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delivery system with PalmPump (Clinical Innovations, Utah, USA). Five vacuum extractions were applied: 4 of them were performed for failure to progress and one case for non-reassuring fetal heart monitoring.

Results: Before applying the vacuum cup, head station, position and head descent during contraction were determined using the LaborPro system. Three cases were of occiput anterior position and 2 cases of occiput posterior. Head station measurements and head descent during contraction were reported in the table. All the vacuum procedures were successful in at last three tractions.

Conclusions: Using accurate and objective ultrasound-based and position tracking system data before vacuum cup application and during the extraction of the fetus, might reduce the failure rates of vacuum procedures, consequently maternal and fetal morbidity and reassuring the operator who carried out the procedure.

P16.05: Table

Cases	Occiput position	Head station at rest	Head station during pushing
1	OAP	1.4	1.8
2	OAP	1.6	2.3
3	OAP	1.2	2.3
4	OPP	1.8	2.9
5	OPP	1.1	2.4

P16.06

Inter- and intra-operator variability of angle of progression measurement on a robotized model

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Objectives: To evaluate the variability of measurements of the angle of progression in a robotized model with a fetal head and a maternal pelvis.

Methods: We designed a model with a fetal head moving through a maternal pelvis using an industrial robot (IRB 140 Robot, ABB ltd, Zurich, Switzerland) programmed for 12 different settings: all four oblique positions in stations -1, 0, +1. Three different operators made repeated measurements of the angle of progression using the 2D and 3D modes, three times, for all settings, using the SonoVCADTM labor system (Voluson i, GE Medical). The robot put the head back in a neutral 'out of the pelvis' setting between all measurements and subsequently in the requested setting. Measurements were analyzed using the coefficient of variation for intra- and inter-operator variability.

Results: 216 measurements were recorded. The mean angles of progression for all measurements were 91°, 101°, and 113° for station -1, 0, and +1 respectively. Figures were identical for when using 2D and 3D. Intra- and inter-operator variability for each setting, station or position was constantly below 5%.

Conclusions: In a model using a robotized fetal head programmed for different fetal head stations and positions, the variability of angle of progression was good. This model does not account for anatomic variability.

P16.07

Prognostic parameters for ultrasound-guided external cephalic version: a retrospective review of 92 cases

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Objectives: Prior research suggests that ultrasound-guided external cephalic version (ECV) is a safe and cost-effective way to decrease the frequency of cesarean sections in the case of non-cephalic fetal presentation. The aim of this study was to identify predictor factors which influence the success rate of ECV and hereby provide useful information for patient counseling.

Methods: This retrospective cohort study analyzed 92 cases of ECV between the years of 2002 and 2009. All attempts were preceded by an ultrasound evaluation for fetal presentation, fetal spine position, placental location and AFI, and were performed under direct ultrasound guidance. The success rate and outcomes such as mode of delivery, birthweight, nuchal cord, and Apgar scores were documented. The following variables were analyzed: maternal age, parity, gestational age, body mass index, fetal presentation, placenta location, AFI, fetal gender, birth weight, the use of tocolysis and the use of analgesia. Chi-square and Mann-Whitney U tests were used for statistical analysis.

Results: The rate of ECV success was 60.9% (56/92). The rate of spontaneous vaginal delivery after a successful ECV was 84% (47/56). No serious perinatal complication occurred. Prognostic parameters associated with successful ECV included multiparity, high AFI, female fetus, use of tocolysis and use of regional analgesia. No significant differences were observed when the remaining variables were assessed.

Conclusions: Multiparity, high AFI, female fetus, the use of tocolysis and the use of regional analgesia are predictors of ECV success. By identifying these prognostic parameters we can improve patient counseling prior to an ECV attempt.

P16.08

3D-ultrasound evaluation of changes in the midline angle as an index for fetal head rotation in nulliparous women with and without epidural analgesia

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Objectives: To assess the changes in the midline angle (MLA) as an index for fetal head rotation in nulliparous women with and without epidural analgesia using 3D-ultrasound.

Methods: We prospectively recruited G1 patients with singleton uncomplicated pregnancies at term (37+0-41+0 weeks) at the beginning of the active second stage of labor in our University hospital between November 2010 and January 2011. Patients were divided into two groups: group A included those who underwent elective epidural, while group B included patients who did not have analgesia. MLA was assessed by 3D-ultrasound at the beginning of the second stage of labor and compared between the two groups. Time elapsing from the beginning of the second stage to the delivery was recorded and compared between the two groups.

Results: 36 patients, of which 22 in group A and 14 in group B were included in the study. Neither the MLA nor the duration of the second stage of labor showed a significant difference between group A and group B (43 ± 23.7° vs. 33 ± 20.8°; $P = .21$ and 62.3 ± 48.9 min vs. 54.3 ± 39.6 min; $P = .61$, respectively).

Conclusions: In nulliparous women the degree of fetal head rotation as evaluated by the midline angle and the length of the active second stage of labor seem not to be affected by administration of epidural analgesia.