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Review Article

Large yolk sac: may be a negative factor in the evolution of pregnancy a case and a review of the literature

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Abstract: The yolk sac of the fetus performs important functions for embryonic development during organogenesis. It can be systematically visualized by ultrasound in all live pregnancies of 5 to 10 weeks. It has been reported that a large yolk sac will have a poor prognosis on the course of pregnancy. From this case and a review of the literature we will focus on this phenomenon which is rarely encountered in our current practice.

Keywords: yolk sac, miscarriage, transvaginal ultrasonography.

INTRODUCTION

The yolk sac is the main source of exchange between the embryo and the mother before establishment of placental circulation. It is visualized by endovaginal ultrasound from 5 weeks when the gestational sac exceeds 8 to 13 mm (Levi, C. S. *et al.*, 1988). It increases in size up to 8-11 SA without exceeding 5 to 6mm (Lindsay, D. J. *et al.*, 1992), then disappears after 12 SA (Küçük, T. *et al.*, 1999). The broad yolk sac has vital functions of nutrient exchange that are assumed by the placenta, liver and bone marrow at a later stage (Docherty, S. M. *et al.*, 1996).

Observation

This is a 21-year-old patient with no significant pathological history, G2P1. The first pregnancy is manifested by mole hydatiform for which the patient has benefited from aspiration followed by a quantitative Bhcg rate. Follow-up showed an increase in 3-dose Bhcg, thus concluding a gestational trophoblastic tumor. The disease was scored at 2, hence the decision to start methotrexate-based monochemotherapy at a dosage of 1 mg / kg. A conversion of Bhcg was obtained after 5 courses, with continued follow-up by Bhcg rate. 5 months after the patient is presented with a BHcg 5000 IU, from which the realization of an endovaginal ultrasound revealing the presence of a gestational sac with a 7 SA embryo with positive cardiac activity and a large yolk sac measuring 15mm long axis (image 1 and 2). The progress of the pregnancy was marked by spontaneous miscarriage at 10 weeks. This product is addressed to the anatomopathological study returning to favor a stopped pregnancy without other detectable abnormalities.

Image 1: Ultrasound image showing large yolk sac measuring 15 mm

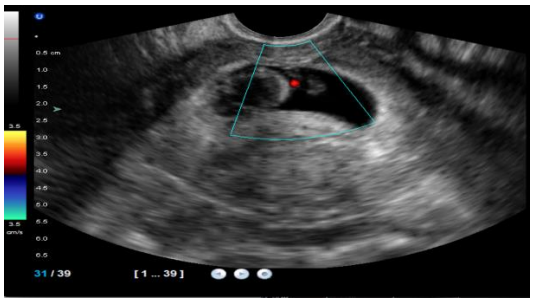

Image 2: Echographic image showing a large yolk sac with an embryo of 7 SA with positive cardiac activity

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DISCUSSION

The yolk sac is an important element in identifying a true gestational sac. It appears in ultrasound as a round structure with an anechoic center and a regular hyperechoic edge. Its diameter is generally between 2-5 mm and increases gradually until the 10 SA to disappear around 12 SA. The diagnosis of a clear egg in transvaginal ultrasound is certain when the average diameter of the gestational sac exceeds 8mm without yolk sac or when it exceeds 16 mm without embryo. While transabdominal ultrasonography clear egg diagnosis is made when the gestational sac reaches 20 mm without yolk sac or 25 mm without embryo (Levi, C. S. *et al.*,1988).

Several studies have investigated the relationship between an abnormal yolk sac either in shape or size and the course of pregnancy. According to Srivastava *et al.* (2016) a large yolk sac is defined by a large diameter greater than 5mm, while a small bag is defined by a large diameter smaller than 2mm.

The study by küçük *et al.*,(1999) in 250 patients, 31 of whom had abnormalities in the size or shape of the yolk sac, found 64% miscarriage in patients with yolk sac abnormalities. That of Adija *et al.*, (2015) Out of 280 patients, 24 of whom had yolk sac larger than 5 mm in diameter, found an 80% miscarriage rate. That of Tan S *et al.*, (2014) of 354 viable singleton pregnancies, 8 of which had a large yolk sac, found a rate of 37.5% and miscarriage. Table 1 includes the majority of the studies as well as the different percentages found.

Table 1: Tables grouping studies showing a relationship between a large yolk sac and miscarriages

studies	Number of patients with yolk sac abnormality	Number of miscarriages	Pourcentage (%)
Küçük (3)	28	20	71,4
Srivastava (6)	7	7	100
Adija (7)	24	19	80
Tan S (8)	8	3	37,5
Berdahl (9)	80	27	34
Fu-Nan *et al.*, (2006)	19	13	68,4
Notre cas	1	1	100

Among the studies best conducted on the subject that of Berdahl *et al.* (2010), it obtains its strength due to the control of other risk factors that may increase the risk of miscarriage in the 1st trimester such as: maternal age, diabetes, high BMI, smokers and polycystic ovary syndrome. They came out with the conclusion that a gestational sac greater than or equal to 5 mm is associated with a 3-fold higher risk of miscarriage in the 1st trimester.

In a large series of 486 cases of Lindsay *et al.*, (1992). They calculated the specificity, sensitivity, and positive predictive value of large yolk sac as an indicator of poor pregnancy outcome; they were 26.9%, 92.7%, and 51.1%, respectively.

The exact etiology of the increased risk of miscarriage associated with a large yolk sac is unclear. Only one study of Cosmi *et al.*, (2005) or a karyotype was performed on the curettage product, the authors concluded that an enlarged yolk sac was a nonspecific finding of failed pregnancy.

From this literature review and our case we concluded that abnormalities in the size or shape of the yolk sac can be used as predictors of a poor progression of pregnancy in the first trimester before any other identifiable abnormality on the ultrasound plan.

CONCLUSION

A large yolk sac seen before the seventh week of amenorrhea is strongly associated with an increased risk of spontaneous miscarriage. Therefore, any pregnancy identified on ultrasound with an enlarged yolk sac should be closely monitored. Other authors (Berdahl, *et al.*, 2010; Gürel, S. A., & Gürel, H. 2000) have also investigated the relationship between a large yolk sac and other pathologies such as soft hydatiforms and the threats of premature labor. Unlike the risk of miscarriage this has not been made clear and further studies will be needed to confirm this relationship.

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