

Conclusions: Use of ultrasonography to manage ovarian pathology avoided unnecessary intervention. Complications were rare and no invasive cancers were diagnosed. Our data are prospective and provide justification for larger appropriately powered studies to define the behaviour of ovarian pathology in pregnancy.

OC04.07

Presurgical assessment of adnexal masses: performance of IOTA-LR2, ADNEX and RMI models and added value of tumour marker-based models ROMA and CPH-I

N. Carreras Diéguez, M. Munmany, N. Agusti, P. Fusté, A. Glickman, B. Gil-Ibáñez, J. Pahisa, A. Torne

Gynecology Department, Hospital Clinic, University of Barcelona, Barcelona, Spain

Objectives: To study the diagnostic accuracy of ultrasound-based models (IOTA-LR2, ADNEX, RMI) and the added value of tumour marker-based models (ROMA, CPH-I) in presurgical assessment of adnexal masses.

Methods: Retrospective study including a cohort of women who underwent surgery for adnexal masses in Hospital Clínic de Barcelona between 2005 and 2017. According to histological findings, we defined two study groups: (1) patients harboring epithelial ovarian cancer or ovarian metastases and (2) patients harboring epithelial benign, borderline or non-epithelial adnexal masses. Such classification was made because of the differences in the clinical management between both groups. We calculated the values of IOTA-LR2, ADNEX, RMI ROMA and CPH-I for each patient. We plotted ROC curves for the studied models. Sensitivity, specificity and predictive values for such models were computed at different cutoff points. We computed as well sensitivity and specificity of different combinations of ultrasound-based models and tumour marker-based models (IOTA and ROMA, ADNEX and ROMA, IOTA and CPH-I, ADNEX and CPH-I combinations).

Results: 831 patients were included: 685 (82,5%) presenting benign epithelial or non-epithelial adnexal masses and 146 (17,5%) with epithelial ovarian cancer or metastases. ADNEX showed the highest AUC (0,96%). ROMA showed the highest sensitivity (96,7%) while the most specific models were RMI (96,0%) and CPH-I (90,6%). Sensitivity rose up to 97,4% using a combination of ADNEX and CPH-I, with an acceptable specificity of 81,4%.

Conclusions: Given the importance of avoiding false negatives because of its negative impact on prognosis, the combination of CPH-I and ADNEX (which includes not only ultrasound features but the value of HE4 and Ca125 tumour markers as well) showed the best profile for presurgical assessment of adnexal masses. Such combination of models is currently used in our centre in order to assess the cases with inconclusive diagnosis after evaluation by a specialised ultrasonographer.

OC05: ULTRASOUND IN THE LABOUR WARD

OC05.01

Rotational forceps delivery: a novel role of intrapartum ultrasound for quality control and teaching

L. Hinkson¹, W. Henrich², B. Tutschek³

¹Obstetrics, Charite University Hospital, Berlin, Germany;

²Department of Obstetrics, Charité, Berlin, Germany;

³Prenatal Zurich, Zurich, Switzerland

Objectives: Operative vaginal delivery and in particular rotational forceps delivery require extensive training, specific skills and

dexterity. We report the use of intrapartum ultrasound during delivery using Kielland's forceps, aiming to improve fetal and maternal safety.

Methods: Ultrasound-guided rotational forceps delivery using Kielland's forceps were performed in a series of spontaneously labouring women with normal fetuses and arrest of labour in the late second stage and with a fetal head malposition.

Results: All fetal head stations as determined by intrapartum US were ≥ 0 cm, corresponding to an angle of progression of $\geq 116^\circ$. Fetal head positions were occiput posterior in 37.5%, left occiput transverse in 31.3%, right occiput transverse in 28.1% and left occiput posterior in 3.1%. All fetal heads were successfully rotated to an occiput anterior position, and vaginal delivery was achieved in all women. There were no cases of difficult application, repeat application or slippage of the blades or rotation of the fetal head in the wrong direction. The average maternal blood loss was 300ml. There were no vaginal or cervical tears. There were no fetal deaths or lacerations.

Conclusions: Ultrasound guidance during operative vaginal delivery, specifically during rotational forceps delivery, is a novel approach that may enhance safety and potentially reduce the number of Caesarean deliveries in late second stage.

Supporting information can be found in the online version of this abstract

OC05.02

Movement of the fetal head during active pushing assessed with ultrasound

B.H. Kahrs^{1,2}, S. Usman³, T. Ghi⁴, A. Youssef⁵, E. Torkildsen⁶, E. Lindtjørn⁶, T.B. Østborg⁶, S. Benediktsdóttir^{7,8}, L. Brooks⁹, L. Harmsen⁹, K. Å. Salvesen^{1,2}, C. Lees¹⁰, T.M. Eggebø^{1,2}

¹National Centre for Fetal Medicine, St Olavs Hospital, Trondheim, Norway; ²Institute of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway; ³Fetal Medicine, Queen Charlotte's and Chelsea Hospital, Imperial College London, London, United Kingdom; ⁴U.C. Ostetricia e Ginecologia, University of Parma, Bologna, Italy; ⁵Obstetrics and Gynecology, University of Bologna, Bologna, Italy; ⁶Department of Obstetrics and Gynecology, Stavanger University Hospital, Stavanger, Norway; ⁷Department of Obstetrics and Gynecology, Landspítali University Hospital, Reykjavik, Iceland; ⁸Department of Obstetrics and Gynecology, Lund University Hospital, Lund, Sweden; ⁹Department of Obstetrics and Gynecology, Hvidovre University Hospital, Copenhagen, Denmark; ¹⁰Imperial College Healthcare NHS Trust, London, United Kingdom

Objectives: To investigate if movement of the fetal head assessed with transperineal ultrasound during active pushing was associated with the duration of operative vaginal delivery, mode of delivery and neonatal outcome in nulliparous women with prolonged second stage of labour.

Methods: A prospective cohort study was conducted between November 2013 and July 2016. Women were included in six departments in five countries. Fetal head movement was measured with transperineal ultrasound. Head-Perineum Distance (HPD) was measured between contractions and during maximum contraction during active pushing, and the difference was calculated as delta-HPD. We delta-HPD was differentiated into quartiles. The main outcome was duration of operative delivery. Secondary outcomes were mode of delivery and neonatal outcome.

Results: 204 women were included. We found a significant association between delta-HPD and duration of vacuum extractions. The adjusted hazard ratio for vaginal delivery using delta-HPD as continuous variable was 1.04 (95% CI 1.01-1.08). Mean delta-HPD was 7 mm (-10 to 37). Delta-HPD was either negative or ≤ 2 mm in the lowest quartile. Overall, 7/50 (14%) were delivered with Caesarean section in this group compared to 8/154 (5%) if delta-HPD was > 2 mm ($p < 0.05$). There was no significant association between umbilical artery pH and delta-HPD groups.

Conclusions: Lack of fetal head movement during active pushing assessed with transperineal ultrasound was associated with longer duration of operative vaginal delivery and higher frequency of Caesarean section.

Supporting information can be found in the online version of this abstract

OC05.03

Ultrasound in the second stage of labour before instrumental vaginal delivery: a randomised controlled trial

J.G. Barros¹, M. Carvalho Afonso², A.T. Martins³, A.I. Carita⁴, N. Clode¹, D. Ayres-de-Campos¹

¹Department of Obstetrics, Gynecology and Reproductive Medicine, Santa Maria University Hospital, Lisbon, Portugal; ²Fetal Medicine Unit, St George's Hospital, London, United Kingdom; ³Maternity Dr Alfredo da Costa, Lisbon, Portugal; ⁴University of Lisbon, Lisbon, Portugal

Objectives: To evaluate the impact of performing a previous intrapartum ultrasound on the efficacy of an instrumental vaginal delivery (vacuum or forceps), more specifically on the incidence of neonatal and maternal morbidity.

Methods: A randomised controlled trial was conducted, between October 2016 and March 2018, in two tertiary care maternity hospitals in Lisbon. Women with term singleton pregnancies in cephalic presentation, with an indication for instrumental vaginal delivery (vacuum or forceps) were approached for enrolment in the trial. After informed consent, 1:1 randomisation into two groups occurred: in the experimental arm, women were submitted to transabdominal ultrasound for determination of occiput position and transperineal ultrasound for evaluation of the 'angle of progression'; in the control arm, only digital vaginal examination was performed. The primary outcome was a composite of maternal morbidity, including the presence of severe hemorrhage, perineal trauma and prolonged hospital stay; and a composite of fetal morbidity, including umbilical artery metabolic acidosis, birth trauma and admission to the neonatal intensive care unit.

Results: A total of 233 women were randomised and 222 were included in the final analysis (113 in the experimental arm and 109 in the control arm). No significant differences between the groups were found in the composite maternal and neonatal morbidity outcomes ($p = 0.529$), nor in any of the individual outcomes. The incidence of null maternal and neonatal morbidity was 40.9% when the instrumental delivery was preceded by ultrasound and 33.3% in the control arm (odds ratio 1.227; 95% confidence interval 0.685-2.198).

Conclusions: Transabdominal and transperineal ultrasound, performed before instrumental vaginal delivery did not significantly reduce adverse maternal and neonatal outcomes.

OC05.04

Dynamic two-dimensional transperineal ultrasound prior to perineal suturing as a screening tool for anal sphincter injury and fecal incontinence

G. Salsi, F. Bellussi, E. Montaguti, M. Dodaro, E. Margarito, G. Di Donna, L. Cariello, G. Pili

Obstetrics and Gynecology, S.Orsola-Malpighi University Hospital, Bologna, Italy

Objectives: To evaluate the feasibility and accuracy of two-dimensional transperineal ultrasound (2D-TPUS) immediately after delivery and prior to perineal tears repair; to assess women's ability to contract the anal sphincter after delivery and its correlation with anal incontinence.

Methods: A non-consecutive series of primigravidae with low-risk singleton term pregnancies were recruited after delivery. For each patient a clinical evaluation of the perineum and a further 2D-TPUS were carried out. Before perineal repair women were asked to contract the anal sphincter during 2D-TPUS and were divided into two groups: women with inability to contract (group A) and women with evidence of contraction at ultrasound (group B). A follow-up examination with 4D-TPUS was carried out 4-5 months after delivery.

Results: 69 women were enrolled: In 14 cases (20%) it was not possible to identify anal sphincter contraction at dynamic 2D-TPUS (group A), while in 55 women (80%) there was evidence of proper anal sphincter contraction (group B). Obstetric anal sphincter injury (OASIS) detected through perineal inspection was significantly more frequent in group A than in group B (13/14, 93% vs. 7/55, 12%, $p < 0.001$). At the 4-5 month postpartum evaluation, all previously recognised OASIS were correctly repaired, while an OASIS not previously noted at clinical examination in the delivery room was diagnosed by means of 3D-TPUS. Anal incontinence was reported in 8/69 patients (11%) and was more frequent in group A (4/14, 29% vs. 4/55, 7%, $p 0.047$). Epidural analgesia rate was not significantly different between the two groups.

Conclusions: Post-partum 2D-TPUS is a feasible technique and a useful supporting tool for the assessment of anal sphincter integrity. Anal incontinence at 4-5 months post-partum is more frequent among women who are unable to perform an anal sphincter contraction detectable at ultrasound after delivery.

OC05.05

Moulding of the fetal head diagnosed with ultrasound

T.M. Eggebo^{1,3}, J.K. Iversen², B.H. Kahrs^{1,3}, A.F. Jacobsen², E. Torkildsen⁴

¹National Centre for Fetal Medicine, St Olavs Hospital, Trondheim, Norway; ²Department of Obstetrics and Gynecology, Oslo University Hospital, Oslo, Norway; ³Institute of Clinical and Molecular Medicine, Norwegian University of Science and Technology, Trondheim, Norway; ⁴Department of Obstetrics and Gynecology, Stavanger University Hospital, Stavanger, Norway

Objectives: Moulding means reshaping of the fetal head and is caused by overlap of the skull bones. The aim of the study was to compare fetal head moulding in occiput anterior (OA) and non-OA positions, and to study associations between moulding and mode of delivery.

Methods: We conducted a prospective cohort study between November 2013 and July 2016. Women were included at university hospitals in Stavanger and Trondheim. Fetal head moulding was studied with transperineal ultrasound. Moulding in OA and occiput posterior (OP) positions are shown in the figure. We measured the distance from the moulding to the midline, the moulding step and the overlap of the skull bones. Analyses were performed offline in stored 2D images and in 3D volumes.

Results: The study population comprised 150 women, and position was diagnosed with ultrasound in 144 cases. Moulding was significantly more often seen in OA positions than in non-OA positions; 69/117 (59%) vs. 10/27 (37%); $p = 0.04$. The mean distance from the midline to the moulding was 15.9 mm vs. 9.0 mm ($p < 0.05$), the moulding step was 4.1 mm vs. 4.8 mm