Abstracts released on the occasion of the 10th SASUOG Congress

Durban, 18 - 20 April 2008

Message from the Organising Committee

The Durban Organising Committee welcomes you to the 10th SASUOG Congress to be held at the Inkosi Albert Luthuli Convention Complex (IALCC) on 18 - 20 April 2008. This prestigious venue is ideally situated in the heart of Durban, with its magnificent views of the coastline and easily accessible transportation. The specially chosen theme of our congress is 'Imaging in Obstetrics and Gynaecology – A Holistic Global Approach'. Our objective is to present to you the most recent advances in imaging techniques involving all spheres of maternal, child and women's health.

The scientific programme will focus on the latest advances in research, clinical applications and technical developments in imaging in obstetrics and gynaecology. Hear what our experts have to say on the latest in prenatal screening and intrauterine therapy and pick up some tips and tricks in volume ultrasound and 3D/4D imaging, Doppler ultrasonography and the role of fetal MRI. For the first time we are introducing a medico-legal session by a panel of experts, on case scenarios and lessons to learn, including legal and ethical issues in obstetric practice and how to avoid litigation in obstetric ultrasound.

Imaging in gynaecology is advancing significantly. This is the ideal opportunity to exchange ideas with our experts and share their experience with regard to breast imaging, sonohysterography imaging in osteoporosis and prediction of fractures, and imaging in urogynaecology and infertility, among others. Integrated into the mainstream programme will be two afternoon sessions of live pregnancy and gynaecology scanning by our experts. For the early birds – join us for a special Breakfast Symposium sponsored by Johnson & Johnson on Saturday 19 April 2008 at 06h30. The presentation will be on 'Save the uterus – alternatives to hysterectomy', by an international guest speaker. A special multicultural entertainment has been arranged for you during the Cocktail Function on Friday and Gala Dinner on Saturday at the IALCC. Be sure to visit our Trade, without which a congress of this calibre would not be possible. Enter our 'Visit a Stand Competition' and 'Ultrasound Quiz' and stand a chance to win numerous prizes.

The Organising Committee is making every effort to ensure that this congress creates a platform for learning and exchange of ideas in wholistic imaging in obstetrics and gynaecology. We have carefully selected a panel of international, national and local speakers to share their experience and knowledge with you. Their abstracts are published in this edition of *SAJOG*, and released on the occasion of the 10th SASUOG congress. We hope that this collection of abstracts will be easy and enjoyable to read and also be beneficial and useful, as it is specially intended for the busy practitioner and also for those who were unable to attend the congress.

We hope you enjoy our Durban hospitality!

Siva Moodley *Convener*

Logie Govender *Chairperson – Scientific Committee*

Organising Committee members

Des Sankar, John Parkes, Hasmita Gandhi, Mala Panday, Namitha Chabilal, Premla Moodley, Tshidi Sebitloane

Abstracts

CERVICAL CANCER AND HPV-RELATED DISEASES

Franco Guidozzi

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In South Africa about 7 000 women will develop cervical cancer annually, and of these about 4 000 will die from the disease. It is the most common cancer among black women, accounting for about 32% of their cancers. Central to the aetiology of cervical cancer and the other anogenital cancers, namely vulval, vaginal and anal, are the 'high-risk' human papillomaviruses. The lifetime risk of acquiring HPV infection for any sexually active woman is about 60% by the age of 50 years and about 80% by 70 years of age. The 5-year cumulative risk for HPV infection is about 45% in women aged 15 - 19 years, and although this decreases with age, there is still an appreciable risk of about 12.5% in women aged 45 years and above. HPV gains access to the basal layer of the cervix through micro-abrasions produced during sexual activity or through the transformational zone. Persistence of the virus for years within this layer is key to the aetiology of the cervical cancer. HPV 16 and 18 are responsible for about 70% of cervical cancers, even though the exact worldwide prevalence may vary from continent to continent. High-risk types 16, 18, 31, 33, 45, 52 and 58 account for about 90% of all cervical cancers. The disease burden produced by the HPV infection does not only include invasive cancer of the anogenital tract. HPV types 6, 11, 16, 18 are also responsible for about 15%

of low grade SIL and 50% of high grade SIL, while types 6 and 11 account for about 90% of genital warts. The global burden of HPV-related anogenital disease is immense and it is estimated that about 500 000 women will develop cervical cancer, 10 million high grade SIL, 30 million low grade SIL, 30 million genital warts and 300 million HPV infection without detectable abnormalities annually. Although the burden of HPV-related recurrent respiratory papillomatosis (RRP) is appreciable, it is infinitely less than that of anogenital disease.

From a South African perspective, our only strategy to combat invasive cervical cancer has been, and still is, screening. This has encompassed utilising either pap smearing, HPV testing or visual inspection methods and then referring those with abnormalities for intervention. Unfortunately, these modalities of secondary prevention have proved to be particularly unsuccessful for many reasons – some being inherent to a country such as ours, others the specific characteristics of the different screening tests.

The advent of primary prevention of cervical cancer with the development of prophylactic HPV vaccines is exciting, meaningful and of extreme importance. GARDASIL, or the QUADRIVALENT VACCINE, contains virus-like particles for HPV types 6, 11, 16 and 18. It has been registered since June 2006 for the prevention of premalignant conditions of the vulva, vagina, cervix and anus, the prevention of invasive cervical cancer and the prevention of genital warts. It has been shown in clinical trials to be highly effective in preventing the development of invasive anogenital cancer caused by HPV types 16 and 18 and genital warts caused by types 6 and 11. The US Advisory Committee on Immunization Practices (ACIP) recommends the routine vaccination of females aged 11 - 12 years, but it can be started as young as 9 years. Vaccination is also recommended for females aged 13 - 26 years who have not previously been vaccinated. Ideally, the vaccine should be administered before potential exposure to HPV infection through sexual contact, although females who might already have been exposed to HPV should be vaccinated. A cervical cytology smear or HPV testing are not necessary at any age before commencing the vaccination series, which consists of 3 injections at 0, 2 and 6 months. It is imperative that all adolescents and young women who have been vaccinated must continue having cervical cancer screening. The vaccine must be seen as a preventive tool and not a substitute for cancer screening. Sexually active women, women with previous CIN and women who are immunosuppressed can receive the vaccine, although all these patients should be counselled that the vaccine may be less effective and benefits may be limited. The vaccine is not licensed for use among females aged <9 years or >26 years or for use in pregnancy, even though adverse outcome has not been shown to occur. Lactating women can receive the vaccine. Persons with mild acute illnesses can be vaccinated, although it would be prudent to defer its administration in those with moderate to severe illnesses. Minor complications occur in about 5% of patients and are almost exclusively confined to the site of injection. Serious adverse events are very rare.

From a South African perspective, implementation of the vaccination will depend on cost, incorporating an ethos of adolescent vaccination programmes and political buy-in.

NEW DEVELOPMENTS IN PRENATAL SCREENING AND DIAGNOSIS

Jon Hyett

Department of Obstetrics and Gynaecology, Royal Prince Alfred Hospital, Sydney, Australia

There are three common causes of poor neonatal outcome: congenital abnormality, preterm delivery and significant growth restriction. Obstetric ultrasound can be used to predict the risk of each of these, and a common method for individualized risk assessment has been developed that allows this process to start in the first trimester.

Although congenital anomalies have the lowest prevalence of these morbidities, the methodology for predicting risk in individual pregnancies was developed for Down syndrome screening. Combined first trimester screening is now accepted as the preferred test to screen for Down syndrome. This involves ultrasound measurement of fetal nuchal translucency and measurement of maternal serum levels of βhCG and PAPP-A with a sensitivity approaching 90% for a 5% false positive rate. Amongst other problems with the roll out of such a test is the cost of both ultrasound and biochemical components. In some arenas it may be better to use just one method of assessment. Recently, new ultrasound markers have been described in the first trimester, including an absent nasal bone, the presence of tricuspid regurgitation and abnormal flow in the ductus venosus which may all be usefully combined with NT assessment to give a similar efficiency of screening but avoiding biochemical testing. Alternatively, if the skills and equipment necessary for first trimester ultrasound assessment are not available, the introduction of other first trimester biochemical markers may provide another means of risk assessment. The development of molecular genetic methodologies now allows the non-invasive diagnosis of some genetic disorders, and will potentially be useful to diagnose aneuploidy in the future. These novel tests are discussed.

The prevalence of preterm labour has been increasing in the developed world, and this is becoming a major concern for health care providers. Recent data suggests that preterm labour can be both predicted and treated effectively with ultrasound assessment of cervical length at 18-23 weeks gestation and using progesterone pessaries to delay the gestation of delivery and improve neonatal outcome. The potential applications of cervical screening are discussed.

Intrauterine growth restriction, pre-eclampsia and placental abruptions have all been associated with placental insufficiency and there is evidence that this may be apparent in the first trimester. A combination of ultrasound and biochemical markers may be able to predict a group at high risk of these outcomes. The challenge of being able to modify obstetric outcome remains.

Jon Hyett is Professor of Obstetrics at the Royal Prince Alfred Hospital, Sydney, Australia. He has a strong research record in Fetal Medicine. His thesis was based on screening for congenital cardiac defects using nuchal translucency. He is also involved in training and accreditation in Obstetric Ultrasound screening under the auspices of the Fetal Medicine Foundation, UK.

AUDIT IN SECOND-TRIMESTER DOWN'S SCREENING

Desmond Sankar

Combining maternal age with serum screening at 15 to 18 weeks' gestation will detect 60 to 70% of pregnancies with Down syndrome with a false positive rate of 5%. A positive screen is anything with a risk of 1: 270 or greater.

Factors that influence the result include:

1. Accurate dating of the pregnancy by ultrasound
2. Maternal diabetes
3. Maternal weight
4. Smoking
5. HIV – Patients with a high viral load and low CD4 count have a higher HCG and AFP level (1)
6. Patients on protease inhibitors (ARVs) have lower AFP levels. The HCG levels and oestriol levels do not appear to be affected. (2)

Second trimester ultrasound markers for trisomy 21 include: Brachycephaly, mild ventriculomegaly, nuchal oedema (or nuchal fold thickness), nasal hypoplasia, cardiac defects (manily atrioventricular septal defects), duodenal atresia and echogenic bowel, mild hydronephrosis, shortening of both the femur and more so, the humerus, sandal gap and clinodactyly or mid-phylanx hypoplasia of the fifth finger.

The risk for chromosomal abnormalities increases with the total number of defects that are identified. In contrast, the absence of any major or minor defects is associated with a reduction in the background risk. Nicholaides (3) combined data from two leading centres (Nyberg et al (4) and Bromley et al (5)). There were 350 fetuses with trisomy 21 and 9384 chromosomally normal fetuses. In 25.7% of the trisomy group and 86.5% of the chromosomally normal group, there were no major defects and absence of the following markers – increased nuchal fold, echogenic bowel, echogenic intracardiac focus, mild hydronephrosis, short humerus or short femur. The likelihood ratio for trisomy 21, if there is no detectable defect or marker, is 0.30 (95% CI 2.25 -0.35).

The data is summarised in the table below.

The likelihood ratio is determined by dividing the incidence of each marker in trisomy 21 by the incidence in chromosomally normal fetuses. Please refer to Nicholaides's (3) editorial for the complete methodology on the calculation for a positive and negative likelihood ratio. However, if a patient was referred with a positive trisomy 21 risk of 1:100 and the only anomaly detected was an increased nuchal fold, then her risk is increased to 1:10 (100/10 = 10). If the same patient had a negative scan, then her risk would be reduce to 1:333 (100X10 /3) – now screen negative. The conversion of a positive to negative screen has a strong emotional impact on the patient. She can decide whether she wishes to have an amniocentesis or not.

Cicero (6) reported on nasal bone hypoplasia/absence. Nasal bone hypoplasia was defined as nasal bone measuring less than 2.5mm or being absent.

I will review the outcomes of the patients referred with positive trisomy 21 screens that were referred to me.

References

1. Gross S, Castillo W, Crane M, Espinosa B, Carter S, De Veaux R, Salafia C. Maternal serum alpha-fetoprotein and human chorionic gonadotropin levels in women with human immunodeficiency virus. *Am J Obstet Gynecol* 2003; 188: 1052-1056.
2. Einstein FH, Wright RL, Trentacoste S, Gross S, Merkatz IR, Bernstein PS. The impact of protease inhibitors on maternal serum screening analyte levels in pregnant women who are HIV positive. *Am J Obstet Gynecol* 2004; 191(3): 1004-1008.
3. Nicholaides KH. Screening for chromosomal defects. *Ultrasound Obstet Gynecol* 2003; 21: 313-321.
4. Nyberg DA, Souter VL, EL-Bastawissi A, Young S, Luthhardt F, Luthy DA. Isolated sonographic markers for detection of fetal Down syndrome in the second trimester of pregnancy. *J Ultrasound Med* 2001; 20: 1053-1063.
5. Bromley B, Lieberman E, Shipp TD, Benacerraf. The genetic sonogram. A method of risk assessment for Down syndrome in the second trimester. *J Ultrasound Med* 2002; 21: 1087-1096.
6. Cicero S, Sonek JD, McKenna DS, Croom CS, Nicolaides KH. Nasal bone hypoplasia in trisomy 21 at 15-22 week's gestation. *Ultrasound Obstet Gynecol* 2003; 21: 15-18.

Dr D Sankar is a consultant Obstetrician and Gynaecologist in private practice in Durban, SA. He has a special interest in Fetal Medicine.

LATE TOP FOR DOWN SYNDROME – A GENETICIST'S VIEWPOINT

William S Winship

Counselling parents following the discovery that their unborn child has an abnormality is never easy, but a

	Trisomy 21 (%)	Normal (%)	Positive LR (95% CI)	Negative LR (95% CI)	LR for isolated marker
Nuchal fold	107/319(33.5)	59/9331(0.6)	53.05(39.37-71.26)	0.67(0.61-0.72)	9.8 (10)
Short humerus	102/305(33.4)	136/9254(1.5)	22.76(18.04-28.56)	0.68(0.62-0.73)	4.1
Short femur	132/319(41.4)	486/9331(5.2)	7.94(6.77-9.25)	0.62 (.56-0.67)	1.6
Hydronephrosis	56/319(17.6)	242/9331(2.6)	6.77(5.16-8.80)	0.85(5.16-8.80)	1.0
Echogenic focus	75/266(28.2)	401/9119(4.4)	6.41(5.15-7.90)	0.75(0.69-0.80)	1.1
Echogenic bowel	39/293(13.3)	58/9227(0.6)	21.17(14.34-31-.06)	0.87(0.83-0.91)	3.0
Major defect	75/350(21.4)	61/9384(0.65)	32.96(23.90-43.28)	0.79(0.74-0.83)	5.2

request for termination of a pregnancy for a fetus with Down syndrome when the fetus is already viable presents the counsellor with a complex situation.

Consideration must be given to the capacity of the parents to understand the significance of the diagnosis in the context of their family and their ability to make an informed decision as well as the ethical dilemma which the decision they make places on those who will be required to undertake the procedure or provide long term care should they decide against termination.

Each case is unique. There can never be one approach to suit all.

Factors that must be considered will be discussed in this presentation.

William Sinclair Winship is an Honorary Part-Time Associate Professor in the Department of Paediatrics and Child Health, Faculty of Health Sciences, University of KwaZulu-Natal and Part-time Consultant in Medical Genetics for the KwaZulu-Natal Department of Health. He was formerly a Principal Paediatrician / Senior Lecturer at Addington Hospital, Durban.

BREAKING BAD NEWS

Hemandra Ramdhani

A birth defect refers to any abnormality of structure or function that has its origin prior to birth. Structural birth defects may be diagnosed prior to birth e.g. hydrocephalus, hydranencephaly, etc. but functional birth defects may only become apparent later, e.g. haemophilia. Dramatic developments in antenatal care have led to many new ways to screen for and diagnose birth defects. Parents are now faced with the need to make difficult decisions, based on complex information and often in a relatively short period of time. Health professionals need to be able to give this information in a clear, sensitive, non-directive, non-judgemental manner and interpret the information in a way that is appropriate for parents' needs. Furthermore, the way in which this information is delivered can lessen anxiety and make a real difference to the parents' experience of antenatal care.

This presentation will highlight some of the important principles when breaking bad news with specific reference to its application in the prenatal diagnosis of structural birth defects.

Dr Ramdhani qualified as a Paediatrician in 1998 and completed sub-speciality training in Medical Genetics in 2005. He is currently employed as a medical geneticist in the Mother and Child Domain at the Inkosi Albert Luthuli Central Hospital in Durban. His interests are genetic education and outreach.

FETAL ECHO AT 11 - 14 WEEKS SCREENING

Bernard Benoit

Until the early 90s ultrasound evaluation of the first trimester fetus was mainly performed to confirm vitality, the intrauterine localization of pregnancy and to assess gestational age. The advent of transabdominal and transvaginal high-resolution ultrasound technology allowed a targeted examination of early pregnancy ruling out major malformations. In the recent years it was suggested to offer a first trimester screening between 11-14 weeks' gestation.

Measurement of NT is used to assess the individual risk for Trisomy 21 in combination with maternal age. It was observed that fetuses with a thickened NT are not only at high risk for a chromosomal aberration but also have an increased risk of having a major cardiac malformation. In the meantime it is accepted that NT more than 2.5mm or at some places more than the 95th centile is an indication for a fetal echocardiography. This can be achieved in thickened NT (i.e. >3.5mm) already at 11-14 weeks as well.

The examination can be achieved by transabdominal route at 13 weeks' gestation but in fetuses with a CRL less than 70mm it is more reliable to perform a transvaginal fetal echo. The abdominal view may rule out heterotaxy anomalies. The sweep to the four-chamber view is then easily achieved if the fetus is in good position. Typical anomalies detectable in this plane at 11-14 weeks are: atrioventricular septal defect, single ventricle, some hearts with a hypoplastic left or right ventricle, cardiac malposition, and cardiomegaly in Ebstein anomaly. The assessment of the great vessels concentrates on the demonstration of the 3-vessel view, aided by colour Doppler. The demonstration of patent vessels of normal size with antegrade flow rules out most complex conotruncal anomalies. However the transposition of the great arteries is difficult to rule out at this stage.

Dr B Benoit, a consultant at Princess Grace Hospital, Monaco, gained worldwide recognition due to his focus in introducing innovative ultrasound technologies in the field of Obstetrics and Gynaecology, especially in the field of 3D and 4D ultrasound. These innovations include new visualisation techniques such 3D rendering and visualisation, which translates from his favourite pastime, photography. His speciality is the detection of first trimester malformations and he lectures internationally with the International Academy of Medical Ultrasound.

FETAL CARDIAC DEFECTS

Lut Geerts

Every fetal heart should be checked during pregnancy because cardiac defects are common and a significant cause of childhood death and morbidity. Unfortunately, many cardiac defects are still missed prenatally. To improve this situation, one needs to concentrate primarily on identifying those defects that require a change in obstetric or postnatal management since these changes will ultimately affect outcome. Management of fetal heart defects may include the offering of karyotyping or other genetic tests, termination of pregnancy, prenatal monitoring, medication, and a change in the timing, site or mode of delivery or the immediate stabilization of the neonate.

Expertise in fetal echocardiography is not widely available in SA and improved prenatal detection will entirely depend on improved universal screening rather than on universal expert echocardiography. Identification (and referral) of any deviation of normal cardiac anatomy on the routine scan should be practiced at a large scale but many obstetricians struggle to obtain all the views mentioned in textbooks. Hands-on training is time consuming and not widely accessible. Most "defects-that-matter" however can be detected by meticulous attention to 3 easily obtainable transverse views through the fetal torso. Improving the interpretation of these views can more readily be taught on a wide scale and should be South Africa's short-term goal in cardiac screening.

Dr Lut Geerts is a Principal Specialist and Head of the O&G Ultrasound Unit at Tygerberg Hospital, University of Stellenbosch, Cape Town. She worked as a Consultant in Obstetrics and Fetal Medicine at Harris Birthright Research Centre, Kings College Hospital, London, UK. She is an executive committee member of SASUOG and national co-ordinator for FMF-Nuchal Translucency screening program: Training and Audit. She has more than 20 peer-reviewed publications in the field of Fetal Medicine and hosted more than 10 ultrasound courses with hands-on training. Her special interests are chromosomal abnormalities, cardiac defects, multiple gestations, invasive procedures, and education in ultrasound.

SONOGRAPHIC EVALUATION OF THE FETAL BRAIN

Linnie Muller

The routine CNS examination includes: Head shape, Lateral ventricles, Cavum septi pellucidi, Thalami, Cerebellum, Cisterna magna and Spine.

The appropriate *axial planes* are: 1. The transventricular plane demonstrating the anterior and posterior portion of the lateral ventricles. 2. The transcerebellar plane demonstrating the cerebellum and posterior fossa. 3. The transthalamic or BPD plane demonstrating the frontal horns of the lateral ventricles, the cavum septi pellucidi, the thalami and the hippocampal gyri.

The *coronal planes* include 1. The transfrontal plane obtained through the anterior fontanelle and depicts the midline interhemispheric fissure and the anterior horns of the lateral ventricles on each side. 2. The transcaudate and 3. The transthalamic planes. Three *sagittal* planes are also usually studied: the midsagittal and the parasagittal of each side of the brain.

Three types of scanning planes can be used to evaluate the integrity of the spine including *sagittal, transverse and axial planes.* The most severe spinal abnormality, open spina bifida, is usually associated with abnormal intracranial anatomy. However, other spinal malformations including vertebral abnormalities and sacral agenesis can be seen on a longitudinal section of the fetal spine.

Most basic examinations can be performed with 3-5-MHz transabdominal transducers. Fetal neurosonography frequently requires transvaginal examinations usually performed with transducers 5 and 10 MHz. The best application of 3D ultrasound for brain examination lies in the multiplanar mode, particularly useful for the diagnosis of midline anomalies. The use of 3D examination of the fetal spine gives the possibility of visualizing the entire length of the bony elements of the spine of the mid-trimester fetus in one single image.

In a low risk pregnancy; good transventricular and transcerebellar planes, head measurements (head circumference in particular) within normal limits for gestational age, an atrial width less than 10.0 mm and a cisterna magna width between 2-10mm, can exclude many cerebral malformations. The risk of a CNS anomaly is exceedingly low and further examinations are not usually indicated.

Dr Linnie Muller obtained her Doctorate in Fetal Medicine from Stellenbosch University and Yale University. She is the Director of the Prenatal Genetics and Fetal Evaluation Unit, Panorama Medi-Clinic, Cape Town, South Africa. She is also a Part-time specialist at the Fetal-Maternal Unit, Department of Obstetrics, University of Cape Town and Groote Schuur Hospital. She is a founder member of both the International Society of Ultrasound in O & G (ISUOG) and SASUOG, a member of the South African Human Genetic Society and a member of the New York Academy of Sciences.

NEUROLOGICAL OUTCOME: HYDROCEPHALUS AND SPINA BIFIDA

Veysal Karan

Neurological outcome in patients with hydrocephalus is determined in part by the severity of treatment related complications. The complications of shunt placement include shunt infection, blockage and mechanical failure. Shunt failure rates are substantial in the first 2 years of life.

Open spina bifida is the most complex congenital abnormality compatible with long-term survival. 25-year follow up results from a group of patient will be discussed.

Dr V Karan qualified in 1988 from University of Istanbul, Istanbul Medical Faculty, and obtained MMed Neurosurgery degree from MEDUNSA in 2001. He worked as Consultant in Neurosurgery at Wentworth Hospital in 2002. He is presently the Acting Head of Department in Neurosurgery at Inkosi Albert Luthuli Central Hospital, Durban.

FETAL THERAPY

Seshadri Suresh, Indrani Suresh

Mediscan Prenatal Diagnosis and Fetal Therapy Centre, Chennai, India

The ability to image the fetus with ease and accuracy with ultrasound has helped us understand the anatomy and development of the unborn individual. Advancement

in biochemistry and molecular biology has led to a better understanding of fetal physiology and genetics. Accurate prenatal diagnosis is now possible in a significant number of cases.

Some of the conditions for which antenatal therapy are of proven value are:

- Supraventricular tachyarrhythmias
- Congenital adrenal hyperplasia
- Fetal thyroid disorders
- Rh isoimmunisation
- Non-immune hydrops (in selected cases)
- Fetal hydrothorax
- Twin-twin transfusion syndrome
- Selective reduction in multiple gestation
- Acardiac twinning

Rh-isoimmune disease: The diagnosis of fetal anaemia can be made by estimating the peak systolic velocity in the middle cerebral artery. When the MCA PSV is above 1.5 MoM for the period of gestation, intrauterine intravascular transfusion is indicated for correction of the anemia. Repeat transfusions are performed based on the rate of fall of hematocrit.

Fetal shunting: Obstruction to the fetal renal tract can be unilateral or bilateral. Unilateral obstructive uropathy does not require any prenatal intervention as long as the other kidney is functioning. Bilateral obstructive uropathy may be due to a pelvi-ureteric junction obstruction or a bladder outlet obstruction like a posterior urethral valve. Chromosome abnormalities are found in about 20% of cases with posterior urethral valve obstruction, therefore a karyotypic analysis must be performed whenever therapy is considered.

Vesico-amniotic shunting may help in selected cases. A double pig tailed shunt catheter is introduced into the fetal bladder with the distal end of the catheter in the amniotic cavity. Good decompression of the fetal urinary tract can be expected immediately after placement of the shunt. However, the long-term efficacy of a VA shunt is yet to be assessed.

A thoraco-amniotic shunt may be indicated to treat a primary pleural effusion or a large cyst in a congenital cystic adenomatoid malformation. Compared with vesico-amniotic shunting, more gratifying results are obtained with thoraco-amniotic shunting.

Multifetal reduction: Multifetal reduction is a term applied to describe the technique of reduction of a fetus or fetuses in higher-order multiple gestations. The procedure can be performed either through a transabdominal or transvaginal approach. In the transabdominal technique, a 22-gauge needle is passed through the sac into the fetal thoracic cavity and guided into the fetal heart. Two to four mEq of potassium chloride diluted (1:1) in distilled water is then injected intra-cardiac. The needle is withdrawn only after confirming cardiac asystole. The absence of cardiac activity and fetal movements should be ascertained by re-evaluation after the procedure.

Twin pregnancies: Monochorionic twins may result in twin-twin transfusion syndrome. This results in severe polyhydramnios in the recipient twin sac and oligohydramnios in the donor twin sac. Treatment includes serial amnioreduction or laser ablation of the anastamotic vessels, which has proved to be a better option in terms of better outcome.

In twin reversed arterial perfusion sequence, occlusion of the vessel in the acardiac twin can be achieved by an embolisation coil, by bipolar cautery or by laser.

Fetal arrhythmias: Fetal supraventricular tachycardia has been treated by maternal digoxin or other anti-arrhythmic agents such as verapamil, procainamide, propranolol, flecanide and amiodarone have been tried to restore normal cardiac rhythm.

Fetal thyroid disease: Fetal hypothyroidism can occur secondary to treatment to maternal hyperthyroidism or due to congenital thyroid defects and presents as an enlargement of the thyroid gland. The goitre may result in persistent extension of the fetal neck and difficulty in swallowing, polyhydramnios and preterm labour. Birth asphyxia and developmental delays have also been associated with thyroid defects. Weekly intra-amniotic injections of 250µgm of L-thyroxine appears to be effective in reducing fetal goitre and normalisation of fetal TSH levels.

A variety of prenatal diagnostic and therapeutic procedures are available for management of structural, hematological and biochemical problems in the developing fetus. Adequate care should be taken for selection of cases for prenatal diagnostic procedures. Fetal treatment schedules should be based on information available regarding the natural history of the disease and the risk / benefit ratio. Before embarking on any invasive therapy to the fetus, a karyotype of the fetus must be done. The parents should be counselled regarding the details of the procedure and the possible outcome.

Prof. Seshadri Suresh trained at Jefferson University and Johns Hopkins (USA) in abdominal/pelvic ultrasound and Doppler. He is Visiting Professor in the Department of Fetomaternal Medicine, Jawarharlal Institute, Pondicherry, Director of Mediscan System, the first ultrasound training and research centre in South India, has delivered 400 lectures and has over 50 publications to date, and is the author of 3 textbooks and 8 handbooks. He is Editor-in Chief of the Indian Journal of Medical Ultrasound.

THE MANAGEMENT OF COMPLICATIONS OF TWIN PREGNANCIES

Jon Hyett

The prevalence of multiple pregnancies has increased over the last 20 years. This is in part related to the trend of advancing maternal age for pregnancy, but is also related

to the increased use of assisted reproductive technologies. Twin pregnancies are associated with a 5-fold increase risk of neonatal mortality and an 8-fold increase in risk of adverse neurodevelopmental outcome. Vascular accidents related to monochorionicity and preterm delivery are the major factors causing this morbidity.

Chorionicity is best determined in the first trimester of pregnancy. At the routine 12 week (NT) scan, the membrane inserts into the placenta in a 'T' shape whereas in the dichorionic situation, where a peak of placental tissue rises between the membranes, this is a 'λ' shape. A statement of chorionicity should be made in all routine first trimester scans and should lead to differential management of monochorionic and dichorionic pairs. Chorionicity is also of importance when determining risks for chromosomal abnormality, considering the most appropriate invasive test and determining management of the anomalous twin.

The longitudinal follow up of a cohort of monochorionic twin pregnancies has shown that the periods of high risk for mortality occur between 16-24 and after 32 weeks. The main cause of mortality appears to be twin-twin transfusion; although issues related to selected intrauterine growth restriction is also a significant problem. In the second trimester, this is best monitored by serial ultrasound with scans every 2 weeks from 16 weeks of gestation, continuing to 26 weeks. In the third trimester early delivery (at 34-36 weeks) by caesarean section may reduce risk – although there is little prospective data to support this.

Jon Hyett is Professor of Obstetrics at the Royal Prince Alfred Hospital, Sydney, Australia. He has a strong research record in Fetal Medicine. His thesis was based on screening for congenital cardiac defects using nuchal translucency. He is also involved in training and accreditation in Obstetric Ultrasound screening under the auspices of the Fetal Medicine Foundation, UK.

ULTRASOUND IN THE LABOUR WARD AND POSTPARTUM

Ismail E Bhorat

A growing body of knowledge is accumulating regarding true intrapartum ultrasound, a relatively new application of ultrasound. Currently available data on intrapartum ultrasound assessment of active labour including engagement, descent, flexion, internal rotation (fetal head position), as an adjunct prior to instrumental delivery, cervical effacement, nuchal cord, efficiency of uterine contractions, intrapartum myometrial thickness and third stage of labour will be presented. Furthermore current data on the use of ultrasound and intrapartum Doppler velocimetry especially in the assessment of fetal cerebral haemodynamics, which shows promise as a non-invasive tool in the armamentarium of already existing intrapartum fetal surveillance technologies will be presented. Lastly current limitations of intrapartum ultrasound, recent developments and future possibilities of ultrasound as an objective assessment of active labour which hitherto still continues to be largely measured by the extremely subjective method of the vaginal digital examination in terms of advancing cervical dilatation with continued descent of the fetal head, will be discussed.

Dr I E Bhorat is a specialist Obstetrician and Gynaecologist in private practice in Durban, South Africa, and operates a dedicated Feto-Maternal Unit. He is accredited with the Fetal Medicine Foundation, London, UK, under Prof K Nicolaides. In 2006 he obtained full registration as a Subspecialist in Maternal and Fetal Medicine with the Health Professions Council of South Africa.

THE USE OF DOPPLER IN THE MANAGEMENT OF HIGH-RISK PREGNANCIES

Justin C Konje

A major contribution to perinatal morbidity and mortality is high-risk pregnancies. The management of these pregnancies is often fraught with late presentation and difficulties in monitoring and timing delivery to ensure that the fetus benefits maximally from its intrauterine existence but at the same time is not compromised. Unfortunately there are very poor screening tests for these pregnancies. For many of them therefore, preventative approaches are not uncommonly introduced late and therefore often ineffective. Traditional approaches to screening for high-risk pregnancies have included history and routine screening tests such as urinalysis. While these are able to identify a significant number of high-risk pregnancies, a large proportion is unpredictable. This is largely because these approaches to screening have a poor predictive value.

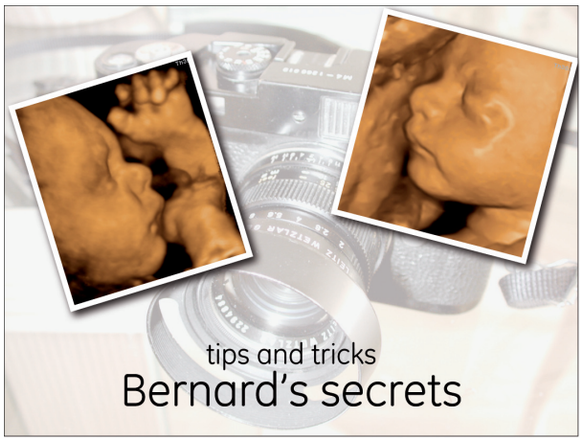
Even when high-risk pregnancies are identified, fetal and maternal monitoring is poor and for some women, preventing a poor outcome is difficult.

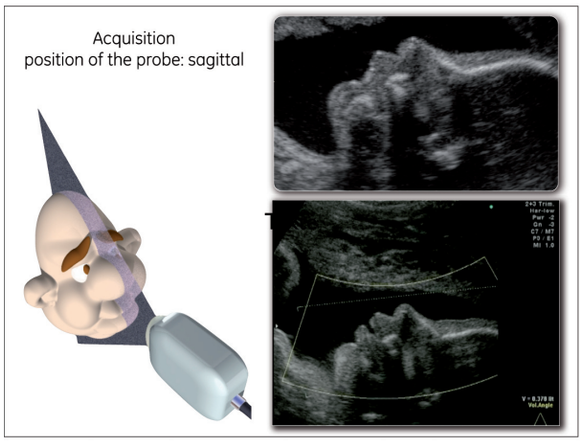
Fitzgerald and Drum introduced Doppler velocimetry in Obstetrics in 1977. Since then several investigations have been undertaken on this non-invasive screening and monitoring tool. In this lecture, I will focus on the role of Doppler in screening and management of high-risk pregnancies. Doppler velocimetry of the uterine artery is used for screening while that of the umbilical, middle cerebral and ductus venosus are used for monitoring of high-risk fetuses. Screening is mainly for pregnancies at risk of fetal growth restriction and pre-eclampsia while monitoring will include fetal growth restriction, and isoimmunisation.

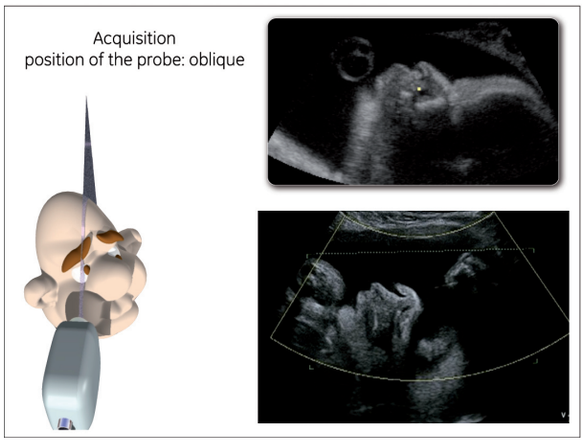
Professor Justin Konje is the Head of the Clinical Division of Obstetrics and Gynaecology at the University of Leicester (UK). He is also the Director of Maternal and Fetal Medicine Training Programme.

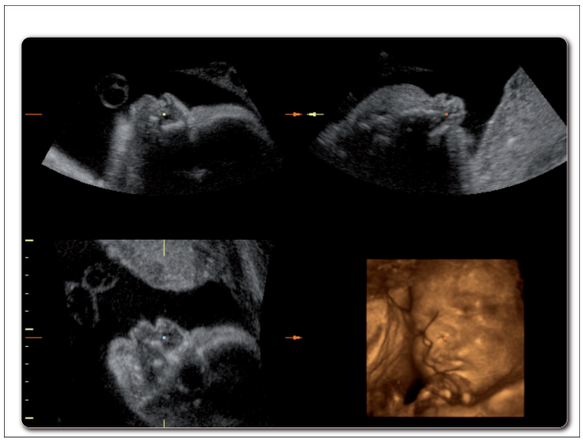
VOLUME ULTRASOUND – TIPS AND TRICKS

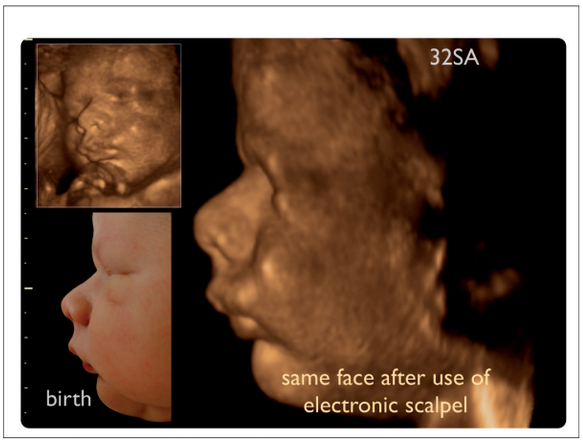
Bernard Benoit

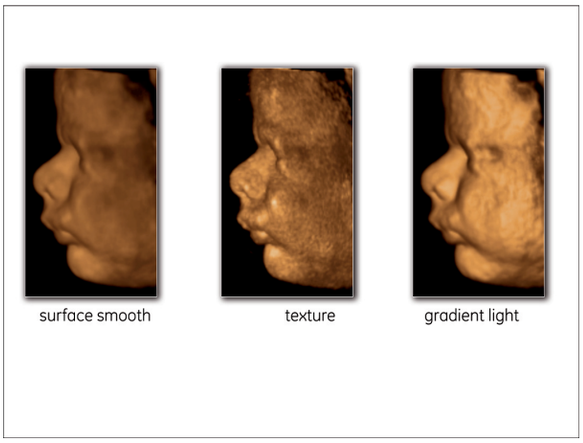


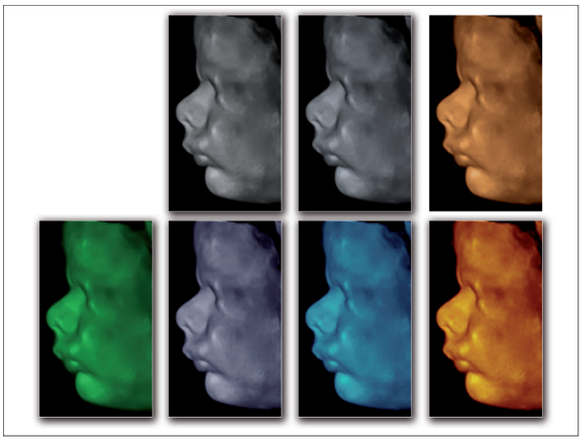


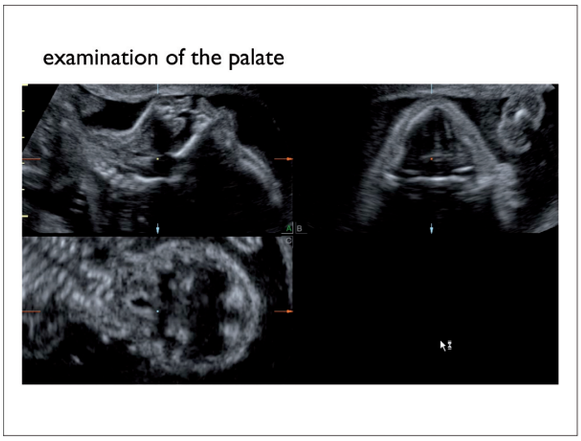


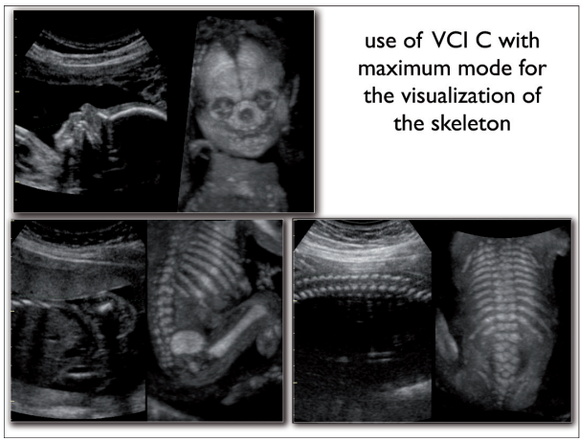


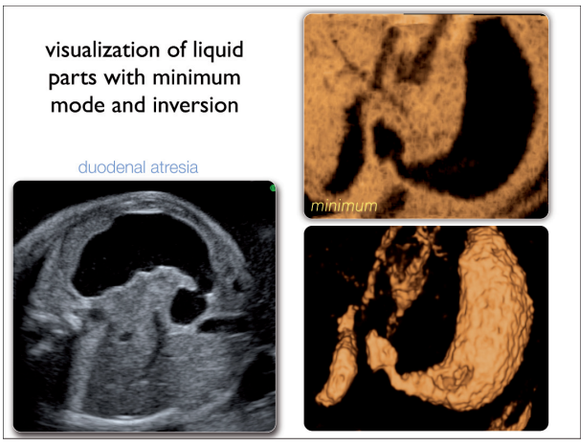


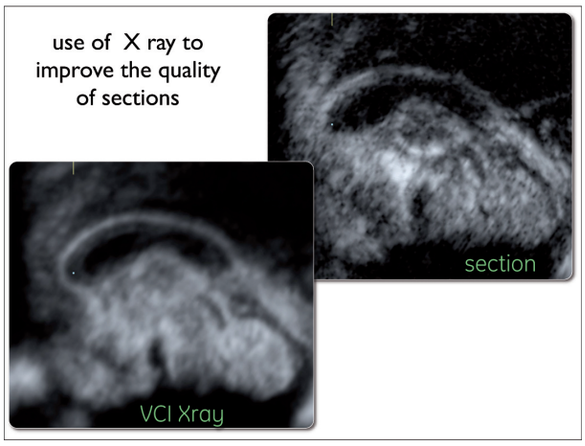


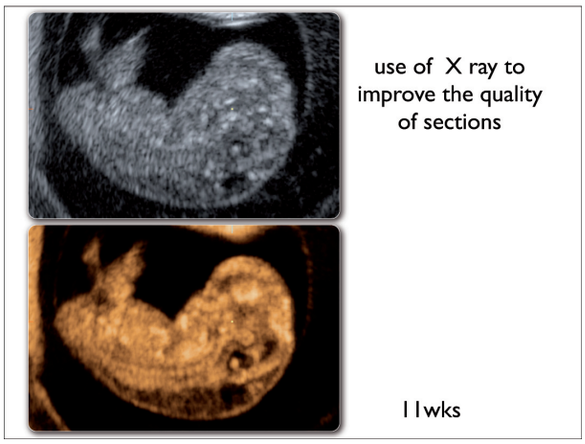












Dr B Benoit, a consultant at Princess Grace Hospital, Monaco, gained worldwide recognition due to his focus in introducing innovative ultrasound technologies in the field of Obstetrics and Gynaecology, especially in the field of 3D and 4D ultrasound. These innovations include new visualisation techniques such 3D rendering and visualisation, which translates from his favourite pastime, photography. His speciality is the detection of first trimester malformations and he lectures internationally with the International Academy of Medical Ultrasound.

FETAL MRI

Mala Modi

Magnetic resonance imaging (MRI) has been used extensively in neonatal imaging to further characterize abnormalities identified on ultrasound (US) or computed tomography (CT) scan. This technological success was followed by use of MRI in fetal imaging. MRI gives better soft-tissue resolution and anatomical delineation than US. While fetal MRI is used routinely in some institutions, US remain the primary fetal imaging modality.

Dr Mala Modi is a senior specialist and senior lecturer in the Department of Radiology and heads the Chris Hani Baragwanath hospital radiology department. She is an executive member of the College of Radiology, the Radiological Society of SA, is the assistant editor of the South African Journal of Radiology, and a member of the post-graduate committee of the University of the Witwatersrand. She is actively involved in the registrar academic programme, and is an exam tutor and examiner. Dr Modi has published extensively, and heads the Wits Radiology Research group, which involves supervising registrars and consultants in posters presentations, journal publications and MMed research papers. Her interests include neuroradiology, fetal MRI and MRI in general.

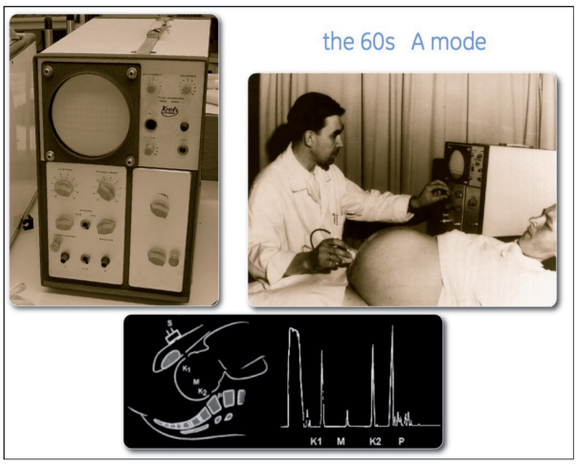
3D/4D OBSTETRIC SCANS

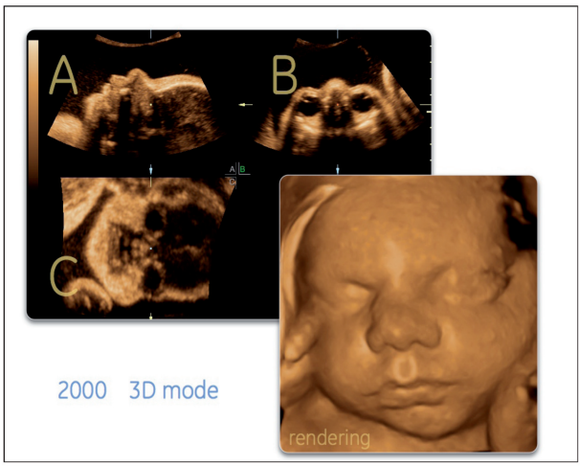
Bernard Benoit

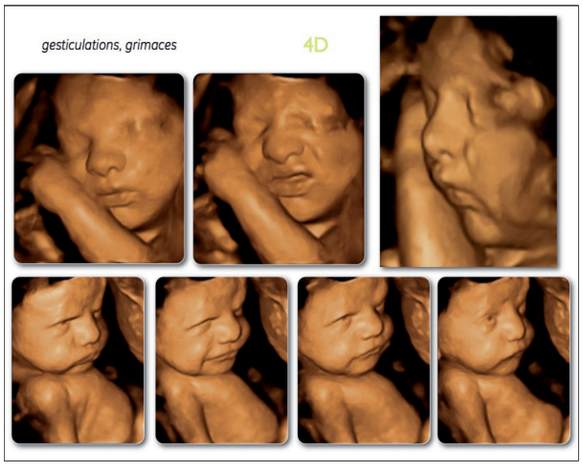
10 good reasons to use
3D ultrasound in obstetrics

- A new technic, a new visualization mode
- Permanent development, new tools every year
- A new view on fetal life
- First trimester: from the embryo to the fetus
- Helpful for the screening examination
- Assessment of fetal malformation
- "STIC" examination of the fetal heart
- Study of the fetal skeleton
- Volume measurements
- Storage of the data for "offline" diagnosis and teaching

The technical virtuosity of ultrasound has moved from the A-mode scan to third- and fourth-dimension real-time projection of fetal images. These developments raise compelling arguments for the introduction of these techniques into modern fetal medicine. A few examples are shown below.







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SAVE THE UTERUS – ALTERNATIVES TO HYSTERECTOMY

Janesh Gupta

Minimal Access Surgical Training (MAST) Unit, University of Birmingham, Birmingham Women's Hospital, Birmingham, UK

Current evidence is compelling and indicates that endometrial ablation should be considered where bleeding is having a severe impact on a woman's quality of life, and she does not want to conceive in the future. Endometrial ablation may be offered as an initial treatment for heavy menstrual bleeding (HMB) after full discussion with the woman of the risks and benefits and of other treatment options. Endometrial ablation should be considered in women who have a normal uterus and also those with small uterine fibroids (less than 3 cm in diameter) and preferable to hysterectomy. The evidence also shows that all women considering endometrial ablation should have access to a second-generation ablation technique.

I shall present this literature evidence as well as discuss the future important role of ambulatory outpatient office endometrial ablation and my experience with Thermachoice endometrial ablation in the outpatient setting under local anaesthesia.

TOCOLYTICS AND ANTENATAL CORTICOSTEROIDS: WHAT'S NEW?

Jon Hyett

Department of Obstetrics and Gynaecology, Royal Prince Alfred Hospital, Sydney, Australia

The prevalence of preterm delivery is increasing, with an associated risk of perinatal mortality and morbidity. Strategies that aim to improve pregnancy outcome include delaying delivery and optimizing the neonate's situation at birth. The evidence supporting these interventions has changed significantly in recent years.

Antenatal corticosteroids have been recognized to reduce perinatal morbidity and mortality for many years, but there has been confusion about the extent of their usefulness and the risk/benefit of multiple courses. Most of the original trials used steroids up to 34 weeks gestation and there has been some discussion as to the value of steroids beyond this time. A recent study of women undergoing early (<39 week) caesarean section has shown that there is benefit in giving steroids to all these women, with a significant reduction in neonatal admissions even at relatively late gestations. Similarly, repeat doses of corticosteroids appear to reduce the risk of respiratory distress syndrome and serious neonatal morbidity compared to giving a single dose, with no obvious effect on neurodevelopment or growth at 2 years of age, suggesting that many of the concerns about these outcomes that were based on data from animal models are not relevant to clinical care.

Indications for and types of tocolytics used have changed significantly over the last few years. Although highly specific receptor antagonists have been developed specifically for this indication, many centres use a relatively cheap oral calcium antagonist as the first line agent, which also has the benefit of relatively few side effects. The use of tocolytics has also decreased since the introduction of predictive tests that assess the risk of preterm delivery in symptomatic pregnancies. Most recently, data has been published that demonstrates a decrease in preterm delivery and an improvement in neonatal outcome in women who are not symptomatic for preterm birth but are found to have a short cervix on routine ultrasound assessment at 23 weeks' gestation.

Jon Hyett is Professor of Obstetrics at the Royal Prince Alfred Hospital, Sydney, Australia. He has a strong research record in Fetal Medicine. His thesis was based on screening for congenital cardiac defects using nuchal translucency. He is also involved in training and accreditation in Obstetric Ultrasound screening under the auspices of the Fetal Medicine Foundation, UK.

THE ROLE OF ULTRASOUND IN REDUCING PRETERM LABOUR

Justin C Konje

Preterm labour is the single most common cause of perinatal mortality, accounting for approximately two thirds of deaths. The incidence is rising worldwide and most of this risk is attributable to changes in lifestyle factors, an increase in the number of successful assisted reproductive techniques and genital tract infections. In the USA the incidence of preterm labour has almost doubled over the last decade. Although a similar rise has not been reported in Europe, the rate has increased by at least 30% in Leicester over the past decade.

Preterm labour occurring before 34 weeks gestation is associated with a higher perinatal morbidity and mortality. Although the factors enumerated above are a major reason for the increase, the pregnancies often present with warning signs that predate labour in some cases by weeks. If these are identified early then interventions could be introduced to reduce the risk of delivery preterm. In a proportion of preterm deliveries, labour is preceded by changes in the cervix, which becomes shorter and begins to dilate. These changes can be identified by early ultrasound and timely interventions introduced to delay delivery. This lecture will discuss the current approaches to reducing preterm birth using ultrasound scanning as a screening tool.

Professor Justin Konje is the Head of the Clinical Division of Obstetrics and Gynaecology at the University of Leicester (UK). He is also the Director of the Maternal and Fetal Medicine Training Programme.

THE 'BORDERLINE FETUS': FACTORS THAT INFLUENCE TIMING AND MODE OF DELIVERY

Ermos Nicolaou

Fetal intrauterine growth restriction (IUGR), formerly termed intrauterine growth retardation, is a confusing diagnosis based on non-consistent definitions. The end result may be that many diagnosed fetuses do not result in a severely compromised neonate. This leads to confusion as to the overall significance of a prenatal diagnosis of IUGR.

Perinatal mortality for infants with IUGR is 6 to10 fold greater than that for a normally grown population. 30% of all SB infants are growth restricted and 50% suffer intrapartum asphyxia. Doppler studies of the fetal, placental and uterine vasculature were developed in the 1980s and have since become an integral part of protocols used to assess IUGR. The thrust of fetal surveillance should be not only to avoid death, but also to avoid neurological sequelae.

Doppler ultrasound provides a non-invasive method for the study of fetal hemodynamics. Investigation of the uterine and umbilical arteries gives information on the perfusion of the uteroplacental and fetoplacental circulations, respectively, while Doppler studies of selected fetal organs are valuable in detecting the hemodynamic rearrangements that occur in response to fetal hypoxemia. Fetal venous Doppler studies are useful in monitoring the **growth restricted redistributing fetus**. Normal venous flow suggests continuing fetal compensation, whereas abnormal flow indicates breakdown of haemodynamic compensatory mechanisms. Perhaps this may be a little too late. Studies have suggested that the delivery of oxygen to the brain is preserved as long as the net blood flow in the fetal aortic isthmus is antegrade.

When retrograde aortic isthmus net blood flow, the delivery of oxygen is diminished, despite slightly increased volume blood flow to the middle cerebral arteries, and despite the flow in the ductus venosus may be normal.

While fetal multivessel Doppler surveillance and other forms of fetal surveillance such as the biophysical profile, provide insight into the fetal response to placental respiratory failure and hypoxaemia, timing of intervention is complex because it requires balancing the risks of prematurity against those of continued intrauterine stay.

Professor Ermos Nicolaou is Head of the Wits Maternal Fetal Medicine Centre, University of the Witwatersrand and Chris Hani Baragwanath Hospital, Gauteng, previous chairman of the Maternal Fetal Society of South Africa, member of the executive committee of the South African Society of Ultrasound in Obstetrics and Gynaecology

and Fellow of the Fetal Medicine Foundation. He trained at Kings College Hospital, London, in Fetal Maternal Medicine. Special interests include antenatal screening for chromosomal abnormalities and high-risk obstetric cases with emphasis on Doppler ultrasonography and intrauterine growth restriction.

CRANIAL IMAGING IN VERY LOW BIRTH WEIGHT BABIES

Mirriam Adhikari

Department of Paediatrics, Nelson R Mandela School of Medicine, University of KwaZulu-Natal

Introduction: Periventricular-intraventricular (PV) haemorrhage is the most common, well-known acute perinatal brain injury in low birth weight infants (LBWI). It is the major cause of death and disability in LBWI. The other major lesion is periventricular leucomalacia (PVL). The non-invasive technique of cranial ultrasound clarified many issues and assisted in documenting the decline in the 1980s from 34-39% <1500gms or <35 wks GA with intraventricular haemorrhage (IVH) to 15-20% in most centres currently.

Pathogenesis: Prematurity is the major factor with the associated complications of respiratory distress, associated pneumothorax, hyper- and hypotension, hypoxia and ischaemia and reperfusion injury contributing to the development of IVH. IVH occurs in first two days virtually all by one week. IVH occurs in the periventricular region, the germinal matrix that is very vascular with immature blood vessels, poor tissue support for vessels, which rupture easily, and is associated with coagulopathy. PV haemorrhagic infarction, the grade IV IVH is severe IVH and associated with intense venous congestion. Examples of the grades of IVH will be presented.

Periventricular leucomalacia (PVL) results from a complex interaction of cerebral vascular and cerebral blood flow disturbances, hypoxia, ischaemia, and cytokine cascade. Focal necrotic lesions develop in the periventricular white matter. The corticospinal tracts pass through this region that suffers damage and cerebral palsy may result depending on the extent of the injury. The focal necrotic lesions become echolucent and with time collapse. Lesions develop from three to twenty days. Other modality of assessing the brain is by MRI. Diffuse weighted magnetic resonant imaging (MRI) can detect PVL by day five. Antenatal Doppler measurement is a further technique that has shown correlation between fetoplacental blood flow, brain injury and brain volumes in VLBWI. Abnormal UA/MCA PI was associated with reduced brain volume and reduced cerebral volume.

Outcomes: Of those LBWI who die, 50% have IVH. Of the survivors 20-40% have IVH. Of those with severe IVH 50% die, moderate IVH 15% die and mild/small IVH 5% die. The outcomes for PVL are related to the duration of oxygen dependency, septicaemia, necrotising enterocolitis (NEC) and is worse with NEC and surgery. The extent of the PVL determines the outcome.

Prevention: Maternal factors include aspects of maternal health, health access and antenatal steroids. Neonatal factors include improved neonatal care, correction of metabolic acidosis, no fluid boluses, careful oxygen delivery, appropriate feeding and management of infections.

Mirriam Adhikari is the Professor and Head of the Department of Paediatrics and Child Health, Nelson R Mandela School of Medicine, UKZN and Chief Specialist in Neonatology at King Edward VIII Hospital, Durban. She has numerous publications in several peer-reviewed journals including Guest Editor of 5 journals. She also has extensive research experience and presently involved in at least 7 major research projects.

PROGNOSTIC FACTORS AND INTRAUTERINE SURGERY FOR CONGENITAL DIAPHRAGMATIC HERNIA

Justin C Konje

Congenital diaphragmatic hernia (CDH) complicates approximately 3.3/100,00 births. The overall mortality from a recent meta-analysis was 58% for cases diagnosed *in utero* and 48% for those diagnosed after delivery. The prediction of outcome following prenatal diagnosis is difficult because there are no specific prognostic factors. Several factors have, however, been investigated with varying success on their ability to prognosticate congenital diaphragmatic hernia. These factors include the time of diagnosis (the earlier the diagnosis the worse the prognosis), size of the hernia and the contents in the thorax, associated complications and pulmonary hypoplasia. Other factors, which have traditionally been used to attempt to predict outcome, include the presence of polyhydramnios, mediastinal shift and the presence of an intrathoracic liver. Although some of these prognostic factors seem quite obvious, there has been no study to demonstrate that these factors singly or in combination can be used to accurately predict outcome. Advances in imaging techniques and technology have enabled further investigations of other prognostic factors such as lung volume and vascularity, but these have failed to improve the prediction of prognosis. Consequently, attention has not unsurprisingly shifted towards in-utero surgery in order to reduce the perinatal mortality rate from CDH. This has been associated with limited success and the overall perinatal mortality remains high. In this presentation, I will be reviewing the evidence for and against various prognostic factors and the value of close monitoring following diagnosis to improve timing of delivery and outcome. The nature and indications of intra-uterine surgery and its complications will also be discussed. Finally, an approach to counselling and management following diagnosis will be discussed.

Professor Justin Konje is the Head of the Clinical Division of Obstetrics and Gynaecology at the University of Leicester (UK). He is also the Director of Maternal and Fetal Medicine Training Programme.

CONGENITAL DIAPHRAGMATIC HERNIA: A PAEDIATRIC SURGEON'S PERSPECTIVE

Larry Hadley

CDH is an unfortunate misnomer. The determinant of outcome in affected children is the degree of pulmonary hypoplasia and the inevitable pulmonary hypertension. The defect in the diaphragm is coincidental. Babies born with insufficient lung to maintain gas exchange will die. Antenatal diagnosis, in addition to identifying the primary pathology must assess prognostic features in order to allow staff and parents to make rational management choices. In South Africa where antenatal intervention is not available the choice is basically between term and termination. Elsewhere fetoscopic tracheal occlusion has replaced open fetal surgery as the intervention of choice. Antenatal steroids are currently under trial.

A plethora of indices has been proposed as survival indicators including the gestational age at diagnosis, presence of associated abnormalities, R: L ventricular ratio, method of delivery, liver herniation, gastric herniation, lung: head ratios and MRI lung volumetry. None have 100% predictive value. At the ends of the spectrum decisions are easy. Most babies however fall into the grey area. Since 2003 we have seen 29 children with CDH of whom only 8 were diagnosed antenatally. 6 were delivered at a tertiary centre. 4 died prior to surgery.

Immediate post-natal management impacts on survival. Transportation of these babies is fraught with hazard and they *must* be delivered at the tertiary care centre at which management is planned. Early passage of a NGT and avoidance of bag/mask ventilation prevents gas accumulation within the herniated viscera. Appropriate low-pressure ventilation, and/or high frequency ventilation maximizes lung function and minimizes barotrauma. NO or sildenafil may be used in an attempt to reduce pulmonary vasoconstriction. ECMO is not available and, in this context, its use remains controversial.

CDH is not a surgical emergency and delayed primary surgery is now standard. Patients who present after 24 hours should all survive. Long-term sequelae include the neurological consequences of neonatal hypoxia, gastro-oesophageal reflux, chronic respiratory insufficiency, spinal growth abnormalities and other aspects of 'global embryopathy'.

Professor Larry Hadley is Chief Specialist and Head of the Department Paediatric Surgery, Nelson R Mandela School of Medicine and Inkosi Albert Luthuli Central Hospital, Past President of the South African Association of Paediatric Surgeons, a member of the South African Children's Cancer Study Group and the Surgical Research Society of Southern Africa, and President of the International Society of Paediatric Surgical Oncology. He has published extensively on neonatal surgery, children's cancer, trauma and Paediatric Surgery in the Third World.

IS FIRST-TRIMESTER VOLUMETRY PREDICTIVE OF PREGNANCY LOSS IN PREGNANCIES COMPLICATED BY MISCARRIAGE?

J S Bagratee*, L Regan‡, V Khullar‡, J Moodley*, C Connolly†

**Department of Obstetrics and Gynaecology, Nelson R Mandela School of Medicine, University of KwaZulu-Natal, Durban, South Africa, ‡St Mary's Hospital and Imperial College, London, UK and †Medical Research Council, Durban, South Africa*

Objective: To determine whether the volumes of the gestational sac, yolk sac and the embryo, in addition to gestational sac diameter and crown rump length in the first trimester is predictive of pregnancy loss in threatened and missed miscarriage.

Methods: This was a prospective cross-sectional observational study of women presenting with vaginal bleeding between 6 and 12 weeks gestation to the Early Pregnancy Assessment Unit at St Mary's Hospital, London, UK. One hundred and thirty eight women with threatened miscarriage and 60 women with missed miscarriage (anembryonic and early embryonic demise) were included in the study (group 1) and compared to a group of 166 asymptomatic women with normal pregnancies in whom reference intervals of first trimester structures were developed (group 2). All women had conventional two-dimensional measurements of gestational sac diameter (GSD) and crown-rump length (CRL) and three-dimensional volumetric data of the gestational sac (GSV), yolk sac (YSV) and embryo (EV) recorded. Both groups were followed up prospectively. The pregnancy outcomes were noted and the recorded sonar measurements and clinical data compared statistically.

Results: There were no statistical significant differences in age, parity, previous pregnancy complications, gestational age or the presence of a yolk sac between the two groups. However, women with missed miscarriage had a higher mean age, parity and gestational age when compared to asymptomatic or threatened miscarriage women.

None of the asymptomatic women sustained a miscarriage whereas 22/138 (16 %) of women presenting with threatened miscarriage ultimately lost their pregnancies before 20 weeks.

In those women sustaining a pregnancy loss in the threatened miscarriage group, 21 out of 22 women (95.5%) had a GSV below the median and 12 out of 22 women (54.5%) had a GSV below the 5th centile. The risk of pregnancy loss in women presenting with a threatened miscarriage was greater in those with a GSV below the 5th centile compared to women with an asymptomatic pregnancy (OR: 23.7, 95%CI: 6.9 - 82.1). In women sustaining a missed miscarriage, both anembryonic and early embryonic demise pregnancies had a significantly lower GSV than asymptomatic women ($p< 0.001$).

Yolk sac volume was not found to be predictive of pregnancy loss in women with threatened miscarriage. However, women with an anembryonic missed miscarriage were more likely to have a YSV greater than the 95th centile compared to women with an asymptomatic pregnancy (OR: 6.8, 95%CI: 1.2 - 30.5). The yolk sac was present in significantly fewer women with missed miscarriage (28% vs 87%).

Regarding embryo volume, we found smaller embryo volumes in women with threatened miscarriage who miscarried their pregnancy (p=0.01).

The CRL and GSD were also significantly reduced in women with threatened miscarriage that lost their pregnancy and in women with missed miscarriage as compared to asymptomatic women (p=0.01 and <0.001, respectively).

Conclusion: Reduced gestational sac and embryo volumes and not yolk sac volume in women with threatened miscarriage are associated with higher risk of pregnancy loss. In addition, the reduced size of the gestational sac (GSD), and the embryo (CRL) are also associated with higher pregnancy loss.

In women with missed miscarriage; GSV, CRL and GSD are significantly lower than in asymptomatic pregnancies. Women with anembryonic pregnancies are more likely to have increased YSV.

Reduced volume and sizes of the gestational sac and embryo in women presenting with threatened and missed miscarriage are associated with increased risks of pregnancy loss.

Professor J S Bagratee is Head of Reproductive Medicine in the Department of Obstetrics and Gynaecology at the Nelson R Mandela School of Medicine, University of KwaZulu-Natal and King Edward VIII and Inkosi Albert Luthuli Central Hospitals.

SIGNIFICANCE OF INTRA-AMNIOTIC BANDS DETECTED SONOGRAPHICALLY

Logie Govender

Intra-amniotic band-like structures are seen fairly regularly on routine obstetric scans, especially during the first and second trimesters of pregnancy. It is important to try and establish the cause for such findings in order to determine the clinical significance and to assess prognosis. The vast majority of band-like structures are uterine synechiae, which are benign and have no clinical significance. These are usually detected as an incidental finding and do not intefere with growth and development of the fetus. Visualisation of these band-like structures must not be confused with the Amniotic Band Syndrome, especially when the fetal anatomy is normal. True amniotic bands are relatively rare and are usually associated with a poor prognosis, including a whole range of structural or anatomic abnormalities. Other, less common types of amniotic band-like structures may also be detected.

Although the precise diagnosis may not always be evident, misdiagnosis of synechiae as an amniotic band is quite common. This results in undue concern and anxiety about the development and outcome of an otherwise perfectly normal baby. Correlation of the ultrasound findings with the patients' history is also important. An overview of the different types of band-like structures detected sonographically, their classification and clinical significance will be presented.

Dr L Govender is a senior consultant and lecturer in the Department of Obstetrics and Gynaecology at the Nelson R Mandela School of Medicine, University of KwaZulu-Natal. She is a subspecialist in Maternal and Fetal Medicine and heads the Fetal Medicine Unit at Inkosi Albert Luthuli Central Hospital, Durban.

ATTITUDES OF WOMEN TO TERMINATION OF PREGNANCY FOR FETAL ABNORMALITY

Chantal J M Stewart

It has become routine practice to offer ultrasound scans to pregnant women at 20 - 23 weeks gestation for the purpose of detecting abnormalities. While this serves the purpose of reassuring women of the health of the fetus, in circumstances where an abnormality is detected, this engenders anxiety and difficult decision making about the pregnancy. In the instance of a lethal structural or chromosomal abnormality, termination of pregnancy is offered. In the instance of an abnormality, which could cause serious physical or mental sequelae to the child, termination of pregnancy is also offered. At the start of the pregnancy, these issues and possibilities may not have occurred to the woman or the couple. In addition, when abnormalities are detected later in the pregnancy, the options are further complicated.

In a 2-year period, women presenting to the Fetal Medicine Unit at Groote Schuur Hospital with abnormalities serious enough to warrant offering termination of pregnancy, the rate of terminations of pregnancy was as follows:

CNS	
Meningomyelocoele	57%
Anencephaly	48%
Hydrocephalus	27%
Holoprosencephaly	63%
CVS	17%
Skeletal dysplasias	50%
Lethal chromosomal abnormalities	50%
T21 with structural abnormalities	43%

Reasons for acceptance or non-acceptance of termination of pregnancy vary from religious and cultural beliefs to ideas about the suffering of the child if born, to social support systems. The relatively high acceptance rate for termination of pregnancy for meningomyelocoele may reflect attitudes towards mental retardation and physical handicap. In lethal conditions such and anencephaly, T18 and 13, the fact that there will not be a need to care for a handicapped child may influence the decision

and many women may thus find it easier to 'let nature take its course'. The relatively low acceptance rate for termination for serious cardiac abnormalities may reflect lack of understanding of the impact that multiple operations at a young age may have on the child and the family. All of these reasons need further study and elucidation.

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FETAL ANOMALIES – A SONOPATHOLOGICAL CORRELATION

Seshadri Suresh, Indrani Suresh, Lata S

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Ultrasound has proved to be an excellent modality in the antenatal diagnosis of fetal anomalies. However, the accuracy of ultrasound in detecting anomalies varies according to the skill of the operator and the equipment used and the variable fetal and maternal conditions.

While an accurate diagnosis is possible in major structural defects, the detection of minor or associated abnormalities is less accurate. A precise diagnosis is essential to predict prognosis and the risk of recurrence future pregnancy. A postnatal evaluation of the baby is mandatory to arrive at a final diagnosis. In cases where the couple has opted for termination of the pregnancy after an abnormal ultrasound, a detailed pathological examination of the fetus and placenta may help to modify the counselling for future pregnancy management. Based on the results of the autopsy, in some cases, appropriate prepregnancy investigations can be decided and the possibility for early exclusion of a similar problem in the subsequent pregnancy can be explored.

A retrospective study was done from Jan to Dec 2006 at Mediscan systems, Chennai. A total of 606 cases had autopsy during that period. Among them, 484 had structural anomalies. Out of these, 317 had both USG and autopsy at our institution. Of these, 28% had single system anomalies and 72% had multi system/syndromic anomalies. Among single system anomalies CNS and FACE anomalies were most common. Out of 317 who had autopsy and USG, 220 had complete match, 92 had partial match and 5 had no match.

Autopsy gave more information in 30.6%. Among those anomalies wherein there was no match, ultrasound had missed the findings due to poor visibility on account of oligohydramnios, maternal obesity and multiple fibroids. Surface abnormalities were more often missed than internal defects.

Ultrasound had the best sensitivity for CNS anomalies. In the skeletal system, though the sensitivity of the ultrasound was high, the specificity was low. In Cardiovascular system, there was discrepancy in outflow tract abnormalities.

However, there are some limitations in the autopsy with regard to diagnosis of functional and karyotypic abnormalities. In the presence of autolysis, a pathological opinion may not be possible.

In conclusion, the sonologist, perinatal pathologist and geneticist should work as a team to give the most accurate diagnosis of an anomaly, which will help the couple to realize their dream of having a normal healthy child.

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MORAL AND ETHICAL ISSUES IN MONITORING A FETUS IN A WOMAN WITH ADVANCED STAGE HIV INFECTION

Keymanthrie Moodley

Advanced maternal HIV infection is characterized by a low CD4 count and a high viral load in a woman with compromised health. Such a situation may be due to natural progression of disease as a result of lack of HIV testing and antiretroviral treatment, failed treatment due to drug resistance or treatment refusal by the mother. Irrespective of the proximate cause of advanced disease, the risk of vertical transmission to the fetus in this setting is likely to be higher than in the case of early stage or treated HIV infection.

Globally, the vertical transmission risk is approximately 30% and this is reduced to less than 1% with treatment. In developing countries such as South Africa, the risk of transmission with treatment during pregnancy is 8-15%. Given these statistics, it is also possible that viral transmission may not occur in such a setting and then, one is faced with an ill mother and a healthy baby or an HIV negative baby whose health is otherwise compromised.

This scenario raises important ethical questions about balancing maternal interest against fetal interest. In the setting of an ill mother, with a distressed fetus, the treating doctor may be faced with a choice between saving the life of the mother at the expense of the fetus. The option of termination of pregnancy may thus arise either as a suggestion from the treating doctor or as a request from the mother on the basis of an autonomous choice. In the scenario where the fetus is healthy and the mother is ill with a poor prognosis, should the baby be prioritized?

Given the clinical and ethical complexity associated with advanced HIV disease in pregnancy, an important objective of care relates to prevention of this eventuality. This in turn raises the controversial question of compulsory HIV testing and treatment in pregnancy. The consequentialist argument that justifies such a viewpoint relates to the protection that would accrue to the fetus. On the other hand, individual rights of pregnant women would be infringed with resultant stigmatization. Such mandatory testing would then require a full package of care interventions that must be made available to pregnant women who are tested.

Monitoring the fetus of an unbooked mother with advanced HIV disease during labour raises challenges in terms of safety of health care workers where invasive monitoring may be required, the need for an emergency caesarian section on a mother who may pose a surgical and anaesthetic risk and the choice of resuscitating a distressed baby.

The ethical challenges of monitoring a fetus in a mother with advanced disease in the antepartum period and/or labour will hence be deliberated and elaborated in this presentation.

Keymanthri Moodley completed her medical undergraduate training at the University of KwaZulu-Natal. After 3 years of postgraduate training in internal medicine, she relocated to Cape Town and completed her specialization in Family Medicine at Stellenbosch University. Her interest in ethics led to the completion of a Masters in Philosophy in Applied Ethics. In 2004 she obtained her doctorate in medical ethics. Prof. Moodley currently heads the Bioethics Unit – Tygerberg Division at Stellenbosch University. She is vice-chair of the research ethics committee and works as a clinical trial investigator in her private capacity.

THE ETHICS OF FETICIDE AND LATE TERMINATION OF PREGNANCY

Keymanthri Moodley

Technological advances in medicine have changed the landscape of Fetal Medicine and advanced the debate on the ethics of abortion. The controversy surrounding abortion in general has been intensified in the context of late termination of pregnancy and feticide. Respecting the autonomy of the mother who may request a termination late in her pregnancy raises enormous ethical conflict for the treating obstetrician who must balance this request against the principle of non-maleficence (doing no harm) inherent in killing a viable fetus. At a more complex level, destruction of a viable fetus with significant abnormalities raises concerns of eugenics. Furthermore, is it ethically permissible to deprive an abnormal fetus of the value of a future? These controversies are globally concerning as disparate policies exist between and within nations creating ethical and practical difficulties. This presentation explores the ethical conflict and legal inconsistency in feticide and late termination of pregnancy at a global level.

Keymanthri Moodley completed her medical undergraduate training at the University of KwaZulu-Natal. After 3 years of postgraduate training in internal medicine, she relocated to Cape Town and completed her specialization in Family Medicine at Stellenbosch University. Her interest in ethics led to the completion of a Masters in Philosophy in Applied Ethics. In 2004 she obtained her doctorate in medical ethics. Prof Moodley currently heads the Bioethics Unit – Tygerberg Division at Stellenbosch University. She is vice-chair of the research ethics committee and works as a clinical trial investigator in her private capacity.

LITIGATION IN OBSTETRIC ULTRASOUND

Edward Coetzee

Now that cerebral palsy claims against the obstetrician are receding over the horizon, it seems that obstetric ultrasound has become the new target for litigation. It is after all reasonably easy to understand the anger and frustration of the parents if they have been lead to believe that all was well and suddenly a major catastrophe envelops them because of the birth of a child with a fetal anomaly. The automatic questions they ask is: could this have been detected antenatally (especially by ultrasound), and could it have been avoided? They will certainly get enough support from the legal eagles to demand answers to these questions, and if the lack of prenatal diagnosis cannot be justified then to proceed with medico-legal claims.

The answers to these questions are usually complex, but can often be frighteningly simple. A baby born without limbs or without a cranial vault (anencephaly) should not be missed even by the most basic ultrasound scan done by any doctor who uses an ultrasound machine, especially if he/she charges for this service. However problems often arise because we do not take adequate informed consent and do not give patients full explanations of what we are capable of doing and the fact that we can never guarantee a normal baby. This should preferably be in written form and the words 'a normal baby cannot be guaranteed' should form part of every ultrasound report. However this phrase will not protect you against missing obvious structural abnormalities. Most doctors doing ultrasound in South Africa have only been trained up to level 1 scanning (Basic). Attending courses does not automatically upgrade you to level 2. In most South African academic departments of fetal medicine the time given for ultrasound training of registrars is inadequate to produce a specialist at exit examination capable of level 2 scanning. A level 2 scanner must be capable of filling in the whole of the SASUOG report form (available on the website) and must have a copy (or similar) in his records and given to the patient. If this is not done they should inform their patients that they are doing a level 1 scan and tell the patients the limitations of such scanning. The patient must be specifically asked if they are satisfied with that level of scanning. In addition doctors should always be empathetic and humble about their abilities. If in doubt

always suggest referring the patients to a skilled level 3 sonologist or to a Fetal Medicine unit.

If the patient declines, make a written note in the patient records. If something is not in your notes, then legally it has not been done.

To avoid litigation a doctor must be adequately trained, write an adequate report on his/her examination, and discuss all aspects of the ultrasound scan honestly and frankly with his/her patient.

Professor Edward Coetzee is an associate Professor and sessional consultant in the department of Obstetrics and Gynaecology, University of Cape Town and Groote Schuur Hospital. He was previously head of the Fetal Medicine unit in this department, until his retirement in 2007. He has published numerous papers and editorials in peer reviewed journals and presented research papers, reviews and educational lectures at numerous National and International Congress. He is also a member of the SAMA Board of Directors and the present chairman of SASUOG.

SONOGRAPHY OF EXTRAUTERINE PELVIC MASSES

Lil Valentin

The use of grey-scale ultrasound morphology to characterize a pelvic mass may also be called 'pattern recognition'. The grey-scale ultrasound image provides us with the same information as that obtained by the surgeon or pathologist when he or she cuts a surgical specimen to see what it looks like inside. Many pelvic masses have such a typical macroscopic appearance that a fairly confident diagnosis can be made on the basis of their macroscopic appearance alone, i.e. on the basis of their grey-scale ultrasound image. This is true of most dermoid cysts, endometriomas, corpus luteum cysts, hydrosalpinges and peritoneal pseudocysts, and of many paraovarian cysts and benign solid ovarian tumours, for example, fibromas, fibrothecomas, thecofibromas, and thecomas. A mass with irregularities should always evoke suspicion of malignancy. A mass that is completely smooth is almost certainly benign. Papillary projections – considered a strong sign of malignancy – are more common in borderline tumours than in invasive cancers but may also be seen in benign tumours, for example, in adenofibromas. They explain many false-positive ultrasound diagnoses of malignancy. Pattern recognition is superior to all other ultrasound methods (e.g. simple classification systems, scoring systems, mathematical models for calculating the risk of malignancy) for discrimination between benign and malignant extrauterine pelvic masses. Today's often too liberal use of transvaginal ultrasound gives clinicians problems. Many adnexal masses that probably would have remained undetected before the ultrasound era are now found incidentally at transvaginal ultrasound examination in women without symptoms of an adnexal tumour. The natural history of incidentally detected pelvic masses with benign ultrasound morphology is not known. Therefore, the optimal management of such tumours is also unknown.

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ULTRASOUND IN PELVIC EMERGENCIES

Seshadri Suresh

Ultrasound plays a pivotal role in identifying the etiology of acute pelvic pain. In most cases, a definitive diagnosis can be offered. An understanding of the various causes of acute pelvic pain is essential for correlating the ultrasound findings and the clinical symptoms. The easy availability of ultrasound makes it as the first diagnostic modality of choice in patients with acute pelvic pain.

Emergency situations with causes in the pelvis may result from problems in the uterus like inversion or bleeding from an AV malformation. Ultrasound and colour Doppler helps in identifying an AV malformation.

One of the most common causes of pelvic emergency is ovarian hyperstimulation syndrome which causes massive enlargement of the ovaries (>10 cms) with multiple follicles. Associated findings like ascites, pleural effusion may be seen. Ovarian torsion, oophoritis, massive ovarian edema and obstruction to the ovarian vein are some of the causes where the patient may present with acute pelvic pain. Colour Doppler helps to differentiate between torsion and massive ovarian oedema. In ovarian torsion, the ovary is enlarged but retains its shape with peripheral follicles and absent colour flow signals. Massive ovarian edema results from the blockage of lymphatics due to intermittent and incomplete torsion. Colour Doppler shows increased vascularity and increase in stromal size of the ovary.

There is a decreasing incidence of ruptured ectopic pregnancy due to the liberal use of ultrasound in early pregnancy. However, in a patient with amenorrhoea and a positive pregnancy test, in the absence of an intrauterine gestational sac, a high index of suspicion of an ectopic pregnancy should be had in mind.

Non-gynaecological causes of pelvic pain include appendicitis, ureteric calculus and bowel pathology. In a patient presenting with acute pelvic pain, if gynecological causes have been excluded, it is important to exclude the abovementioned causes.

Prof. Seshadri Suresh trained at Jefferson University and Johns Hopkins (USA) in abdominal/pelvic ultrasound and Doppler. He is Visiting Professor in the Department of Fetomaternal Medicine, Jawarharlal Institute, Pondicherry, Director of Mediscan System, the first ultrasound training and research centre in South India, has delivered 400 lectures and has over 50 publications to

date, and is the author of 3 textbooks and 8 handbooks. He is Editor-in Chief of the Indian Journal of Medical Ultrasound.

DOPPLER, 3D AND 4D SCANNING IN GYNAE PRACTICE

Lil Valentin

Most of the diagnostic information needed to discriminate between benign and malignant adnexal masses is found in the gray scale ultrasound image. It is worth spending time and effort to learn to interpret the gray scale ultrasound image, i.e., to use subjective evaluation of the gray scale ultrasound image (pattern recognition) to classify adnexal masses. Studies have shown that color and spectral Doppler adds little to gray scale imaging in an ordinary tumor population. If one wants to use Doppler, the most important Doppler variable is the color content of the tumor scan. Malignant tumors are characterized by high color content and benign tumors by low color content. Pulsatility index (PI) and resistance index (RI) values in tumor vessels overlap too much between benign and malignant adnexal tumors to be clinically useful, and blood flow velocities overlap, too. Using three-dimensional (3D) power Doppler it is possible to objectively quantitate the color content of the tumor scan but also to create 3D rotating power Doppler images of the vessel tree of tumors. However, even though the color content as estimated by 3D power Doppler is higher in malignancies and even though the morphology of the vessel tree differs between benign and malignant tumors, 3D power Doppler adds little to gray scale imaging in an ordinary tumor population. It remains to be determined if 3D power Doppler adds diagnostic information in tumors that are difficult to classify as benign or malignant using pattern recognition.

A simple measurement of endometrial thickness can discriminate between women with postmenopausal bleeding at high and low risk of endometrial cancer. Endometrial thickness ≤4 mm indicates a low risk and endometrial thickness ≥5 mm a high risk. For women with postmenopausal bleeding and endometrial thickness ≥5mm, assessment of the gray scale ultrasound image of the endometrium and assessment of the color content of the endometrial scan or assessment of the morphology of the vessels in the endometrium using color Doppler can be used to refine risk estimation. Irregular internal echogenicity of the endometrium and irregularly branching endometrial vessels as depicted by color Doppler independently increase the risk of malignancy. However, endometrial thickness is an important risk factor also for women with endometrial thickness <5 mm: the thicker the endometrium the higher the risk.

A substantial proportion of subfertile women have higher impedance to flow in their uterine circulation, (i.e., higher pulsatility index, PI, in their uterine artery) than do fertile women. Higher impedance to flow in the uterine circulation appears to be associated with reduced conception rate in artificial reproductive technique (ART) cycles. This suggests that uterine impedance to flow may affect uterine receptivity. Infertile women who conceive as a result of ART are at higher risk of spontaneous abortion, preterm birth, and intra-uterine growth restriction (IUGR) than fertile women It is plausible that the pre-existing increased uterine impedance to flow and the higher risk of pregnancy complications in infertile women are interrelated. However, there is no established treatment to improve blood flow in the uterine arteries, and so the value of including measurement of uterine artery blood flow velocities in infertility investigations must be questioned.

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ULTRASOUND IN THE INFERTILE PATIENT

Lil Valentin

One in six couples seek help for infertility during their reproductive years (1). Subfertility investigation must involve as little as possible of time delay (because female fertility decreases with age) and be as little invasive as possible. Many fertility clinics use diagnostic hysteroscopy to look into the uterine cavity and evaluate the tubal ostia. Laparoscopy is also used to examine internal pelvic organs and to assess tubal patency. However, both hysteroscopy and laparoscopy are invasive and they can be replaced by transvaginal ultrasound examination. Simplified ultrasound-based infertility investigation protocols have been described (3, 4). The concept of a "pivotal" pelvic ultrasound examination includes an examination of the uterus and uterine cavity, endometrium, ovarian morphology and follicular size, blood flow in the uterus and ovaries, and hystero-contrast-sonography (HyCoSy) to check tubal patency, all performed at the same examination (3, 4, 5). The late pre-ovulatory phase of the menstrual cycle (day 8-12) is usually suggested as the optimal time to perform this examination. Most studies involving the ultrasound techniques referred to in this chapter has evidence strength Grade B (6).

References

1. Hull MGR, Glazener, CMA, Kelly NJ, Conway DI, Foster PA, Hinton RA, Coulson C, Lambert PA, Watt EM, Desai KM. Population study of causes, treatment and outcome of infertility. *BMJ* 1985; 291: 1693-1697.
2. Crosignani P, Rubin B. Guidelines to the prevalence, diagnosis and management of infertility. *Hum Reprod* 1996; 11: 1775-1807.
3. Kelly SM, Sladkevicius P, Campbell S, Nargund G. Investigation of the infertile couple: a one-stop ultrasound-based approach. Debate. *Hum Reprod* 2001; 16: 2481-2484.
4. Nargund G. Time for an ultrasound revolution in reproductive medicine. *Ultrasound Obstet Gynecol* 2002; 20: 107-111.
5. Sladkevicius P, Campbell S. Advanced ultrasound examination in the management of subfertility. *Current Opinion Obstet Gynecol* 2000; 12: 221-225.
6. Sackett DL, Richardson WS, Rosenberg W, Haynes RB. *Evidence-based Medicine. How to practice and teach Evidence-based Medicine.* Edinburgh: Churchill Livingstone, 1997.

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SONOHYSTEROGRAPHY

Elizabeth C de Coning

Sonohysterography is an easy and safe office procedure where saline is infused into the uterus under constant vaginal ultrasound visualization for the evaluation of endometrial pathology. The indication for this procedure is abnormal uterine bleeding in a patient with a thickened or irregular endometrium. This technique can decrease the need for hysteroscopy by as much as 40%, and in the case of endometrial polyps can assist in the planning of hysteroscopic dissection.

Dr E C de Coning is an gynaecologist in full time practice in Bloemfontein since 2001. Specialization was completed in 1992 at the UFS. One year sub-speciality training in Fetal Medicine and Ultrasound were done at the Catholic University of Leuven, Belgium in 1995. From 1996 to 2001 she was head of Fetal Medicine in the Department of O & G at the Faculty of Health Sciences of the UFS.

IMAGING IN UROGYNAECOLOGY AND PELVIC FLOOR DYSFUNCTION

Suran R Ramphal

Dramatic improvements in imaging techniques over the last decade have resulted in this armamentarium gaining a key role in the understanding of pelvic floor disorders. High-resolution endoanal, endorectal, dynamic transperineal and three-dimensional transvaginal ultrasound, and MRI is increasingly being used in clinical practice for patients suffering from pelvic floor dysfunction (faecal and urinary incontinence, pelvic organ prolapse, obstructed defaecation) and patients with anal and rectal pathology. These non-invasive techniques provide a superior depiction of the pelvic anatomy and also yield unique functional and dynamic information. MRI has afforded a closer view into anatomy and interaction of the female pelvic structures in women. The new tridimensional technology is revolutionizing diagnostic and therapeutic workup of patients, and is superior to 2-D ultrasound due to the elaboration of images and providing better accuracy in the diagnosis of complex diseases. All these innovations are new and exciting.

Unfortunately, at present, there is currently no evidence to prove that the use of modern imaging techniques improve patient outcome in urogynaecology and pelvic floor reconstructive surgery. Robust clinical trials are needed. Furthermore, any diagnostic method such as imaging is operator dependent and reporting is only as good as the person interpreting the findings. Therefore, teaching is important to ensure that imaging is used appropriately and effectively. An overview of imaging with benefits and shortfalls will be presented.

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ASSESSMENT OF FRACTURE RISK IN OSTEOPOROSIS – WHAT'S NEW?

Siva C Moodley

Osteoporosis is the most common bone disorder-affecting humans. It is a skeletal disorder characterised by compromised bone strength and pre-disposing a person to an increased risk of fracture. Bone strength (and hence fracture risk) is dependent on bone quality and bone mineral density (BMD). The quality of bone other than BMD is difficult or impossible to measure in clinical practice. Osteoporosis can be classified as primary (due to ageing) and secondary due to other causes, e.g. glucocorticoid therapy and hypogonadism. The primary clinical goal of osteoporosis management is to reduce fracture risk and hence the resultant morbidity and mortality.

The diagnosis of osteoporosis is based on the measurement of bone mineral density (BMD). There are a number of clinical risk factors that provide information on fracture risk over and above that given by BMD. The clinical risk factors that are useful include *fixed risk factors* (age, a prior fragility fracture, a parental history of hip fracture); *modified risk factors* (e.g. smoking and excessive intake of alcohol) and *secondary risk factors* (e.g. corticosteroid administration and rheumatoid arthritis)

The independent contribution of these risk factors can be integrated by the calculation of fracture probability with or without the use of BMD. In view of the multiple techniques available for fracture risk assessment and multiple fracture outcomes, the desirable measurement to determine intervention threshold is the 10-year probability of fracture.

Treatment can then be offered to those identified to have a fracture probability greater than an intervention threshold. The intervention threshold will vary from country to country, as it will depend on the prevailing socio-economic situation. Newer approaches to risk assessment have been published in the literature recently. One such approach by Kanis *et al* 2005 employs an algorithm based on the clinical risk factors mentioned. The clinical risk factors included in this WHO model have been validated in an analysis of 12 international cohorts (approximately 60 000 men and women). This algorithm will yield a score that will be an estimate of 10-year absolute fracture risk for an individual. As a result of this

estimate, people at higher risk of fracture will be able to take action before the first fracture occurs.

Dr S C Moodley is a Specialist Obstetrician and Gynaecologist in private practice in Durban, SA. He is also a part-time lecturer in the Department of Obstetrics and Gynaecology at the Nelson R Mandela School of Medicine and is actively involved in the FCOG Part 1 training programme. He is the co-ordinator of the CME Programme for the Durban Obstetrics & Gynaecological Society (DOGS) and Convener and Chairman for the Durban SASUOG Congress 2008.

WHAT'S NEW IN BREAST IMAGING?

Kamlesh Daji

Current revolutionary breast imaging techniques have significantly enhanced the diagnostic capabilities in breast imaging. Conventional film screen mammography has been advanced to digital mammography with computer-aided detection (CAD).

More recently developments in 3D automated ultrasound provide multiple tomographic images of the breast further adding to the existing capabilities of diagnostic breast ultrasound.

MRI of the breast, which is influenced by abnormal physiology, aids in further characterizing breast diseases into those that are benign from the sinister varieties.

Other conventional and some not so conventional modalities will also be discussed.

Dr K D Daji is a consultant radiologist in private practice in the greater Durban and Pietermaritzburg regions since 1991. He has a special interest in breast imaging.