



Center For Advanced Fetal Care Newsletter

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Creativity...

...Unchains us. Thrills us. Exhilarates us. It enables freeing the mind and removing all restrictions... Over the past few months, world events have driven us to a “**status epilepticus**”. This tonic-clonic state has led us to the point of no return and shall ultimately prove fatal. What we need is “**pavlovian conditioning**” using a creative reward system. Our only salvation is to allow our collective human creativity to take control and rescue us from annihilation. We must focus on what unites us as a race: pain and pleasure; **art in all its forms**. We must **rise above** our differences and handicaps, unravel the universe’s **mysterious effects** on our genome, and understand the effects of **propagating the bloodline** on the female brain. We thus dedicate this issue to “creativity”, that which is within each and every one of us to varying degrees, and the triggers that allow us to unleash it. We present the latest from the Fetal Medicine Foundation and the Society of Maternal Fetal Medicine’s recent congresses with their cutting-edge research. We review for you the effect of congenital heart defects on the developing cortical brain. We go back to the basics and the continued role of measuring the symphysis-fundal height. We bring you the latest guidelines from ACOG on obstetrical sonography and review for you the latest basic, yet most comprehensive text on ultrasound in obstetrics and gynecology. We hope that with this issue, commencing our 8th year, we are able to penetrate into the depth of your psyche in order to set your creativity free...



Elbphilharmonie, Hamburg



Refractory Status Epilepticus

Brain Cortex Development in Congenital Heart Defects

Peng et al evaluated the effect of congenital heart defects (CHD) on fetal brain gyration in their recently published article in **JUM**. In their study, the authors measured the depth of the Sylvian fissure, parieto-occipital and calcarine fissures sonographically at 20-25 weeks on 45 normal fetuses and 45 fetuses with CHD. In addition, fetal cardiac hemodynamic parameters, namely aortic and pulmonary valve diameters, aortic and pulmonary valve velocity time integrals, were recorded. Subsequently, correlations between the prenatal depth of the fissures, the prenatal hemodynamic parameters and the postnatal neurodevelopmental scores at 6 months of age were made. There was a statistically significant decrease in the depth of all fissures in fetuses with CHD ($P < 0.01$). The small fissure depths in fetuses with CHD correlated with decreased left heart hemodynamic parameters. There was a statistically significant correlation between the depth of the Sylvian fissure and the postnatal neurodevelopmental scores ($P < 0.01$). The authors conclude that fetal brain maturation, as reflected by the sonographic depth of the Sylvian, parieto-occipital and calcarine fissures, may be assessed at the time of the routine obstetrical scan, particularly in fetuses with CHD.



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International Standards for Symphysis-Fundal Height

As sophisticated as technology has become, as invaluable as it still is to measure the symphysis-fundal height (SFH) in order to screen for fetal growth abnormalities, particularly in the limited resource setting. In their recently published article in **BMJ**, Papageorghiou et al carried out a prospective longitudinal observational study on 4607 healthy well-nourished women who were enrolled in the Fetal Growth Longitudinal Study component of the INTERGROWTH-21st Project. The study was carried out in 8 different urban geographical locations: Brazil, China, India, Italy, Kenya, Oman, United Kingdom, and the USA. As expected, SFH measurements increased linearly with advancing gestation and the best fitting curves were established for the SFH from measurements taken at 5 week intervals and commencing at 14 weeks of gestation. As a result, we now have international standards for SFH measurements. This further validates the role of the SFH as an inexpensive, simple and effective first line screening modality for fetal growth disturbances.



Highlights from the Fetal Medicine Foundation's Annual Course "Advances in Fetal Medicine" Held December 3 - 4, 2016 at UCL in London, UK. By Salma Jabak, MD

The **Fetal Medicine Foundation**, headed by Professor Nicolaides, held another "Advances in Fetal Medicine Course" to a record attendance of approximately 1100 attendees.

The first day covered diverse topics. Professor Nicolaides commenced with a presentation on prediction and prevention of preterm birth. He shed light on the historical facts whereby obstetricians today still fail in identifying preterm deliveries 84% of the time. Subsequently, Lesley Regan, the first female obstetrician to be elected as the president of the RCOG, gave a very elaborate lecture entitled "Human Rights and Women's Health".

The day continued with several international presenters, from Europe and Canada, who discussed the clinical implementation of 1st trimester screening and cfDNA in the various regions of the world today. Allan Bombard, Francesca Grati and Yves Ville gave concise presentations in support of multigene carrier screening, specifically the 22q11.2DS syndrome. Then Ranjit Akolekar and Asma Khalil discussed stillbirth in singleton and twin pregnancies. The day ended by another marvelous presentation by Professor Nicolaides on the prediction of preeclampsia where the soon-to-be-published ASPRE study results were announced. A most memorable evening ensued where all attendees were invited to a Jazz Night at the New Harris Birthright Building in Windsor Walk.

Day 2 commenced with presentations on different fetal cardiac defects where various fetal cardiac anomalies were presented along with criteria for diagnosis, prognosis and counseling. Then the gears shifted to the nervous system where Ritsuko Pooj and Magda Sanz gave two lectures on neurosonography and fetal MRI. Subsequently, Oliver Kagan gave an elaborate lecture on maternal CMV infection in pregnancy. In addition, Surabi Nanda presented select challenging maternal fetal medicine cases, and Anca Panaitescu discussed autoantibodies and fetal defects in pregnancy. The course concluded with presentations on the latest in fetal surgery by Yves Ville, Francisca Mollina, Denise Pedreira and Nicola Persico.

Mark your calendars for the upcoming **16th World Congress in Fetal Medicine** planned for June 25 - 29, 2017 in Ljubljana, Slovenia. Details on the **FMF Website**.



Prediction of Preterm Birth



Prediction of Preeclampsia

Highlights from the Society of Maternal Fetal Medicine's "The Pregnancy Meeting" Held January 23 - 28, 2017 at Caesar's Palace in Las Vegas, Nevada

Over 2500 specialists from all over the world gathered at the Caesar's Palace in Las Vegas for the **SMFM's Annual Pregnancy Meeting**. This was one of the SMFM's most memorable congresses with over 2130 abstracts submitted and 940 (46%) of those were accepted. In addition, there was a total of 12 post graduate courses, 19 scientific forums and 12 luncheon roundtables.

Day 1 included a comprehensive course on Prenatal Genetics. It was given by leaders in the field namely Drs. Bianchi, Dugoff, Norton and Wapner among others. The day unveiled the latest in prenatal genetics: from the up and coming role of whole exon sequencing to the role of NIPT in the detection of maternal malignancies: the future is most promising!

Day 2 featured a joint SMFM/ISUOG course which was live-streamed around the globe. Key lecturers were Drs. Bromley, Copel, Feltoich, Papageorghiou and Platt. The importance of the 11-14 week anomaly scan in the era of cfDNA was highlighted. In addition, the role of genetics in cardiac malformations, latest in cervical screening and the just released WHO growth charts were presented. **ISUOG** members will have access to the course using **OnDemand** in the near future.

Day 3 commenced with several morning courses prior to the afternoon's numerous Scientific Forums. Among them was the NAFTNet Fetal Therapy Course where the latest in in-utero managements of MMS, sacrococcygeal teratoma, critical aortic stenosis and TTTS was presented by Drs. Crombleholme, Emery, Moldenhauer and Wilkins-Huag. Subsequently the Scientific Forums ensued with a distinguished Fetal Echocardiography forum given by Drs. Abuhamad, DeVore and Morris where 5 key anatomic regions of the fetal heart, cardiac functional assessment and the impact of prenatal diagnosis were beautifully presented.

Days 4 was the opening plenary session with the top 10 abstracts presented and where Dr. Dennis Lo gave an outstanding talk on the future of noninvasive prenatal testing. He took us well into the future with his vision of "pushing forward the limit of prenatal testing" with promised enhanced resolution and the potential for the detection of de novo fetal mutations.

Days 5 and 6 were packed with the remainder of the 115 oral abstract presentations on every imaginable aspect of maternal and fetal medicine from basic science to the bedside. There were exciting discussions at the poster sessions and a massive exhibit from the industry with the latest sonographic machines on display.

SMFM 2017 shall go down in memory with ramifications on so many aspects of our lives for years to come. Looking forward to SMFM 2018 in Dallas!



Mary Norton, MD



Dennis Lo, MD

CFAFC Recommends Chudleigh et al's Obstetrical & Gynaecological Ultrasound: How, Why & When 4e

The 4th edition of **Obstetrical & Gynaecological Ultrasound: How, Why & When** was just released. It is edited by Chudleigh, Smith and Cumming and is available in both print and digital formats.

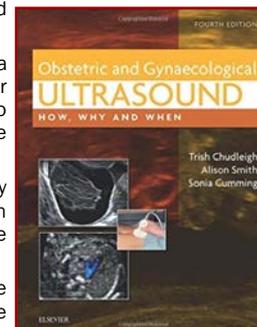
This beautifully illustrated text is made up of 16 chapters that cover every aspect of scanning. Each chapter commences with a summary table of the key topics addressed within the chapter. The first 4 chapters cover the principles of 2D, 3D and Doppler ultrasound. They address how to prepare the patient for the scan and how to select the proper probe and settings while adhering to safe ergonomics. The transabdominal and transvaginal routes of scanning are extensively reviewed with a special attention to probe manipulation and image interpretation for each route.

Subsequently, chapters 5-7 discuss the first trimester with a special focus on sonoembryology and how to date the pregnancy. Key features for viable versus non-viable gestations, ectopic pregnancies as well as pregnancies of unknown location are presented. In addition, first trimester screening using nuchal translucency for Down's syndrome as well as screening for structural abnormalities are reviewed and illustrated.

Chapters 8-15 cover the second trimester scan with a chapter dedicated to each organ system. In addition assessing fetal growth, the amniotic fluid, placenta, cervix and multiple gestation are extensively covered in a practical manner. A unique feature of the text are illustrations on how to manipulate the probe on the maternal abdomen in order to obtain key anatomic and biometric planes.

In addition, there are several schematic diagrams to corresponding sonographic images that help in the clarification of challenging interpretations. Chapters 16-19 address scanning the non-pregnant patient addressing the unique sonographic features of the uterus throughout the menstrual cycle. It also covers the most common uterine and ovarian pathologies. Key sonographic characteristics to differentiate 15 different types of ovarian cysts are brilliantly presented in a simple summary table. The text concludes with a chapter on professional issues providing insight from years of experience in both the clinical and academic arenas and there are several useful appendices.

CFAFC highly recommends this invaluable text to clinicians, educators and students, irrespective of their level. It is the condensation of long years of experience.



Upcoming AIUM

The **Annual Convention** of the **AIUM** will be held in Orlando, Florida March 25-29, 2017. There will be over 120 sessions in 18 different tracks given by leaders in the field. In addition, there will be a full day pre-convention course "Fetal Anatomy: Head to Toe" as well as a half day pre-congress course "NAFTNet Fetal Therapy Update". For further details, and for registration information, please visit the **AIUM Website**.



Hot-Off-The-Press

Upcoming ISUOG Activities

ISUOG has several outstanding educational activities coming up. It commences in Singapore with the **13th Singapore ISUOG Course** Feb 9-12, then Cape Town for **ISUOG's 13th International Symposium** which has been incorporated into the **RCOG's World Congress** Mar 20-22. This will be followed by a London-Based course on **Multiple Pregnancy**. Further details on these courses are available at **ISUOG Website**.



Upcoming OBFEGYN Conference in Dubai

The 7th International Conference on Obstetrics, Fetal Medicine and Gynaecology "Evolving Standards" will be held in Dubai on February 24 and 25. A rich and varied program is planned over 2 intense days of presentations to be given by leaders in the field: Drs. Bilardo, Jeanty, Kalache, Poon, Persico, Suresh and Visser among others. For further details and registration information, visit the **OBFEGYN Website**.



SANA Update

SANA had a most memorable Fall where 8 of SANA's trainee-midwives successfully completed all theoretical and practical requirements and were awarded **ISUOG** Certification. A ceremony was held in honor of the trainees at the Lebanese University, Tripoli Branch and it was attended by the Dean of the Faculty of Public Health, Dr. Mawlawi and the director of the Midwifery School, Dr. Ziade. Details at **SANA's Website** and **FB Page**.



CFAFC News

CFAFC's Reem S. Abu-Rustum was honored to have been invited to Riyadh, KSA to the **1st Workshop on Advanced and Basic US** at the King Faisal Specialist Hospital and Research Center. She gave the plenary keynote lecture "Future Trends in Obstetrical Sonography" and 3 other talks. She served as a trainer with the **ISUOG Outreach Team in Sudan** and participated in the AUBMC Ob/Gyn Resident US course. She was invited to contribute to "The Examiner" discussing "IT: Fast Facts" in the **Winter 2017 Issue**. She is ever so grateful for these opportunities...



ACOG, with the endorsement of the **AIUM**, has just released the updated **Practice Bulletin on Ultrasound in Pregnancy**.

This comprehensive document commences with background information where instrumentation and the various types of sonographic examinations are discussed.

The early first trimester scan is then covered in detail: from the indications for the examination, to the imaging parameters and finally, the cut-offs for the ascertainment of fetal viability. The second and third trimester scans are then discussed with respect to the indications for the examination as well as the imaging parameters. Key topics such as multiple gestation, placental localization, amniotic fluid quantification and cervical length measurement are reviewed. Fetal biometry and gestational age determination are reviewed. In addition, there is a brief overview on three-dimensional sonography.

The next section of the Bulletin addresses accreditation, documentation, patient safety and cleaning/sterilization of the sonographic equipment, all areas of critical importance to the sonologist.

As with other Practical Bulletins, the most valuable section of the document is in the "Clinical Recommendation and Recommendations" section which addresses such key questions as the optimal gestational age for the exam, sensitivity in anomaly detection, sonographic gestational age determination, screening for chromosomal aberrations, fetal anemia, intrauterine growth restriction among many others.

The Bulletin ends with a summary of conclusions and recommendations. CFAFC recommends an in depth review of this Bulletin to all who are involved in obstetrical sonography.



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CFAFC expresses its sincerest appreciation to all of our contributors. For any interesting case reports, comments, suggestions or announcements, please send an e-mail to rar@cfafc.org.

“Mystery is at the heart of creativity.
That, and surprise.”

1098**Julia Cameron**1596

Kindly note that all colored text contains embedded '[clickable](#)' links.

Upcoming Congresses

COURSE TITLE	DATES	LOCATION	WEBSITE ADDRESS
13th ISUOG Course in Singapore	Feb 9 - 12, 2017	Singapore, Singapore	http://www.isuog-sg-2017.com/#/home
40th Annual Advanced Ultrasound Seminar in Ob/Gyn	Feb 16 - 18, 2017	Orlando, FL	http://www.aium.org/cme/events/sem2017/sem2017.aspx
The 7th International Congress on Obstetrics, Fetal Medicine and Gynaecology	Feb 24 - 25, 2017	Dubai, UAE	http://www.obfegyn.org
20th Annual Obstetric Ultrasound: Setting the Standard for 2017	Feb 24 - 26, 2017	Toronto, Canada	http://www.obandwomensimaging.ca
European Society of Radiology	Mar 1 - 5, 2017	Vienna, Austria	http://www.myesr.org/ecr-2017
The 9th International Symposium on Diabetes, Hypertension and Metabolic Syndrome	Mar 8 - 12, 2017	Barcelona, Spain	http://www.comtecmed.com/dip/2017/welcome.aspx
RCOG World Congress Incorporating ISUOG's 13th International Symposium in Cape Town	Mar 19 - 22, 2017	Cape Town, South Africa	http://www.rcog2017.com
Annual Convention of the American Institute of Ultrasound in Medicine	Mar 25 - 29, 2017	Orlando, FL	http://www.aium.org/annualConvention
1st World Congress on Maternal Fetal Neonatal Medicine	Apr 23 - 26, 2017	London, UK	http://www.worldmfnm.eu/
16th World Congress of the Fetal Medicine Foundation Medicine	Jun 25 - 29, 2017	Ljubljana, Slovenia	https://fetalmedicine.org/fmf-world-congress

Prenatal Diagnosis of Amniotic Band Syndrome at 14W3D. By Drs. F. Farhat, J. Saoud and N. Helou

A 37-year-old G8 P6016 patient presented for a second opinion at 14w3d of gestation. She had a prior spontaneous abortion with no D&C. Otherwise, prior medical and family history were negative. A transabdominal scan was performed and revealed a female fetus with a partially absent calvarium and protruding brain tissue (*Figures 1-3). In addition, there was a deformity of the right upper limb (white arrows in Figures 2,3) and multiple band-like structures across the amniotic cavity attached to the left foot and brain (white circles in Figure 1,3). The findings were consistent with an amniotic band syndrome and were confirmed post termination of pregnancy (Figure 3).



Figure 1



Figure 2



Figure 3

The main differential diagnosis for band-like structures on an obstetrical ultrasound is uterine synechae. These are adhesive bands that usually develop as a result of uterine instrumentation or infections. In the majority of cases, they tend to be incidental findings with normal fetal anatomy.

Amniotic band syndrome (ABS), also known as Streeter Dysplasia, is a very rare entity with an incidence of 1 per 10,000 pregnancies with no sex predilection. It has a poor outcome. Currently, the most widely supported hypothesis is the extrinsic theory, introduced by Torpin in 1965, that suggests that maternal trauma leads to rupture of the amniotic membrane, which then forms strands that are often multiple and tend to freely criss-cross the amniotic sac.

Fetal entanglement in the amniotic bands may occur resulting in a range of abnormalities: from superficial band constriction (merely leading to cosmetic problems), to full limb amputations (Patterson classification of limb deformities), dissection of the abdominal wall (gastroschisis), face (cleft lip/palate), cranium (encephalocele), and other associated findings (renal abnormalities, cardiac defects etc). Treatment depends on the medical stability of the child and on the neurovascular status of the limb.

Although genetic predisposing factors may be involved as suggested by a higher incidence of ABS in first degree relatives of affected individuals, other environmental risk factors are yet to be clearly determined (smoking, medications..). As such, meticulous sonographic examination is necessary to establish the diagnosis and its associated abnormalities.