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LITIGATION – THE IMPORTANCE OF BEING METICULOUS

Professor Edward Coetzee

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 head of the Fetal Medicine unit in this department until his retirement in 2007. He has published numerous papers and spoken at many congresses, and is a past chairman of SASUOG.

An avalanche of litigation has struck all doctors who are doing ultrasound imaging in obstetrics. This threatens to overwhelm us, and we have to turn the tide. How can we achieve this?

Firstly we need to make sure that we have received adequate training for the imaging we undertake, and secondly we need to show through continuing professional development points that our training is of an ongoing nature. Ideally we should all be accredited to do a particular level of scanning (as defined by SASUOG). However, we do not have a body that can undertake such a massive task, and we should therefore inform our patients as to what level we are trained.

In first-trimester Down syndrome screening scanning (nuchal translucency thickness) there is a body that teaches and accredits skills and maintains such skills through audit. It is indeed a foolish doctor that offers his or her patient screening for Down syndrome without such accreditation from the Fetal Professional Foundation.

One of the most important tasks that a sonologist can do is to do a systematic scan and adequately record his or her findings in real time. Keep meticulous records! The minimum standards for obstetric scanning records are on the SASUOG website for all to use. Unless something has been meticulously recorded it has not been done, and your colleagues cannot defend you.

Do not participate in boutique or studio photography. Such DVDs have often resulted in the case being indefensible because the fetal anomaly can be more easily seen in retrospective viewing.

Finally, refer any case in which there is uncertainty to a Fetal Medicine expert.

The abstracts published are those received by 19 April 2010.

INCREASED NUCHAL TRANSLUCENCY THICKNESS AND NORMAL KARYOTYPE

J B F Cilliers

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Obstetricians are often faced with the problem of what to do in cases where abnormal nuchal translucency is found with a positive screen for a chromosomal abnormality, but the resulting karyotype is normal. It is so much easier to counsel patients when the exact abnormality is known than to be faced with an uncertain diagnosis and outcome. But the picture is fortunately not that dark. If subsequent scans at 20 - 24 weeks are found to be normal, the chances of the baby being healthy can be up to 98%. However, these cases need to be evaluated by a fetal specialist and a paediatric cardiologist, as in a large percentage of cases a cardiac abnormality will be found. The problem is identifying genetic syndromes and predicting severe neurodevelopmental delay in these fetuses. Most of these diagnoses will only be made later in life and can be expected in 1.6% cases of abnormal NTs with normal karyotype. There is a correlation between the degree of abnormality in the NT and the chance of a subsequent abnormal fetus. A measured NT of 3.5 - 4.4 mm will have an 83% chance of a normal fetus, whereas an NT above 6.4 mm will only have a 20% chance of the fetus being normal. We need to know these percentages when we counsel our patients, but these can be different in populations other than those studied, especially if genetic syndromes might be more common in other populations. If such data are not available for our own population, we are given no choice but to use what data are available to us.

LATE REFERRALS, THE FETAL MEDICINE SPECIALIST'S NIGHTMARE

L de Coning

Dr Lizette de Coning (MB ChB and MMed (O&G), UFS) is a gynaecologist in private practice with a special interest in Fetal Medicine. She received her advanced Fetal Medicine training in 1995 at UZ Gasthuisberg in Leuven,

Belgium. Head of Fetal Medicine at the University of the Free State, 1996 - 2001.

The referral of pregnant patients presenting with severe congenital anomalies late in pregnancy is a grim reality that has a major impact on everybody involved. The lack of international guidelines places the responsibility for management, especially with regard to fetocide, squarely on the shoulders of the Fetal Medicine specialist.

In this talk the impact will be discussed and several factors will be identified that contribute to this reality.

RISK ASSESSMENT BY SOFT MARKERS

M du Toit

Senior Specialist in the Department of Obstetrics and Gynaecology at the University of the Free State, since 2009. Qualifications: MB ChB 1999, University of Pretoria; MMed (O&G) 2008, University of the Free State (Cum Laude). Special interest: Maternal and Fetal Medicine.

It is generally accepted medical practice that most women will have at least one ultrasound scan during their pregnancy. Apart from being an invaluable diagnostic tool, normally used to confirm viability of early pregnancy or to monitor fetal growth, it also aids in detecting fetal abnormalities (markers) associated with chromosomal abnormalities.

Markers detected on ultrasound are qualified as being either soft or major markers, according to their correlation with Down syndrome. Soft markers are often nonspecific or transient and can be readily detected on first- and second-trimester ultrasound. Soft markers are assigned a certain likelihood ratio (LR) and considered along with maternal age to provide a risk assessment for chromosomal abnormalities. The adjusted risk identifies the patient in need of confirmatory diagnostic testing.

This presentation reviews the most common soft markers found on ultrasound and their importance in screening for chromosomal abnormalities.

3D SONOGRAPHY

I Erasmus

Graduated from the University of Pretoria Medical School in 1988. Trained in Fetal Medicine at the Harris Birthright Research Unit for Fetal Medicine Unit in London, UK. Is currently in private practice at the Wits Centre of Excellence, Fetal Medicine Centre, at Morningside Hospital in Johannesburg.

Just a pretty picture?

3D ultrasound has evolved from pretty fetal facial image rendering to a useful clinical tool. To most clinicians, however, this tool is still relatively new and unfamiliar.

Information is gathered during a 2D scan using a special transducer designed for 2D scan, 3D sweep and static scan, and real time 4D scans. A 3D dataset consists of voxels whereas 2D datasets consist of pixels. Volume data are displayed in 3 planes: A plane: longitudinal, B plane: transverse, C plane: coronal.

Data are acquired in 3D/4D/Cardio STIC, with or without colour (colour, angio HDF). The volume data can be analysed directly after the acquisition on the ultrasound machine or on a PC equipped with 4D View software. Visualisation of data can be done in various forms: complete volume, tomography (VIC A or C plane and TUI), 2D section and TUI.

Volume data can be rendered in surface mode, transparency mode (max., min., X-ray), inversion mode. Various imaging tools are available to optimise visualisation: electronic scalpel, vocal, etc.

The lecture will demonstrate the various acquisition, visualisation and rendering modes and clinical application thereof.

THE UMBILICAL CORD: WHEN ARE FEARS REALISTIC?

I Faber

MB ChB (Stellenbosch University), MMed (O&G) (University of the Free State), ultrasound training at the Queen Mother's Hospital in Glasgow, Scotland, 1983/84. Head of Obstetric Ultrasound in the Department of O&G, UFS, until 1995. Served on the SASUOG committee from its inception until 1997. Currently in private practice in Bloemfontein with a special interest in ultrasound.

A cord around the neck of a fetus before birth is a condition feared by many pregnant women and their carers – but is this fear justified? In this paper various conditions related to the umbilical cord and diagnosable by ultrasound will be discussed under the following headings:

- Interesting to know cord data
- The nuchal cord
- A single umbilical artery
- Velamentous insertion of the cord and vasa previa
- Cord presentation
- Knots: False and true
- Cord varix
- Cord cysts
- Cord haematoma
- Cord tumours: haemangiomas and teratomas.

Further reading

Umbilical cord complications: Marie Helen Beal, MD; Michael G Ross, MD, MPH; updated 3 Aug 2009; emedicine.medschape.com

DOPPLER: HOW, WHICH, WHY, WHEN?

L Geerts

MB ChB and O&G (Belgium), MRCOG (UK), Diploma in Fetal Medicine (Fetal Medicine Foundation, UK), Hon BSc (Human Genetics) (SA), Subspecialist in Maternal and Fetal Medicine, Principal Specialist O&G and Head: O&G Ultrasound Unit at Tygerberg Hospital and Stellenbosch University. For 3.5 years was Consultant in Obstetrics and Fetal Medicine, King's College Hospital, London, UK, with Prof Kypros Nicolaides. National co-ordinator

for FMF–Nuchal Translucency screening programme. Has published more than 20 international peer-reviewed publications and hosted more than 15 ultrasound courses with hands-on training.

Over the years, ultrasound equipment with colour and Doppler capabilities has become widely available in obstetric practice in South Africa. Formal training in this technology has not occurred on a large scale, however, and this has raised concern that, although Doppler investigations play a significant role in modern-day fetal medicine, incorrect technique or inappropriate application of Doppler may result in harmful practice. Incorrect use and non-adherence to internationally accepted safety recommendations may cause direct harm to the developing fetus, but the potential for indirect harm is probably far greater. Incorrect technique may lead to results that are potentially falsely alarming or falsely reassuring, and inappropriate indications or incorrect interpretation may lead to unnecessary and potentially harmful interventions. For this reason, the first part of this presentation will concentrate on technical aspects of obtaining optimal and reliable Doppler results of the most commonly interrogated vessels as well as the potential pitfalls. Indications will be mentioned briefly, since most of them will be covered by other speakers, but the use of Doppler in the diagnosis of placental insufficiency in early and in late gestation as well as the detection and management of fetal anaemia will be discussed in detail.

There is convincing evidence from meta-analyses that Doppler assessment of the umbilical artery in pregnancies at high risk of placental insufficiency is of clinical benefit and improves perinatal outcome. Its results in late gestation are less reliable, however, and additional information from other vessels seems to improve the identification of the truly at-risk fetus. Routine umbilical artery Doppler screening in low-risk pregnancies is, however, not recommended.

Maximal flow velocity in the middle cerebral artery is now accepted as the best non-invasive method to detect fetal anaemia and has proved extremely useful to monitor pregnancies with red cell iso-immunisation, non-immune hydrops or fetal infection. Technical errors however almost invariably lead to underestimations of the velocity, which may result in serious fetal complications including death *in utero*. Meticulous technique and high levels of expertise are therefore required, and ideally at least one experienced practitioner should be available in all major centres in this country.

It is impossible to imagine practising fetal medicine without Doppler in the 21st century. However, all efforts should be made to reduce the potential harm from its inappropriate use.

ANEUPLOIDY SCREENING – QUO VADIS?

L Geerts

MB ChB and O&G (Belgium), MRCOG (UK), Diploma in Fetal Medicine (Fetal Medicine Foundation, UK), Hon BSc (Human Genetics) (SA), Subspecialist in Maternal and Fetal Medicine, Principal Specialist O&G and Head: O&G Ultrasound Unit at Tygerberg Hospital and Stellenbosch University. For 3.5 years was Consultant in Obstetrics and Fetal Medicine, King's College Hospital, London, UK, with Prof Kypros Nicolaides. National co-ordinator for FMF–Nuchal Translucency screening programme. Has published more than 20 international peer-reviewed publications and hosted more than 15 ultrasound courses with hands-on training.

This presentation will address the current status of aneuploidy screening in the private sector in South Africa, using information from multiple sources relating to the extent of screening, of invasive testing and of prenatal diagnosis in the year 2008. Although it is the general impression that screening for chromosomal abnormalities is widespread and efficient, the prenatal detection rate of trisomy 21 (39%), 13 (40%) and 18 (62%) is much lower than in industrialised countries or in effective screening programmes. Critical interpretation of the data indicates several areas of potential concern.

The number of women undergoing serum screening is lower than expected, the majority of ultrasound screening is performed by practitioners not specifically skilled in this area, the positive screening results are lower than expected in the first trimester, a surprisingly small number of women undergo karyotyping, and only a small proportion of the karyotypes are abnormal. The available data are indicative of under-usage of serum screening and CVS and overuse of dual testing. The data further suggest problems with pre- and post-test counselling, with correct documentation and with ultrasound skills. Suggestions for improvement in the future will be discussed and include:

- routine offering of (serum) screening with adequate counselling
- the provision of complete and accurate data to the laboratories
- performing serum screening at 10 rather than 12 or 13 weeks
- improving ultrasound skills for dating and anomaly detection
- using accredited sonographers to expand access to targeted ultrasound screening.

A significant improvement in the national prenatal detection rates in South Africa is a realistic goal that can be achieved in the near future.

TECHNIQUE OF FETAL REDUCTION AND FETICIDE

L Govender

Consultant/Lecturer in the Department of Obstetrics and Gynaecology at the Nelson R Mandela School of Medicine, University of KwaZulu-Natal. Subspecialist in Maternal and Fetal Medicine and Head of Fetal Medicine Unit at Inkosi Albert Luthuli Central Hospital in Durban. Committee member of SASUOG and Maternal and Fetal Medicine Society of SA. Council member of the College

of Obstetrics and Gynaecology (CMSA). Trained in Fetal Medicine in UK. Special interest in late termination of pregnancy.

The procedure of feticide has been in clinical practice for the past two decades. Feticide for multiple gestation is performed for two main indications: firstly, to reduce the risks associated with multiple births by reducing the number of fetuses, and secondly, for selective termination of the anomalous fetus(es). Multifetal pregnancy reduction is best performed in the first trimester of pregnancy after aneuploidy screening and confirmation of chorionicity, thus ensuring that the remaining fetus(es) is/are healthy. Selective feticide is usually performed in the late first trimester or second trimester of pregnancy, depending on the indication for the termination. Feticide also constitutes a sensitive aspect of late termination of pregnancy for severe fetal abnormality, i.e. beyond clinical viability – an issue that in itself may be contentious.

Several methods and techniques of fetal reduction and feticide with different success rates have been described in the literature. These range from endoscopic or ultrasound-guided transabdominal or transvaginal procedures such as aspiration of the gestational sac contents in the early first trimester of pregnancy and intracardiac KCl injection in the late first trimester; to umbilical cord occlusion/embolisation by various methods, intracardiac/umbilical vein injection of lethal drugs, and non-drug measures such as cardiac tamponade and heart blood aspiration at later gestations. An overview of these various techniques of fetal reduction and feticide will be presented.

PRINCIPLES IN COUNSELLING PATIENTS

B D Henderson

Dr Bertram Henderson trained as a paediatrician at University of the Free State in Bloemfontein. Since qualifying as a paediatrician in 1992, he has been employed in the Division of Human Genetics, Universitas Hospital, Bloemfontein. He is currently registered as a Medical Geneticist with the HPCSA. His particular interests are dysmorphology, chromosome disorders and counselling.

This talk is given from the perspective of genetic counseling, but the principles are generally applicable in most other settings.

The first issue to be addressed is communication skills and what makes for effective communication. The concept of active listening will be addressed as will deficiencies commonly identified in patient communication.

The steps in genetic counselling, DIAS (define the problem, inform the person, allow the person to decide, and support), will be discussed. Thereafter important principles such as non-directiveness, empathy and autonomy will be unpacked.

The talk will close with some discussion around breaking bad news to the couple.

ASSESSMENT OF THE PELVIC FLOOR

E W Henn

Dr Etienne W Henn is currently a senior specialist in the Department of Obstetrics and Gynaecology at the University of the Free State and Universitas Academic Hospital, where he is working full time in the division of urogynaecology. He has obtained the following qualifications: MMed (O et G) (Stellenbosch), FCOG (SA), CU (London). His special interest is pelvic organ prolapse surgery. He is currently working on his PhD in pelvic organ prolapse surgery.

Our understanding of pelvic floor function and dysfunction has increased significantly over the last decade. Ultrasound assessment of the pelvic floor has emerged as an exciting entity and is currently an integral part of clinical urogynaecology practice.

The pelvic floor can be assessed adequately with the use of a two-dimensional ultrasound machine, using an abdominal curved array probe. The anterior, apical and posterior vaginal compartments can collectively and individually be fully evaluated with this imaging modality. This assessment should ideally be performed in all patients presenting with pelvic floor dysfunction as an adjunct to clinical evaluation. It is also recommended that ultrasound evaluation is done to evaluate the effect of conservative management as well as the outcome and possible complications of pelvic floor reconstructive surgery. This talk will give an overview of the use of ultrasound in pelvic floor evaluation. It will aim to provide a practical approach in performing this evaluation and interpreting the findings, both in terms of diagnostic application and in terms of management planning.

AN APPROACH TO TTTS IN SOUTH AFRICA

H Lombaard

Dr Lombaard did his pre-graduate training at the University of Pretoria, graduating in 1997. He did community service at Kgapane Hospital and then trained in the Department of Obstetrics and Gynaecology, University of Pretoria. After obtaining his MMed and FCOG (SA) he stayed on as a consultant in Obstetrics and Gynaecology at Kalafong and trained in fetal medicine under Professor Bridgette Jeffery. He also spent time in Bristol under Professor Peter Soothill as a Fellow in Fetal Medicine. He obtained his registration as a subspecialist in Maternal and Fetal Medicine in 2007, and since October 2009 has been head of the Maternal and Fetal Medicine Unit at Steve Biko Academic Hospital.

Screening of twin pregnancies includes more than just screening for trisomies, and in monochorionic pregnancies includes methods to predict pregnancies at risk of developing complications. Factors that need to be evaluated are: discordance in NT, amniotic fluid and abdominal circumference. The time to screen is at the first-trimester scan and then again at 16 weeks. The placenta also needs careful evaluation to look for arterial-arterial anastomosis. Patients should be seen at 11 - 14 weeks, 16, 20, 26 and 30 weeks in units where they can

be evaluated for TTTS. In between, fetuses at risk should be seen every 2 weeks. In cases where TTTS is present, the patient should be referred to a specialised unit. The decision should then be made whether the patient will be followed up further or if laser coagulation is indicated. The decision is based on the gestational age, the cardiac function and also the rate of deterioration in the Quintero staging. At Steve Biko Academic Hospital a laser unit is being established for the management of these patients. The timing of delivery is controversial and should be between 32 and 34 weeks if laser was done and later in uncomplicated cases.

COMPLICATED TWIN PREGNANCIES

H Lombaard

Dr Lombaard did his pre-graduate training at the University of Pretoria, graduating in 1997. He did community service at Kgapane Hospital and then trained in the Department of Obstetrics and Gynaecology, University of Pretoria. After obtaining his MMed and FCOG (SA) he stayed on as a consultant in Obstetrics and Gynaecology at Kalafong and trained in fetal medicine under Professor Bridgette Jeffery. He also spent time in Bristol under Professor Peter Soothill as a Fellow in Fetal Medicine. He obtained his registration as a subspecialist in Maternal and Fetal Medicine in 2007, and since October 2009 has been head of the Maternal and Fetal Medicine Unit at Steve Biko Academic Hospital.

Growth discordance in twin pregnancies is diagnosed when there is a difference of 25% between the two fetuses. The causes of discordant growth in fetuses depend on the placentation. In monochorionic pregnancies the incidence is between 7% and 25%, with a mortality rate between 9% and 11%. The causes of growth discordance in dichorionic twins are the same as for singletons, while the causes of monochorionic twin pregnancies include the following: discordant placental sharing, discordant implantation, placental transfer of nutrients and differences in insulin-like growth factors.

Screening of twin pregnancies includes more than just screening for trisomies, and in monochorionic pregnancies includes methods to predict pregnancies at risk of developing complications. Factors that need to be evaluated are: discordance in NT, amniotic fluid and abdominal circumference. The time to screen is at the first trimester scan and then again at 16 weeks. The timing of delivery of discordant growth monochorionic twin pregnancies is controversial. Some units advocate delivery at 32 weeks but other units follow them up and deliver closer to term.

Selective intra-uterine growth restriction is classified based on Doppler of the umbilical arteries. Type 1 has positive end-diastolic flow, type 2 has absent or reversed end diastolic flow constantly and type 3 has intermittent absent or reversed end-diastolic flow. Type 3 has the highest associated perinatal mortality incidence of 15.4%. In these cases, ductus venousus and pulsatility index of the middle cerebral artery Doppler are used for prediction.

The management of selective IUGR depends on the chorionicity. In cases of monochorionic pregnancies selective cord occlusion can be done in severe cases before 26 weeks. If the patient is further than 26 weeks, admission and intensive fetal monitoring are advised. In cases of selective IUGR in dichorionic pregnancies the healthy fetus will dictate management until the intact survival of that fetus is certain, and then the sick fetus will determine when to deliver.

In cases of discordance for structural anomalies the chorionicity will also determine management. In cases of monochorionic twins selective cord occlusion is done, and in cases of dichorionic twin pregnancies intra-cardiac potassium injection is used.

SCREENING FOR PRE-ECLAMPSIA

E Nicolaou

Hypertensive diseases of pregnancy remain a leading cause of direct maternal deaths.

- Pre-eclamptic conditions represent one in three cases of severe obstetric morbidity.
- Hypertension and/or proteinuria is the leading single identifiable risk factor in pregnancy associated with stillbirth (one in five stillbirths in otherwise viable babies).
- Pre-eclampsia is strongly associated with fetal growth restriction, low birth weight, preterm delivery, respiratory distress syndrome, and admission to neonatal intensive care.
- The underlying mechanism for pre-eclampsia is impaired placentation, documented by the findings of abnormal blood flow in the uterine arteries and reduced maternal serum levels of placental products.

The patient-specific risk of developing pre-eclampsia can be predicted by a combination of factors in the maternal history, and measurements of the maternal blood pressure, Doppler assessment of the uterine artery pulsatility index (PI) (1st and 2nd trimesters), and maternal serum level of PAPP-A, PLGF and PP13 (1st trimester).

Screening by this combined approach could identify about 90% of patients developing early pre-eclampsia, with a false-positive rate of 5%.

SCREENING FOR PREMATURE LABOUR

E Nicolaou

All births before 37 weeks' gestation are defined as premature, but the vast majority of morbidity and mortality is associated with early delivery before 34 weeks, which occurs in 2.0% of pregnancies.

The main direct causes of neonatal death globally are **preterm birth**, **severe infections** and **asphyxia**.

In one-third of preterm births the delivery is carried out for medical indications, mainly pre-eclampsia and fetal growth restriction (iatrogenic). In two-thirds it is

spontaneous due to premature onset of labour or preterm pre-labour rupture of membranes.

In singleton pregnancies in women with previous preterm births the rate of recurrence is reduced by about 25% either by the prophylactic administration of progesterone or by cervical cerclage.

In singleton pregnancies in women with no previous preterm births but a short cervix (≤15 mm) diagnosed by routine ultrasonography at 20 - 24 weeks the risk of delivery before 34 weeks is very high and this is reduced by about 45% through the prophylactic administration of progesterone.

In twin pregnancies the rate of spontaneous preterm birth before 34 weeks is about 13%, compared with 1% in singletons. Randomised studies in twin pregnancies have shown that:

- Bed rest is associated with a significant increase, rather than a decrease, in the rate of early preterm birth.
- Cervical cerclage in those with a short cervix (<25 mm) doubles the risk of early preterm birth.
- Prophylactic administration of progesterone does not reduce the risk of early preterm birth.

THE FETAL BRAIN

L Pistorius

Dr Lou Pistorius completed his MB ChB (Pretoria) in 1996, and obtained the MMed (O&G) and FCOG (SA) at Stellenbosch University in 1993. After a year in the UK he returned to Pretoria to the Kalafong Hospital, where his interest in perinatology was kindled. He moved to Sandton Mediclinic as gynaecologist with interest in fetal diagnosis and therapy in 1998. Since 2004 he has been working in the University Medical Centre in Utrecht, The Netherlands. He otained his PhD on fetal brain imaging in 2008.

Visualisation

The brain is the only fetal organ with a constantly changing appearance during gestation. Basic evaluation of the fetal brain is done in three axial planes:

- Transventricular: skull, midline, falx, cavus septi pellucidi, lateral ventricles, head circumference, ventricular atrium
- Transventricular: + thalami, hippocampal gyrus
- Transcerebellar: + cerebellar hemispheres and vermis, TCD, cisterna magna.

A more detailed neurosonographic evaluation is done in additional coronal and sagittal planes, visualised ideally with transvaginal ultrasound through the anterior fontanelle.

Coronal:

- Transfrontal: interhemispheric fissure, frontal cortex in front of lateral ventricles, orbita, sphenoid
- Transcaudate: genu corpus callosum, cavum septi pellucidi, frontal horn of lateral ventricles, caudate nucleus, Sylvian sulcus
- Transthalamic: thalami, third ventricle, atrium lateral ventricle with choroid plexus
- Transcerebellar (via posterior fontanelle): posterior horn of lateral ventricles, tentorium, cerebellar hemispheres and vermis.

Sagittal:

- Midsagittal: corpus callosum, cavum septi pellucidi, brainstem and pons, 4th ventricle, vermis
- Parasagittal: lateral ventricle, choroid plexus, periventricular area, cortex.

To understand **developmental abnormalities**, it is useful to understand the different embryological stages of brain development (see table below).

Acquired problems include:

- Hypoxia (porencephaly, hemi-atrophy, hydranencephaly)
- Ischaemia (periventricular leucomalatia)
- Metabolic destructive
- Toxic
- Infection/inflammation (e.g. TORCH, Parvo B19)
- Germinal matrix bleeding.

Literature

Malinger G, Monteagudo A, Pilu G, Timor-Tritsch IE, Toi A. Sonographic examination of the fetal central nervous system: guidelines for performing the 'basic examination' and the 'fetal neurosonogram'. Ultrasound Obstet Gynecol 2007; 29(1): 109-116.

CYSTIC SPACES IN THE ABDOMEN

L Pistorius

Dr Lou Pistorius completed his MB ChB (Pretoria) in 1996, and obtained the MMed (O&G) and FCOG (SA) at Stellenbosch University in 1993. After a year in the UK he returned to Pretoria to the Kalafong Hospital, where his interest in perinatology was kindled. He moved to

Stage	(Gest.) age	Development	Anomalies
Dorsal induction	5 - 6 wks	Closure of neural tube	Anencephaly, encephalocoele, Chiari malformation, spina bifida
Ventral induction	7 - 12 wks	Formation of brain segments and face	Holoprosencephaly, corpus callosum agenesis, vermian agenesis, facial abnormalities
Migration and histiogenesis	12 - 24 wks	Migration of neurons from periventricular germinal matrix to cortex; cortical organisation	Gray matter heterotopias (e.g. schizencephaly, lissencephaly, polymicrogyria); phacomatosis (e.g. neurofibromatosis, tuberous sclerosis)
Myelination	24 wks - 3 yrs	Myelination	Dysmyelination

Sandton Mediclinic as gynaecologist with interest in fetal diagnosis and therapy in 1998. Since 2004 he has been working in the University Medical Centre in Utrecht, The Netherlands. He otained his PhD on fetal brain imaging in 2008.

The differential diagnosis of cystic spaces in the fetal abomen includes:

- Urorenal:
  - pyelectasis
  - multicystic renal disease
  - obstructive uropathy
  - urachal cyst.
- Genital:
  - ovarian cyst
  - hydrometrocolpos.
- Gastro-intestinal:
  - bowel (atresia, volvulus, malrotation, enteric duplication, meconium cyst, mesenteric cyst)
  - liver/bile ducts (gallbladder, choledochal cyst, hepatic cyst).
- Other:
  - umbilical vein varix
  - anterior meningocele
  - neuroblastoma
  - sacrococcygeal teratoma
  - ascites
  - lymphangioma.

The management of the most common causes will be discussed, including:

Pyelectasis

- 5 - 10 mm at 20 wks, no calyceal dilation – 95% chance of resolution
- Mild increased risk of chromosomal abnormalities (see soft markers).

Obstructive uropathy

- Differential diagnosis megacystis megacolon, intestinal hypomotility syndrome
- 12 wks:
  - megacystis 7 - 15 mm: 20% risk of trisomy; if chromosomally normal 90% chance resolution
  - >15 mm: 10% risk of trisomy; if chromosomally normal 'always' progressive obstructive uropathy
- 20 wks: 20% chance of trisomy
- Stenting in context of RCT (PLUTO).

Ovarian cyst

- Usually appears in third trimester; size thereafter relatively unchanged
- 50% spontaneous resolution, >90% if <50 mm diameter
- 35% complicated by torsion bleeding
- If bleeding: calculate Hb deficit from volume/expected fetoplacental volume, check mca vmax
- Caesarean section for usual indications, not for cyst
- Neonatal aspiration (90% regression) or cystectomy.

Bowel obstruction

- Duonenal atresia: double bubble, 30 - 40% trisomy
- Jejunal/ileal atresia: 'no' increased risk
- Cave volvulus (decreased fetal movements, increased dilation).

PREDICTING SURVIVAL AND MENTAL AND MOTOR FUNCTIONING IN CHILDREN WITH CNS ABNORMALITIES

L Pistorius

Dr Lou Pistorius completed his MB ChB (Pretoria) in 1996, and obtained the MMed (O&G) and FCOG (SA) at Stellenbosch University in 1993. After a year in the UK he returned to Pretoria to the Kalafong Hospital, where his interest in perinatology was kindled. He moved to Sandton Mediclinic as gynaecologist with interest in fetal diagnosis and therapy in 1998. Since 2004 he has been working in the University Medical Centre in Utrecht, The Netherlands. He otained his PhD on fetal brain imaging in 2008.

Prediction of functioning is always a risky business, and is affected by many factors, such as the underlying pathology of the central nervous system, the presence of associated abnormalities, and even the gestational age (with a greater risk of associated abnormalities and intra-uterine death with the same diagnosis earlier in the pregnancy.) However, risks of associated chromosomal abnormalities and adverse outcome can be given empirically. Some examples are given (for a gestational age of 20 wks):

Spina bifida

Associated chromosomal abnormality in 1 - 5% (if no associated abnormalites). If lowest intact vertebra at L3 or higher:

- 60% chance of death
- 25% chance of mental retardation and poor mobility
- 15% chance of normal mental functioning and good mobility.

If lowest intact vertebra at L4 or lower:

- 25% chance of death
- 25% chance of mental retardation and poor mobility
- 50% chance of normal mental functioning and good mobility.

Ventriculomegaly

Extracranial abnormalites in 33% (regardless of degree of ventriculomegaly). If isolated: 2% chance of chromosomal abnormality in mild ventriculomegaly (11 - 12 mm); 10% otherwise.

Prognosis:

- 11 - 12 mm (mild ventriculomegaly): 98% survival, of which >90% normal development
- 13 - 15 mm (moderate) 80% survival, of which 75% normal development

- >15 mm (severe): 33% survival, of which 60% normal development.

Better prognosis in male fetus with normalisation of ventricle size.

Corpus callosum agenesis

Other structural and/or chromosomal abnormalities in 70% of fetuses. Developmental delay in up to 40% of remainder:

- 25% of fetuses with ventricular atrium <5 mm
- >90% of fetuses with ventricular atrium >15 mm.

Literature

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NON-IMMUNE HYDROPS FETALIS

Marise Pretorius

Hydrops fetalis refers to the presence of two or more of the following fetal fluid collections: ascites, pleural effusion, pericardial effusion, skin oedema and polyhydramnios.

The widespread use of Rh(D) immune globulin has dramatically decreased the prevalence of Rh(D) allo-immunisation. The result is that NIHF has become responsible for almost 90% of hydrops cases.

The diagnosis, including ultrasound examples, pathogenesis and associated disorders, will be discussed together with the prognosis and a management plan.

CHROMOSOMAL SCREENING USING DIFFERENT ALGORITHMS

D Sankar

Consultant Obstetrician and Gynaecologist in private practice in Durban. He has a special interest in Fetal Medicine.

First-trimester screening for Down syndrome has been functional in South Africa for approximately 10 years. The main programme used was that provided by the Fetal Medicine Foundation (FMF). Only FMF-accredited sonographers are licensed to utilise the programme. In the private sector, certain laboratories were also given this licence with the proviso that the ultrasound assessments were performed by FMF-accredited sonographers. The private laboratories however, 'under pressure from our obstetricians', allowed access to the programme to all obstestricians (accredited and non-accredited). The important information required was a CRL and an NT measurement and the laboratory provided the risk assessment. The FMF has withdrawn all laboratories' licences. The laboratories have now introduced an alternative programme for sonographers who are not accredited with the FMF. Some differences have been noted and will be highlighted in the presentation.

CARE DURING THE TERMINATION OF PREGNANCY – A MIDWIFE'S PERSPECTIVE

C Schmidt

Sr Carlé Schmidt achieved her BSocSc and Advanced Nursing degrees at the University of the Free State. She works as a professional registered nurse in the Intrapartum Care Unit of Medi-Clinic Bloemfontein. Yalad, her private and part-time practice, teaches antenatal classes. She is married with three daughters. Obstetrics is her passion.

The midwife becomes the primary caretaker of the patient during the termination of pregnancy. To be able to provide the necessary care and support in long and trying ordeals such as these, midwives need to be carefully chosen. Those who object to termination should not be considered. Staff involved in the termination process must be constricted to the same nursing personnel, in order to provide continuous care, to form trust relationships, and to ensure that patients are not isolated from care and contact.

Careful consideration should be given to basic physical nursing and the facilitation of good basic hygiene in situations where pregnancies are terminated, as patients can be in labour for one to four days. Those having epidurals for multiple days must receive good pressure care. Unnecessary vaginal examinations are to be avoided. The patient should be nursed in a comforting way, as to bridge the gap between what is physically happening and the emotional stress she is experiencing. The greatest role of the midwife is that of emotional support. She must be available for the patient, in order to provide non-judgemental support and to help the patient cope with emotions of guilt, regret and heartache.

A sensitive approach is to be followed during the delivery of the fetus. The patient should be prepared for the fact that the fetus can live for a while after birth. A combined strategy for these circumstances should be instituted beforehand by the midwife and the patient, with regard to what should happen during and after the birth. The midwife guides the patient, especially where abnormalities are involved, with regard to how the patient should connect with the fetus. It is also the midwife's responsibility to collect memories of the life that has passed away. This is done in the form of hand- and footprints, or the collection of a lock of hair in situations where abnormalities are severe. If abnormalities are internal, a photo is taken. These tokens are given to the obstetrician even if the parents do not want to see them, as 85% of patients who terminated a pregnancy will want some tangible proof of life later on – within three months or so.

Patients are usually discharged within 24 hours after the termination and delivery are completed. Patients should be put into contact with a support group, psychologist, or

church group for continued support in the time following the delivery of the fetus. Prior to this, the midwife is the patient's main lifeline, as well as her companion in a dark hour. In the world of the midwife this great privilege comes with great responsibility.

RISK IMPLICATIONS FOR THE UNBORN CHILD IN HIV PATIENTS

L Smith

Dr Louise Smith, BSc, MB ChB, MMed O&G, is Senior Specialist, Pelonomi Hospital, University of the Free State. She qualified 5 years ago and has been working in the Department of Obstetrics and Gynaecology, Pelonomi Hospital and University of the Free State. She is the acting Head of Department in Pelonomi Hospital. Her particular interest pertains to high-risk obstetrics and HIV-infected women.

During 2006, 33 033 women attending 1 415 antenatal clinics throughout South Africa tested HIV positive – they comprised 29.1% of pregnant women. Infants born to women living with HIV can become infected during pregnancy, labour and breastfeeding. Doctors caring for patients with HIV are faced with new challenges and decisions: what to do with a positive Down screening in the HIV infected pregnant women?; does HIV infection *per se* increase congenital malformations?; the safety of antiretroviral drugs in pregnancy. The speaker will try to highlight some of these important aspects regarding the risk implications for the unborn child in HIV patients.

IMAGE OPTIMISATION IN THE DIFFICULT PATIENT

C Stewart

Senior Specialist at Groote Schuur Hospital, Cape Town, she heads the Fetal Medicine and Ultrasound units. Her interests are in preterm labour, counselling and management of fetal anomalies, and patient attitudes to ultrasound and abnormal findings.

The basis of ultrasound image optimisation lies in knowledge of your ultrasound machine. All machines have different controls and 'knobology'. Care of the machine and probes is important to avoid 'drop-out' in image.

Frequency adjustment: For deeper structures or obese patient, decrease frequency. However, this does come at the expense of resolution.

Focal zone: Must be at the level of the point of interest. Multiple focal zones are sometimes useful.

Gain: Two different types of gain – overall gain and time gain compensation (TGC).

Depth and magnification or zoom: Know what types of zoom your machine has, as some can decrease resolution.

Power selection: While we usually use 100% power, lowest reasonable output should be used to maintain good picture quality.

There are specific differences between imaging the heart and non-cardiac structures. Cardiac visualisation involves maximising the difference between myocardium and blood pools. This involves maximising the frame rate. Applications such as tissue harmonics and speckle reduction are also useful.

Colour Doppler settings will also be discussed.

DELIVERING A FETAL MEDICINE SERVICE IN A RESOURCE-POOR SETTING

C Stewart

Senior Specialist at Groote Schuur Hospital, Cape Town, she heads the Fetal Medicine and Ultrasound units. Her interests are in preterm labour, counselling and management of fetal anomalies, and patient attitudes to ultrasound and abnormal findings.

A Fetal Medicine service is based on a good routine ultrasound service. Challenges to providing this in South Africa include: insufficient funding for ultrasound equipment, insufficient trained personnel, patients booking late, and patients not having money to travel to attend clinics. Several studies have shown benefit in providing an obstetric ultrasound service in low-resource settings. A Rwandan study showed that introduction of ultrasound services to two rural areas resulted in a change in patient management plans in 43% of patients scanned. A South African study showed improvement in obstetric outcomes with routine scanning.

Possible solutions to the resource issues

- Portable ultrasound machines
- Sonographers at community sites
- Telemedicine
- Accelerated training programmes.

Fetal Medicine

Screening for chromosomal and structural abnormalities is one of the main focuses of Fetal Medicine.

While there are many other causes of poor perinatal outcome in low-income countries, chromosomal abnormalities are equally common in affluent societies and low-income countries. The burden to families is greater in countries with limited resources because of insufficient support services. It is therefore essential to identify pregnancies at high risk for chromosomal abnormalities using methods which will provide good sensitivity while minimising the number of procedures, thus avoiding procedure-related complications and laboratory costs. Screening programmes will be discussed.

Fetal therapies are useful in conditions such as rhesus iso-immunisation and twin-twin transfusion syndrome. These are not easily available in South Africa, so management has to be adapted.

Fetocides for serious abnormalities are performed in Fetal Medicine units throughout South Africa, with a rate of approximately 300 per year. Ethical issues and resource constraints which affect this service will be discussed.

Conclusion

While there are challenges to providing a Fetal Medicine services in a resource-poor setting, careful planning by academic units and governmental and academic organisations can address many of these.

DIAGNOSTIC ALGORITHM FOR UTERINE PATHOLOGY

T van den Bosch

Thierry van den Bosch received his degree in Medicine at the Katholieke Universiteit Leuven (Belgium) in 1987. His specialist training in Obstetrics and Gynaecology included one year at Kalafong Hospital, University of Pretoria, under the supervision of Professors J Knobel and G Lindeque. After graduating as a specialist in Obstetrics and Gynaecology he worked in the department of Professor H J Odendaal at Stellenbosch University and Tygerberg Hospital from 1992 until 1994. There he started his clinical research on the diagnosis of endometrial and intracavitary uterine pathology that led to his PhD thesis entitled 'Towards an improved diagnosis of uterine pathology' (Leuven, 2007). He is currently practising as a gynaecologist at the Regional Hospital Heilig Hart in Tienen and as consultant in the Department of Obstetrics and Gynecology, University Hospitals Leuven, where he is running the 'Bleeding Clinic'. He is co-ordinating the International Endometrium Tumor Analysis (IETA) research group.

For many years, dilatation and curettage (D&C) has been the method of choice to assess the endometrium. However, D&C necessitates general anaesthesia and, because it is a blind procedure, lesions may be missed. Various office-based tests have been developed to assess the endometrium.

Cervical cytology may incidentally give a hint as to the presence of an intracavitary lesion, but cannot rule out uterine malignancy or other uterine pathology.

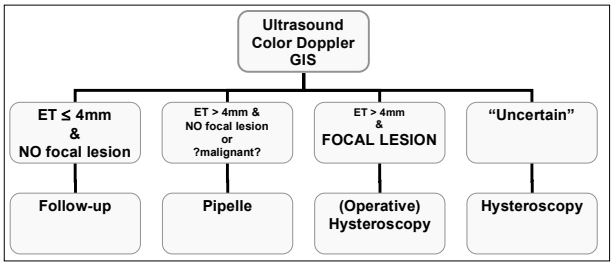
The endometrium can be evaluated in a non-invasive way by (transvaginal) ultrasonography. Endometrial cancer is associated with a thickening of the endometrium. In contrast, if a thin and regular endometrium is visualised, malignancy is most unlikely. Endometrial polyps are relatively prevalent in peri- and postmenopausal women; most polyps remain asymptomatic. Polyps are more easily visualised in the proliferative phase of the cycle against a hypo-echogenic endometrial background. Using colour Doppler imaging, the visualisation of a distinct pedicle artery running deep into the endometrial lining is strongly suggestive of an endometrial polyp. To enhance the diagnostic accuracy for focal intracavity lesions such as endometrial polyps or submucous myomas, a negative contrast agent such as saline or gel may be injected into the uterine cavity during ultrasound: the saline or gel instillation sonohysterography.

Office endometrial sampling, e.g. using a Pipelle®, is accurate in the diagnosis of endometrial hyperplasia and endometrial malignancy. However, most focal lesions such as polyps will be missed.

Office hysteroscopy is very reliable in the diagnosis of focal lesions such as endometrial polyps and intracavity myomas, but is less accurate for diagnosing endometrial hyperplasia and cancer.

When investigating the patient's preference, vaginal ultrasound was the best accepted procedure, followed by hydrosonography, outpatient hysteroscopy and office endometrial sampling, respectively.

The algorithm below for the diagnosis of uterine pathology in a 'one-stop clinic' setting is suggested, based on ultrasound with colour Doppler imaging and gel contrast sonography as initial investigations. Pipelle® endometrial sampling to exclude more diffuse pathology such as endometrial hyperplasia and malignancy may be performed at the same visit. In cases where ultrasound, hydrosonography or endometrial biopsy do not provide conclusive information, a diagnostic office hysteroscopy is indicated.



ULTRASOUND 'SCREENING' FOR GYNAECOLOGICAL MALIGNANCIES

T van den Bosch

Screening for a disease is useful if its incidence is high, if the disease leads to high mortality/morbidity, if there is a treatable precursor, and if there is an available, accurate, patient-friendly and economically affordable screening test.

Unlike cytology testing for cervical cancer, ultrasound has not yet proven to fulfil these criteria in the screening for endometrial or ovarian cancer. However, because ultrasound is being more and more frequently used in general gynaecological practice for an increasing number of indications, findings such as a 'thickened endometrium' or a polyp in a patient without abnormal bleeding, or a clinically unsuspected adnexal mass, are incidentally seen.

There is therefore a need for evidence-based guidelines for the management of such incidental findings at pelvic ultrasound.