Hyperechoic amniotic fluid in a term pregnancy

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ABSTRACT

The presence of highly echogenic amniotic fluid (AF) is uncommon, and presence creates a dilemma in the mind of the clinician. Echogenic AF has been attributed to meconium, blood, and vernix caseosa. Many studies have shown that the presence of meconium is unlikely in most cases. We report a case of highly echogenic AF detected at 37 weeks which was managed conservatively with careful fetal monitoring for further 2 weeks expecting spontaneous onset of labor. Labor was induced due to reduced fetal movements at 39 weeks. Healthy baby weighing 3130 g was delivered by cesarean section after a failed induction with prostaglandin.

Keywords: Amniotic fluid, hyperechoic, liquor, meconium, term pregnancy

Introduction

Amniotic fluid (AF) is the liquid that surrounds a developing fetus in the amniotic sac and is usually clear to pale yellow in color. AF composition is complex with many maternal and fetal constituents. The composition of the AF changes with the gestational age with an average pH of 7.2 and specific gravity of 1.0069–1.008.[1]

Echogenicity of AF indirectly represents the size, number, and distribution of particles in AF and in turn turbidity of AF. This could give rise to ultrasound detection of echogenic particles, also known as AF sludge or appearance of a homogeneously echogenic AF.[2] AF “sludge” is dense aggregates of particulate matter. In the first and second-trimester ultrasound imaging, the presence of such particulate matter in AF is seen in approximately 4%.[2] It is associated with intraamniotic bleeding and the acrania–anencephaly sequence[1] and also observed in women with higher concentrations of maternal serum alpha-fetoprotein.[4] By the third trimester, the incidence rises to about 80%[3] and have been mainly attributed to the presence of vernix caseosa and/or meconium.[2,5] Vernix caseosa is a complex fatty substance derived from the desquamated epithelial cells and sebaceous material.[6]

Congenital conditions associated with particulate matter in the AF include harlequin ichthyosis and epidermolysis bullosa letalis.[2]

Homogeneously, echogenic AF is due to the presence of innumerable echogenic particles in the fluid and is an uncommon finding. In most cases this is due to the presence of vernix caseosa in AF, however, in minority of cases, this could be due to meconium.[5-9]

Case Report

A 34-year-old primigravida was detected to have hyperechoic AF in a routine growth scan at 37 weeks of gestation [Figure 1]. She had an uncomplicated antenatal period. The fetal growth was satisfactory, and AF Index and the umbilical artery blood flow indices were within the normal range. Fetal movements were satisfactory, and cardiotocography was normal. In the absence...
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of further complication pregnancy was continued expecting spontaneous onset of labor.

AF remained hyperechoic, and induction of labor was done at 39 weeks using one cycle of prostaglandins since the patient complained of reduced fetal movements. The cervix was not favorable for induction and the second cycle of prostaglandin was declined by patient and a cesarean section was performed. Healthy baby boy weighing 3130 g was delivered with normal Apgar scores at 5 and 10 min. The AF at delivery was turbid in appearance [Figure 2]. Microscopic evaluation of the AF revealed vernix and the culture was negative.

Discussion

This case report documents hyperechogenic AF detected on ultrasound in the late third trimester without any adverse effect in the neonate. Hyperechogenic AF was detected at 37 weeks, and the pregnancy was managed conservatively with careful monitoring until 39 weeks. Induction of labor was attempted in view of reduced fetal movements. Hyperechogenic AF is an uncommon finding that is commonly due to the presence of vernix, though in some cases, it is associated with the presence of meconium or blood creating a dilemma for management of these patients.[7-10]

Review by Sepúlveda and Quiroz indicated that the finding of hyperechoic AF refers more often to a considerable amount of vernix rather than meconium.[10] However, they suggested amniocentesis or amnioscopy to rule out the presence of meconium.[10]

A retrospective study by Brown et al. described that very echogenic AF during the third trimester as an unreliable indicator of meconium or blood in AF.[9] Nineteen such cases were investigated with amniocentesis. One case of meconium (5%) was detected and the remaining 95% had vernix.[9] Similarly, Petrikovsky et al. prospectively studied 19 cases of twin pregnancies, each with one amniotic sac containing echogenic AF and the other containing anechoic AF.[7] Only one case (5%) of meconium detected in the echogenic group compared to 4 (21%) in the anechoic group.[7] Further, a prospective study by Sherer et al. concluded that hyperechoic AF had sensitivity of 100%, a specificity of 69% and a positive predictive value of 10%, and a negative predictive value of 100% to detect meconium in AF.[8] However, we have serious concerns regarding the methodology of this study.

In the initial reports, where echogenic amniotic fluid had been diagnosed by ultrasonography, further evaluation by amniocentesis or amnioscopy was recommended.[10] Amniocentesis is also not without risk, as it may give rise to infections and induce labor or result in miscarriage. It should be noted that ultrasonography cannot reliably differentiate meconium in AF from other causes of hyper-echogenicity. If meconium could have been reliably identified prenatally, then it may have a significant impact on the neonatal outcome. Recent studies and case reports reveal that ultrasonic finding of a echogenic AF at term in a normal pregnancy has no significant association with meconium and adverse pregnancy outcomes.[7-9] Therefore, a change in the management of pregnancy cannot be justified simply due to detection of hyper-echogenic AF.

In the index case, hyperechogenicity of AF was due to the presence of vernix. When the clinical, nonstress test and biophysical profiles are reassuring, the mere presence of hyperechogenic AF in ultrasound imaging cannot be considered as a marker of meconium and fetal distress. Therefore, this case also emphasizes that routine prenatal management of pregnancy should not be altered in the mere presence of hyperechogenic AF.

Declaration of patient consent

The authors certify that they have obtained all appropriate patient consent forms. In the form the patient(s) has/have given his/her/their consent for his/her/their images and other clinical information to be reported in the journal. The patients understand that their names and initials will not be published and
due efforts will be made to conceal their identity, but anonymity cannot be guaranteed.

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Conflicts of interest
There are no conflicts of interest.

References
1. Pillitteri A. Maternal & Child Health Nursing: Care of the Childbearing & Childrearing Family. 7th ed. Philadelphia, PA: Lippincott Williams & Wilkins; 2007. p. 193.
2. Johnson MP, McCarty DR, Velayo NL, Markgraf CG, Chmielewski PA, Ficorilli JV, et al. MDL 101,002, a free radical spin trap, is efficacious in permanent and transient focal ischemia models. Life Sci 1998;63:241-53.
3. Cafici D, Sepulveda W. First-trimester echogenic amniotic fluid in the acrania-anencephaly sequence. J Ultrasound Med 2003;22:1075-9.
4. Hallak M, Zador IE, Garcia EM, Pryde PG, Cotton DB, Evans MJ, et al. Ultrasound-detected free-floating particles in amniotic fluid: Correlation with maternal serum alpha-fetoprotein. Fetal Diagn Ther 1993;8:402-6.
5. Tam G, Al-Dughaihi T. Case report and literature review of very echogenic amniotic fluid at term and its clinical significance. Oman Medical J 2013;28:461-3.
6. Hill LM, Breckle R. Vernix in amniotic fluid: Sonographic detection. Radiology 1986;158:80.
7. Petrikovsky B, Schneider EP, Gross B. Clinical significance of echogenic amniotic fluid. J Clin Ultrasound 1998;26:191-3.
8. Sherer DM, Abramowicz JS, Smith SA, Woods JR Jr. Sonographically homogeneous echogenic amniotic fluid in detecting meconium-stained amniotic fluid. Obstet Gynecol 1991;78:819-22.
9. Brown DL, Polger M, Clark PK, Bromley BS, Doubilet PM. Very echogenic amniotic fluid: Ultrasonography-amniocentesis correlation. J Ultrasound Med 1994;13:95-7.
10. Sepúlveda WH, Quiroz VH. Sonographic detection of echogenic amniotic fluid and its clinical significance. J Perinat Med 1989;17:333-5.