



# Center For Advanced Fetal Care Newsletter

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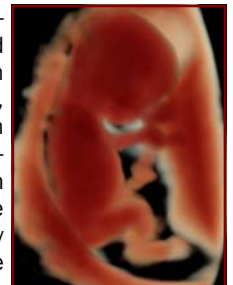
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## Beyond the Shadow of Any Doubt...

...the future of ultrasound is so incredibly bright...And as such we dedicate this issue, CFAFC's 10th Newsletter, to this most versatile of imaging modalities. With its **portability**, **availability**, **versatility**, **effectiveness** and **safety**, ultrasound **paves** the way to 'sound judgment' and optimizes clinical management across many disciplines and at all point-of-care settings. And on March 22, the American Institute of Ultrasound in Medicine (AIUM) launched 'Ultrasound First' ([www.ultrasoundfirst.org](http://www.ultrasoundfirst.org)), a multifaceted approach to expand the use of ultrasound as the 'first' modality across many disciplines. In parallel, the Journal of Ultrasound in Medicine (JUM) introduced the 'Sound Judgment' series to cover key areas where ultrasound may be used as a first line diagnostic modality with much evidence-based diagnostic confidence. With this 10th issue, we share with you Abdallah et al's call to redefine the sonographic criteria for safer diagnoses of miscarriage, we present a third trimester ominous finding, the late visualization of the hyaloid artery, and we present highlights from the AIUM's annual convention held in Phoenix. In addition, we share with you a new 3D technique for the evaluation of the fetal palate, present Karl et al's hot-off-the-press paper on the value of measuring the fetal BPD in the first trimester, together with our traditional quarterly features...At the selfsame instant, we caution against the mishandling of this most powerful of technologies. With the mishandling of today's inherent sonographic capabilities, much damage may be inflicted by concentrating on the 'pretty face' and not looking beyond. The superiority and safety of this modality is safeguarded by the adherence to the guidelines and the employment of the 'as low as reasonably achievable' (ALARA) principle. This being fulfilled ensures 'sound judgment', beyond the shadow of any doubt...



Shadow of a 13w3d Hand at CFAFC Using HDlive



Silhouette of a 12w4d Fetus at CFAFC Using HDlive

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## Redefining Sonographic Criteria for Diagnosing Miscarriage

One of the most important roles of ultrasound in early gestation is ascertaining fetal viability. As such, the group of Abdallah et al carried out a prospective multicenter observational study, on 1006 intrauterine pregnancies of uncertain viability (IPUV), in an attempt to define cut-offs for mean sac diameter (MSD), or crown rump length (CRL) growth, in order to ascertain fetal viability (Ultrasound Obstet Gynecol 2011; 38: 503-309). The authors found 1/200 viable pregnancies in those with an empty sac of a MSD > 20mm and a false positive rate of 4.4% for an empty sac with a MSD > 16mm. In addition, the authors found overlap in the MSD growth between viable and nonviable IPUV and could not identify a MSD below which fetal viability could be ruled out. However, a cut-off value of CRL growth of less than 0.2mm/day, and an empty sac on 2 visits 7 days apart, was always associated with miscarriage. This calls for redefining our previously used cutoffs of diagnosing a nonviable pregnancy in case of an empty sac of a MSD > 20mm (or > 16mm in certain countries) and a minimum CRL growth of 1mm/day. The authors conclude that caution must be exercised in cases of IPUV without haste in diagnosing a missed abortion.

## Visible Hyaloid Artery in the Third Trimester: a Pathologic Sign

With the ever improving resolution of today's sonographic machines, we are enabled to visualize various fetal structures with more clarity as in the case of the fetal hyaloid artery. This was recently addressed by Spiaggiari et al in Ultrasound Obstet Gynecol 2012; 39: 478-481 in which the author reports that the hyaloid artery normally disappears between 23-28 weeks and should not be visible beyond 29 weeks. If it were to remain present, it may signify underlying pathology as in hyperplastic primary vitreous (PHPV). The case of a 30 year old referred for IUGR, which was confirmed, is presented. The presence of hyperechogenic kidneys and a visible hyaloid artery were detectable at 30 weeks. Infectious workup as well as evaluation for aneuploidy were all negative. The hyaloid artery remained visible at 32 weeks and the couple terminated the pregnancy. Postmortem evaluation confirmed renal microcysts, IUGR, a persisting right hyaloid artery with associated cataract. The author cautions about the importance of a thorough evaluation of a fetus with a persisting hyaloid artery beyond 29 weeks and the need for a multidisciplinary team approach.



Visible Hyaloid Artery at 22w6d

## Select Abstracts from the American Institute of Ultrasound in Medicine's Annual Convention March 29–April 2, Phoenix - AZ



The AIUM held its annual convention in Phoenix, Arizona where more than 1300 delegates gathered for 4 intense days of didactic as well as hands-on sessions covering the use of ultrasound across all disciplines. In addition, electronic and oral abstracts addressing cutting-edge research in the specialty were presented. Select abstracts are included here and the complete Convention's Proceedings are available at: <http://www.aium.org/publications/proceedings/proceedings.aspx>

### **Sonographic Evaluation of Abnormal Patterns of Cerebral Lamination in CMV Infection. Pugash et al.**

This is a descriptive study on 6 fetuses with confirmed CMV infection exhibiting sonographically-detectable abnormal changes in cerebral lamination. In two of the fetuses, there was focal inhomogeneity as well as a notably increased echogenicity of the intermediate zone which occurred prior to detectable microcephaly, ventriculomegaly as well as cerebral calcifications. In the remaining 4 fetuses, there was abnormal persistence of a laminar pattern as well as abnormally increased prominence and echogenicity of the intermediate zone. The authors conclude that sonographically detectable abnormal patterns of cerebral lamination may signal underlying pathological brain development.

### **First Trimester NT Screening vs NT + Anatomic Survey. Does it Make a Difference? DeVore & Polance.**

This study involves 2412 consecutive singleton pregnancies undergoing first trimester screening by transabdominal as well as transvaginal scan. The fetuses underwent a full anatomical survey and power Doppler was utilized to evaluate the four chamber view as well as the outflow tracts. The fetuses were then divided into 2 groups based on whether the NT was  $< 3$  or  $\geq 3$  mm. There were 53 cases of abnormal fetal findings out of which 26 were considered major fetal malformations. Of notable interest is that of the 53 cases, 41 occurred in the group with an NT  $< 3$  mm, and of the 26 major malformations, 19 occurred in that same group. The authors conclude that a full anatomical survey should be undertaken at the time of NT assessment irrespective of the size of the

### **Prenatal Diagnosis of Fetal Echogenic Lung Lesions: 6-Year Experience at a Tertiary Care Center. Tice et al.**

This was a retrospective review of 172 fetuses with echogenic lung lesions on whom postoperative records, autopsy records as well as a 12 month postnatal follow-up were available. Of those, 3 had high congenital airway obstruction, 104 with cystic adenomatoid malformation (CCAM) and 65 pulmonary sequestration (PS). The majority were detected in the late second and early third trimesters. 13.3% had other anomalies. Nearly half the cases of CCAM (53%) and a third of the PS (37%) spontaneously resolved antenatally. Hydrops fetalis occurred in 6/104 CCAM and in 4/65 PS there was pleural effusion. There were 2 terminations, 2 in-utero demises and 168 live births. 19 neonates required ECMO. 154 babies were alive at 12 months. The authors conclude that the development of hydrops, a large lesion size with severe midline shift and diaphragmatic distortion are poor prognosticators.

### **Isolated Short Femur Length on Midtrimester Ultrasound: a Marker for IUGR & Other Adverse Perinatal Outcomes. Goetzinger et al.**

The authors hypothesize that an isolated short femur (FL) at midgestation may be a sign of placental dysfunction, hence the aim of their study was to investigate the association between a short femur at midtrimester and intrauterine growth retardation (IUGR) as well as other adverse perinatal outcomes. This was a retrospective study in which fetuses with aneuploidy and congenital malformations were excluded. Those with a FL  $< 10\%$  were included and they constituted 569/73884 cases (0.8%). Of those, 268 (47.1%) were isolated. Another 210 (0.3%) had a FL  $< 5\%$  of which 34 (16.2%) were isolated. Isolated short FL was associated with IUGR (more than 3 fold increase) and preterm delivery but not preeclampsia. The authors conclude that in case of an isolated short FL, serial growth fetal assessment is indicated.

### **Borderline Amniotic Fluid Volumes Do Not Forewarn Fetal Intolerance of Labor. Newton et al.**

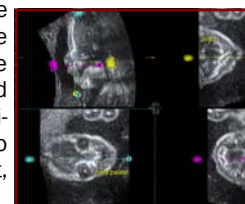
The aim of the study was to determine whether a third trimester amniotic fluid index (AFI) of  $< 5$  or  $> 10$  was associated with any signs of fetal compromise. This was a retrospective study powered to detect an increased risk of cesarean section (CS) in women with an AFI  $< 5$  mm versus a normal AFI. There were 81 patients with an AFI  $< 5$  mm and 266 with a normal AFI. The authors report no statistically significant effect of an AFI of  $< 5$  on the rate of meconium stained fluid, non-reassuring fetal heart tracing (NRFHT), CS or CS for a NRFHT. However, there was a statistically significant increase for NICU admission, with a ratio of 1.751 that was lost when gestational age at delivery was taken into account. The authors conclude that the increase in NICU admissions may be related to preterm delivery (PTD) which warrants further study to investigate whether there is an association between borderline AFI

### **@EDUltrasound: a Social Media Curriculum. Bahner et al.**

A novel, futuristic study evaluating the utility of social media, Twitter, in pushing educational pearls to mobile devices. This was a year-long program in which a 140-character tweet, from a high-yield ultrasound concepts' curriculum, was pushed daily to 87 followers on Twitter and 78 on Facebook. The majority (55%) had never used Twitter. 88.9% found Twitter user-friendly and 81.5% found the information useful. At a followup survey, there were 101 followers on Twitter and 78 on Facebook. The authors conclude that Twitter has the potential to complement today's traditionally available educational tools.

## CFAFC's Technical Recommendation: OmniView Algorithm, a Novel 3D Technique in the Study of the Fetal Hard and Soft Palate

There have been many techniques described over the years on how to maximize the utility of volume sonography in the evaluation of the fetal hard and soft palates for the prenatal diagnosis of facial clefts. Nonetheless, evaluation of the palate remains a diagnostic challenge with suboptimal prenatal diagnostic rates especially when the lip is intact. As such, a most recent technique, the OmniView algorithm, has been described by Tonni et al (J Ultrasound Med 2012; 31:313-318). What is unique about OmniView is that it allows the simultaneous display of 3 non-orthogonal planes. For applying this technique, the fetus needs to be in a mildly flexed position, avoiding any cord, placenta or extremities in front of the face, and ideally with fluid in the oropharynx. Subsequently, a 3D volume is obtained in the 'skeleton mode' spanning the crown to chin area. The OmniView algorithm is then employed utilizing 3 polylines: the first line drawn from the posterior aspect of the palate down to the chin shows the labia, alveolar ridge and the uvula (which has the appearance of the equals sign). The presence of the uvula indicates an intact palate. The second line is defined by the anterior and posterior nasal spines and the tip of the uvula. It demonstrates the labia and alveolar ridge. The third line is drawn vertically behind the frontal bone all the way down to the chin, 'reverse mode', and it demonstrates the hard palate and tongue. The authors conclude that this technique has a limited learning curve and may improve the suboptimal diagnostic rates of cleft palate. Nonetheless, as the authors clearly state, only prospective studies will be able to show whether applying the OmniView algorithm might translate into enhanced prenatal detection rates of facial cleft, particularly in the cases where there is an intact lip.



## THIS AND THAT

### Ultrasound First



The AUIM has just launched a unique initiative 'Ultrasound First' in order to substantiate the unique sonographic features making this diagnostic modality the 'first choice' when it comes to imaging across disciplines. More information as well as clinical evidence is available on [www.ultrasoundfirst.org](http://www.ultrasoundfirst.org).

### Annual Congress FMF

The 11th World Congress of the Fetal Medicine Foundation is to be held on the Island of Kos (Hippocrates' birthplace) in Greece June 24-28. Abstract submission is available until May 31, 2012. As has become customary, a most rigorous congress, coupled with Eurofetus, addressing cutting edge research, and how it pertains to the future of fetal and maternal care, has been planned. Attendees should expect sessions lasting well into the late night hours, but it will undoubtedly prove to be another most stimulating congress. For information visit: [www.fetalmedicine.com/fmf/courses-congress/conferences/](http://www.fetalmedicine.com/fmf/courses-congress/conferences/).

### Recommended App

A newly updated and handy App is 'Urgent Ob' which covers a multitude of obstetrical emergencies, from diagnosis to management. Sample topics include ACLS, preterm labor and tocolysis, preeclampsia, first and second trimester bleeding, operative vaginal delivery, post partum hemorrhage to name a few. This App may be critical in outreach and other settings with no readily available references.

### Sound Judgment



Coupled with the 'Ultrasound First' initiative, the Journal of Ultrasound in Medicine has introduced the 'Sound Judgment' series, starting with the February 2012 issue, which addresses and presents scientific evidence as to the superiority of ultrasound over other radiologic modalities in the diagnosis and confirmation of various conditions across the disciplines, in addition to its safety, cost effectiveness and affordability. These articles are available for free download from the 'Clinical Evidence' section on the [www.ultrasoundfirst.org](http://www.ultrasoundfirst.org) website. To date, articles relevant to Ob/Gyn address the role of ultrasound in postmenopausal bleeding, in the diagnosis of endometriosis as well as in the diagnosis of adenomyosis.

### Hot-Off-The-Press: Small BPD of Fetuses with Spina Bifida at 11-13 Weeks and at Midgestation. Karl et al. Ultrasound Obstet Gynecol; Ahead of Print, Accepted Online 18 April 2012.

Several first trimester (FT) markers have been introduced for FT screening and for the early detection of spina bifida, namely the intracranial translucency, the evaluation of the posterior fossa and the frontomaxillary facial angle. And now, in this retrospective study, the group of Karl et al address the role and recommend measuring the fetal biparietal diameter (BPD) at 11-13 weeks, which is known to be small in the fetuses with spina bifida in the second trimester, as a simple to use and easy new FT marker. This was a multicenter retrospective study on 23 fetuses with open spina bifida all diagnosed at 16-24 weeks, who had a BPD measured at the time of NT assessment at 11-13 weeks. BPD z-scores at 11-13 weeks and at 16-24 weeks were found to be significantly lower than the established reference range with a p of < 0.0001. Interestingly, there seemed to be a greater lag of the BPD with advancing gestation where 26% of fetuses with open spina bifida had a BPD < 5% at 11-13 weeks, in comparison to 69% of those fetuses at mid gestation. The authors attribute this to continued leakage of cerebrospinal fluid. The authors thus conclude that this reduction of cerebrospinal fluid results in a small BPD (< 10%) and though this is not a very specific marker for open spina bifida, it is one of the easiest parameters to measure in the FT and is a potential subtle early marker for open spina bifida.

### Xth Makassed Annual Meeting



The Xth annual meeting of Makassed Hospital is planned for mid July in Beirut. Please mark July 14 on your calendars as it shall be dedicated to high risk Obstetrics. World-renowned experts in the field, together with local distinguished speakers, will be covering the latest updates pertaining to women's health.

### CFAFC News



CFAFC's Reem S. Abu-Rustum has been recognized by the British Journal of Obstetrics and Gynecology as a 'Top Reviewer' and as a 'Distinguished Reviewer' by the Journal of Ultrasound in Medicine for the year 2011. She has been invited to serve on the Editorial Advisory Board of the Journal of Ultrasound in Medicine.



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CFAFC would like to thank Dr. Mazen Hatem and Dr. SaadEddine Itani for their contributions to this issue. In addition, CFAFC wishes to extend a special acknowledgement to the AIUM, its leadership as well as to JUM for having served as the true inspiration behind this 10th issue...



For any interesting case reports, comments, suggestions or announcements to be included in our newsletter, please send an e-mail to [rar@cfafc.org](mailto:rar@cfafc.org).

## A Vanishing Fetal Abdominal Mass By Mazen Hatem, MD

A 30 year old G2P1, with a negative past history, presented at 21 weeks for a genetic scan. The anatomical survey was normal except for an approximately 2 cm mass noted in the upper left fetal abdomen that was vascular on color Doppler (Figure 1). Serial scans were then carried out at 23w5d (Figure 2), 26w5d (Figure 3) and 33w2d (Figure 4) during which an increase in the size and color flow of the mass were noted. It was separate from the adrenal gland and the kidney but was abutting the descending aorta. In addition, the borders were becoming less distinct. Fetal growth and amniotic fluid index remained normal. The differential diagnosis included an adrenal mass, neuroblastoma, teratoma nephroma or a subdiaphragmatic extralobar sequestration. However at 34w5d a decrease in the size of the mass was noted with complete resolution of the mass at 39w3d (Figure 5). The patient went on to have a term livebirth of a 3300 gram healthy male. Postnatal ultrasound of the fetal abdomen was perfectly normal. Neuroblastomas are the most common tumors in the neonatal period. They can be detected antenatally and there have been reports of spontaneous resolution. Though no fetal MRI was done and no tissue diagnosis is available, given the evolution and regression of this mass makes neuroblastoma the most likely diagnosis. The fetus is alive and well at 24 months now.



Figure 1



Figure 2



Figure 3



Figure 4

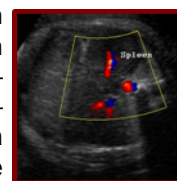


Figure 5

## Upcoming Congresses

COURSE TITLE	DATES	LOCATION	WEBSITE ADDRESS
8th International Symposium of ISUOG	May 31-June 3, 2012	New Delhi, India	<a href="http://www.isuogsymposiumindia.com">www.isuogsymposiumindia.com</a>
Advances in 3D/4D Ultrasound	June 1-3, 2012	Atlanta-GA, USA	<a href="http://www.iame.com/conferences/advances_3d_4d_ultrasound/">www.iame.com/conferences/advances_3d_4d_ultrasound/</a>
16th International Conference of the International Society of Prenatal Diagnosis	June 3-6, 2012	Miami-FI, USA	<a href="http://www.ispdhome.org/conference/2012">www.ispdhome.org/conference/2012</a>
Perinatal Medicine 2012	June 13-16, 2011	Paris, France	<a href="http://www.mcaevents.org/ecpm2012/">www.mcaevents.org/ecpm2012/</a>
11th World Congress in Fetal Medicine	June 24-28, 2012	Kos, Greece	<a href="http://www.fetalmedicine.com/fmf/courses-congress/conferences/">www.fetalmedicine.com/fmf/courses-congress/conferences/</a>
Xth Makassed Annual Congress	July 12-14, 2012	Beirut, Lebanon	<a href="http://www.almakassed.org">www.almakassed.org</a>
22nd Annual Congress of ISUOG	September 9-12, 2012	Copenhagen, Denmark	<a href="http://www.isuog.org/WorldCongress/2012/">www.isuog.org/WorldCongress/2012/</a>
Fetal Echocardiography: Normal & Abnormal Hearts	October 12-13, 2012	Las Vegas-NV, USA	<a href="http://www.edusymp.com/meetingview.asp?productid=5121">www.edusymp.com/meetingview.asp?productid=5121</a>