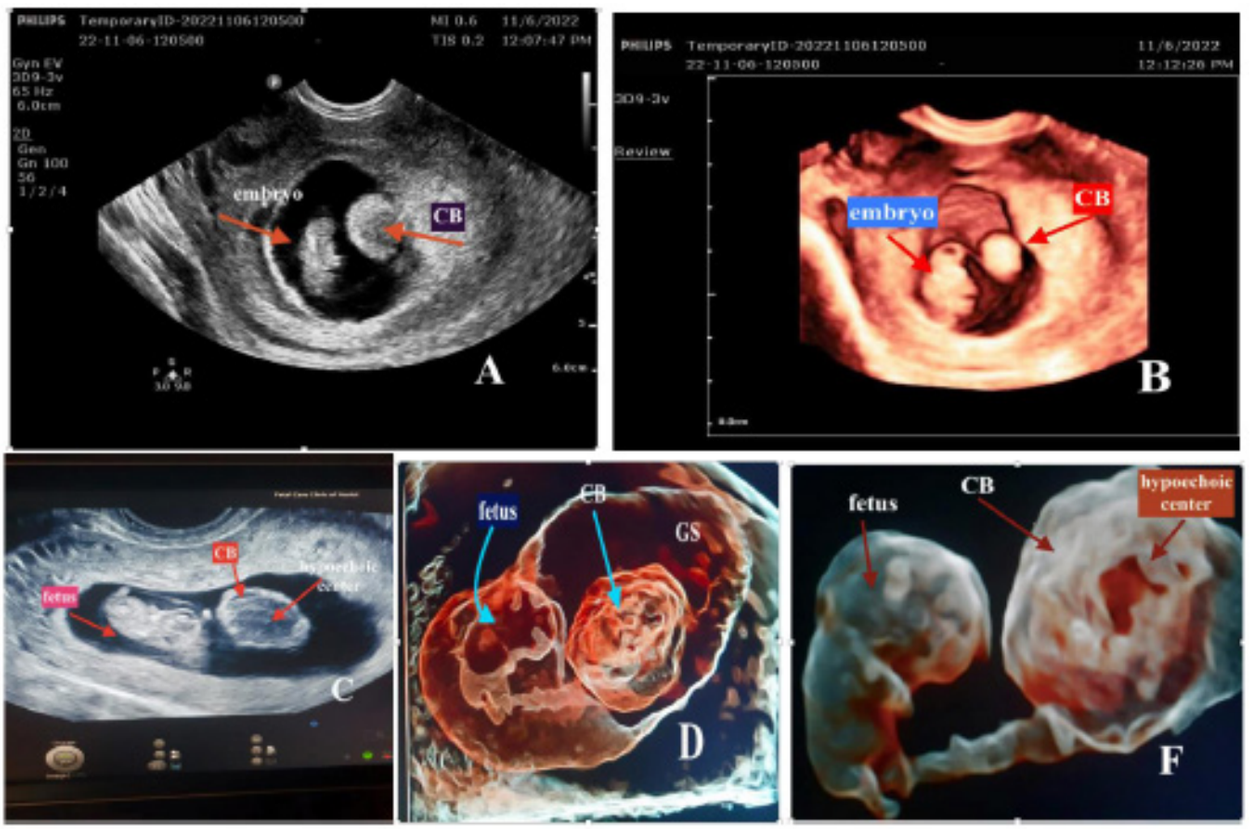

Fig. 1: (1 A) 2D transvaginal ultrasound feature of 6- weeks embryo "red arrow "and beside it an oval-shaped bulging lesion from the choriodecidual space into the gestational sac, suggestive of the chorionic bump (CB) "red arrow". Figure (1- B) 3DTVS of the previous patient data. Figure (C) show 6-weeks fetus with a large chorionic bump with the hypoechoic center and hyperechoic (isoechoic to chorion) rim measuring 29 X 25 mm in maximum dimensions. Figure (D, F) a 6-week pregnancy 3D/4D radiance view HDlive shows the edges the embryo 6- weeks old very well, with characteristic CB nearby umblical cord with no vascularity on Doppler US.

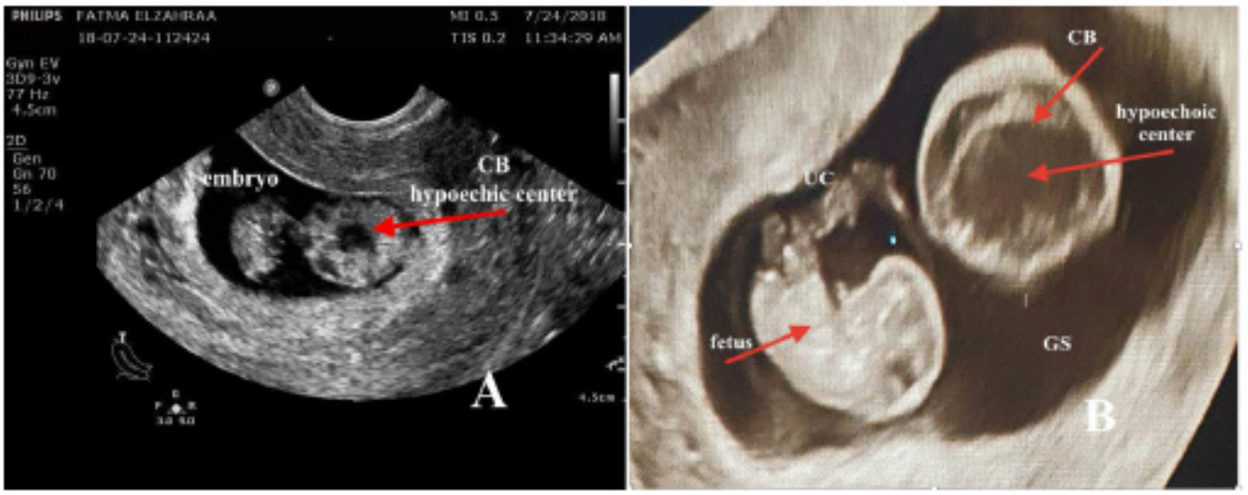

Fig. 2: (A) 2D transvaginal ultrasound of 5- weeks embryo and there is a small lesion protruding from the gestational sac wall into the cavity, with central hypoechoic "red arrow" and peripheral hyperechoic rim, and no vascularity is consistent with the chorionic bump. (B) 3D TVS of 9- weeks fetus with a larger CB measuring 31x 27 mm in its maximum dimension, note the characteristic hypoechoic center of the CB with hyperechoic rim.

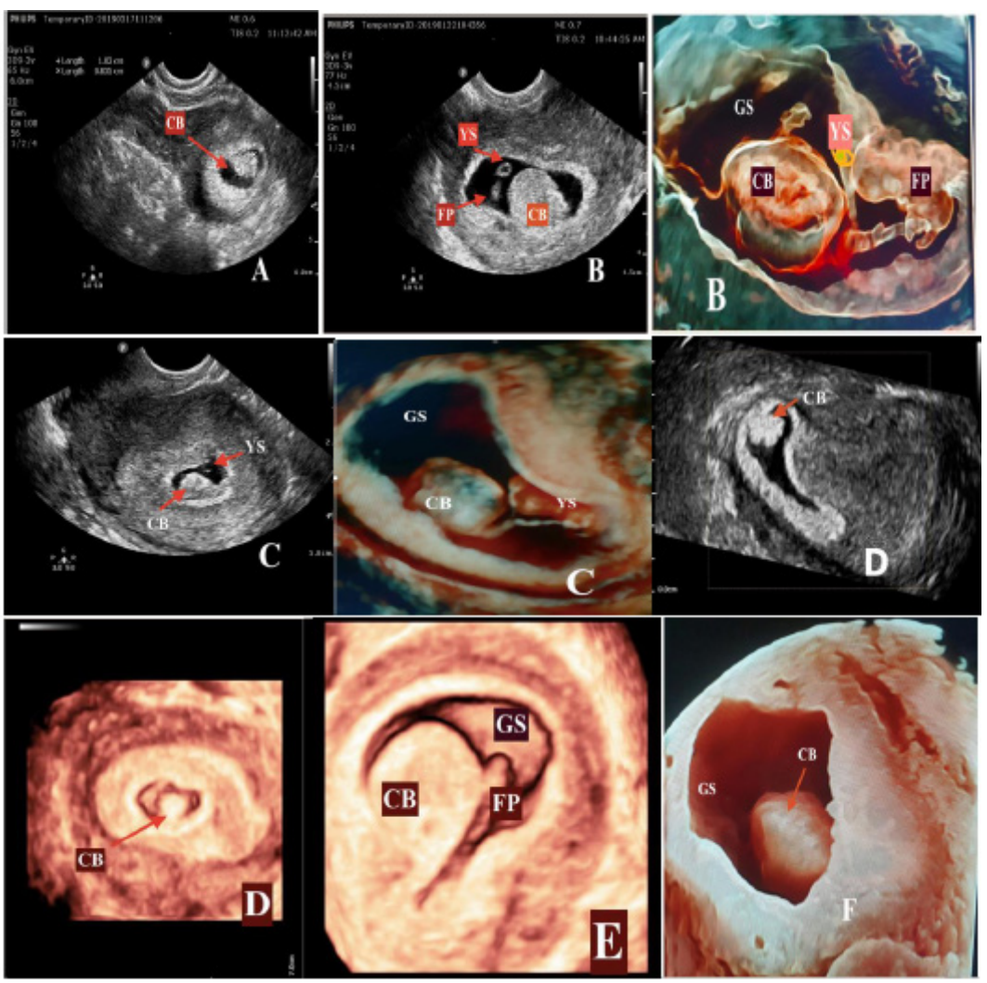

Fig. 3: (A, B, C,c D,d, E, F) 2D transvaginal and their corresponding 3D TVS demonstrate the CB's varying proportions The average diameter of the lesion in its largest dimension ranged in size (maximum dimension) from 0.6 cm to 3.4 cm (average, 2.3 cm), with volumes ranging from 0.5 to 10.8 cm3 (average, 2.7 cm3). It's interesting to note that neither the size nor the location have any bearing on the prognosis for the pregnancy's outcome.

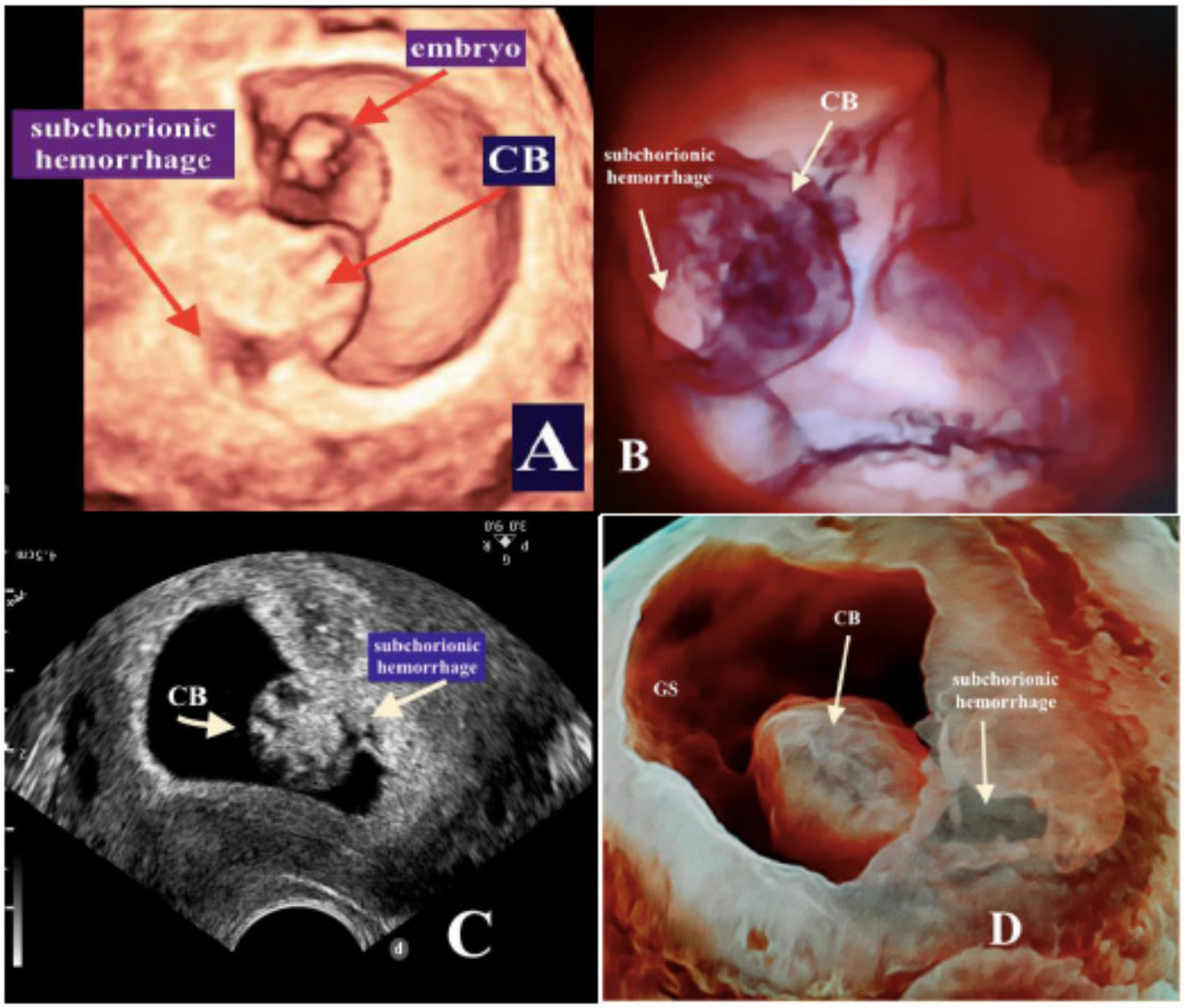

Fig. 4: (4 A, B, C,D) 3d TVS and 2D TVS of early pregnancy show irregular convex protrusion of chriodeciual space into gestational sac; suggestive of the chorionic bump diagnosis, note that also there are subchorionic hematomas, which are heterogeneous lesions measuring 2.8 x 1.1 cm and 1.5 x 0.8 cm and showing no internal flow on color Doppler.

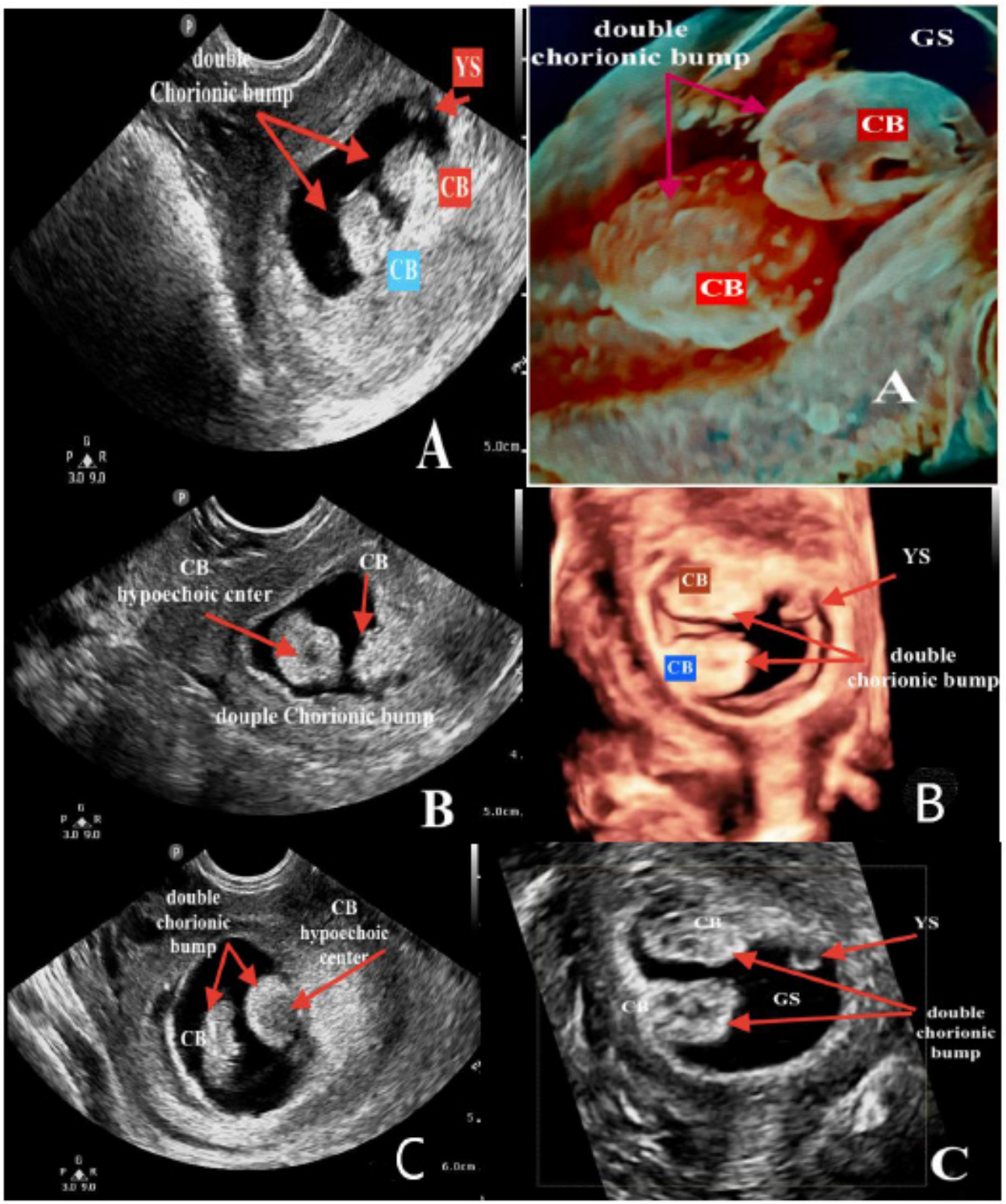

Fig. 5: (5 A,B,C) 2D Transvaginal image and their corresponding 3D TVS; exhibit multiple choriodecidual space protrusions in the gestational sacs, a feature that is suggestive of multiple chorionic bumps. All pregnancies complicated by multiple CB result in pregnancy loss. As a result, the size of CB has a better prediction than its number.

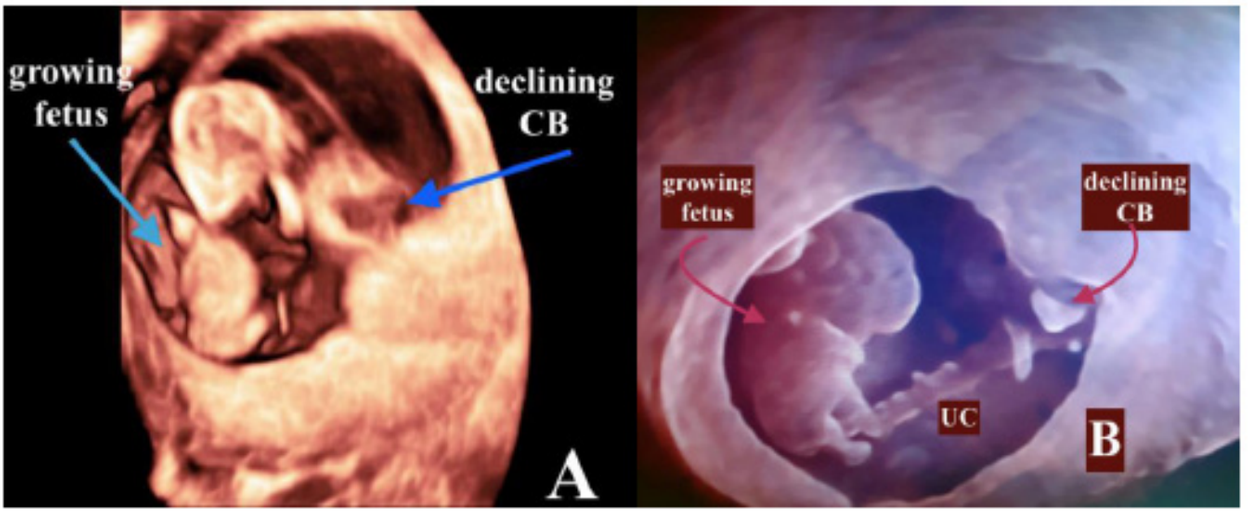

Fig. 6: (6A, B) The size of the CB decreased over the course of three weeks in a fetus that was observed using 3D/4D sonography suggesting that the CB's genesis was a hematoma.

Table 1: Summary of the analysis CB chorionic bump FHR fetal heart rate NVD normal vaginal delivery CS cesarean section

Number	Age of the patient	Gestational age (week +days)	Number of CB	Size of CB	Yolk sac or embryo	FHR	Bleeding	Disappearance time	Parity	outcome
1	22y	8 W	1	14x11x12mm	+	+	+	11 W	G3P1A1 Prev 1CS	Normal term By NVD
2	20 y	6+ 4	1	11x10x9mm	+	+	_	10 W	Pgda	Pre-term By CS
3	23 y	6 W	1	32x26x15mm	+	+	_	16 W	G4P2A1	Normal term By NVD
4	25 y	5+ 2	1	16x15x15 mm	_	_	_	7 W	G3P2A0	Normal term By NVD
5	37 y	10 W	1	33x31x21mm	+	+	+	13 W	G6P5A0 Prev 2CS	Normal term By CS
6	19 y	6 W	2	10x 17x 17 mm 8x8x7 mm	–	–	+	At time of diagnosis	G3P0A2 Prev D&C	Miscarriage
7	22 y	7+ 4	1	15X19X17 mm	+	+	_	13 W	G3P2A1	Normal term By NVD
8	38 y	6 W	2	25X19X17mm 9X9 X10 mm	–	–	+	At time of diagnosis	G6P2A3 Prev 2CS Prev D&C	Miscarriage By D&C
9	27 y	8 W	1	13x13x11 mm	+	+	+	11 W	G5P3A1	Normal term By NVD
10	40 y	11W	2	15X18X17mm 6x5x5 mm	–	–	+	At time of diagnosis	G8P4A3 Prev 3CS	Miscarriage By D&C
11	30 y	10+ 3	1	15X18 X17 mm	+	+	+	18 W	G3P2A1	Normal term By NVD
12	41	9 W	1	32x 27x28 mm	+	_	_	11 W	G8P5A2 Prev 2CS	Miscarriage By D&C

DISCUSSION

The chorionic bump is a rare finding that obstetricians and radiologists may encounter during first-trimester pregnancy ultrasound screening[8]. There aren't many studies on the precise cause of the case[9], but studies have suggested that it might be a hematoma, a small blood aneurysm derived from the placenta, a blighted gestation is being absorbed, or a vanishing embryo in multiple pregnancies, and both sonographic and histological evidence has consistently supported this theory. Baalman *et al*. proposed the mechanism producing chorionic

bumps to be the extensive necrosis of the decidualized endometrium[9].

Due to the low occurrence of chorionic bumps (1.5–7 per 1000 pregnancies)[1,2], it's possible that obstetric imagers aren't familiar with this condition. However; our study found the incidence of chorionic bump 4.5 / 1000 cases. This incidence is lower than previous studies by Harris *et al*. and Arleo *et al*., who reported it as 7/1000 cases[1,4], and consistent with Younesi and R. Shahnazar, who reported it as 4/1000.[10] Yet, it is higher than the incidence reported by Sana *et al*., who reported 1.5 per 1000 cases[2].

The volume of CB fluctuated over time, Following the variations in CB size over time, the majority of cases in our study revealed a reduced CB size over intervals of 3 weeks, which may also be consistent with the theory that CB caused by hematomas. The largest time gaps for CB absence were observed to be 16, and 18, weeks of follow-up, respectively. However, the majority of cases involving CB disappear in the second trimester, which is consistent with the findings of earlier researches[1,2,3,4], and raises the notion that the body can reabsorb the underlying hematoma. Fang, Yunjing, *et al*.'s findings differ from those of Hisham M. *et al*., who reported CB in the third trimester that continues to report a CB until delivery [11,12].

Nonetheless, the number of CB correlates with a poor pregnancy outcome; when there were many chorionic bumps present, the pregnancy ended in miscarriage; similar to Alreo *et al*; who also reported the same result[4]. In our study, the size or position of the bump did not affect the pregnancy outcome; this was consistent with previous study reports[1,2,4,10].

In the meantime, our study observed that pregnancies in which a gestational sac, yolk sac, and embryo with heartbeat were identified" 57% pass to term pregnancy - the pregnancy outcome is not linked with the presence of vaginal bleeding at the time of the initial diagnosis of CB. No other research has identified any links between vaginal bleeding, CB, and pregnancy outcomes, similar to our study[4,10].

There is debate on the frequency of live birth rate data. It is assumed that the existence of a chorionic bulge is linked to poor pregnancy outcomes, while Harris *et al*., postulate a guarded prognosis particularly in the late first and early second trimesters. Silva *et al*. reported a six-fold rise in adverse pregnancy outcomes, mostly carried on by conditions that affect the placenta[13]. Whereas Arleo *et al*. and Sana *et al*. observed a live birth rate of 62% and 65%, respectively, Harris *et al*. reported a live birth rate of fewer than 50%.[1,2,3,4]. According to our research, 66.6 percent (8 of 12) of individuals with chorionic bumps who had them discovered early in pregnancy gave birth to live children. One was a preterm delivery. Three of the four fetal deaths (33.3%) that occurred at the time of the CB diagnosis were abortions. Our study indicated that the diagnosis of CB had no bearing on the choice of delivery method because 75% of births took place by normal vaginal delivery at term and 25% of cases required CS due to linked obstetric reasons, such as a patient who delivered twice by CS.

Interestingly, in our analysis, none of the eight successful cases revealed a baby with apparent birth abnormalities. One preterm infant was admitted to the NICU for a week with a diagnosis of RDS before being discharged home. Seven of the newborns were healthy and full-term. In contrast, because CB is uncommon, the detection of CB and acrania in a case report by Wegrzyn *et al*. may have been accidental and caused by a folic acid shortage or other external factors, which is consistent with all previous research that has not linked CB with a birth abnormality[5].

On the occasion, there are other aspects that have been considered and researched in the past, such as an increased risk of aneuploidy. Josef *et al*. found that while an isolated CB significantly increased the likelihood of aneuploidy in high-risk pregnancies, there was no increased risk of aneuploidy overall[7]. We didn't genetically screen the embryonic product. We did not research CB-related coagulation problems in the same context. As already mentioned, neither Harris *et al*. nor Arleo *et al*. discovered a relationship between coagulopathy and the probability of a live birth[1,4].

We are also conscious of the limitations placed on our research. Our analysis would have done the same in light of prior findings, but the small sample size prevented us from doing so.

CONCLUSION

The aim of this study was to increase knowledge of the unusual chorionic bump experienced during early pregnancy among obstetricians and radiologists. The main finding was that the frequency of CB was 0.45% (4.5 per 1000), which was uncommon first-trimester sonography findings. According to our research, the majority of instances were misdiagnosed and managed incorrectly, leaving patients and their families uncomfortable and apprehensive. Despite the rarity of the finding, it is crucial to diagnose it correctly. Yet, it's comforting to know that 66.6% of patients with chorionic lumps had live births if the pregnancy generally went smoothly. Furthermore, all of the patients in our study who experienced pregnancy failure had several chorionic bumps, suggesting that the prognosis for chorionic bumps is optimistic unless they are multiple. It's interesting to note that none of the cases had birth abnormalities or long-term effects. Because there are few occurrences, it can be difficult to draw firm conclusions. The clinical consequence is that the presence of a chorionic lump on first-trimester sonography might not be as concerning as previously thought, moreover, a larger

multicenter study would be necessary to fully explore its clinical implications.

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CONFLICT OF INTERESTS

There are no conflicts of interest.

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