Objectives: To study the maxilla-nasion-mandibula angle (MNM angle) as an objective measurement for the anteroposterior relationship of the jaws, by prospectively 1) assessing intraobserver reproducibility and 2) establishing normal values and retrospectively 3) evaluating the MNM-angles in abnormal fetuses.
Methods: Volumes of the face, starting midsagittally, were acquired in 168 healthy Caucasian women between 16 and 34 weeks' of pregnancy. With the multiplanar mode the exact midsagittal plane was obtained. The MNM-angle was defined as the angle between the lines: maxilla-nasion and mandibula-nasion. In 50 of the 168 women two volumes were acquired and the MNM-angle was measured once in each volume, by one ultrasonographer. The mean difference and 95% limits of agreement between paired measurements were determined. In 4 fetuses with known abnormalities (Down syndrome, Pfeiffer syndrome, Goldenhar syndrome, micrognathia) MNM-angles were measured retrospectively.
Results: In 12 cases no volume could be analysed. 1) In 95% of the cases, the difference between 50 paired measurements was between −2.38° and 3.29°. 2) The mean MNM-angle of 156 fetuses was 13.5° (95% CI 13.2°–13.8°) and showed a non-significant change from 16 to 34 weeks' gestation. 3) The fetuses with Down syndrome and Pfeiffer syndrome had a significantly smaller (8.2° and 2.8°) and the fetuses with Goldenhar syndrome and micrognathia a significantly larger (22.1° and 22.8°) MNM angle (below the 5th and above the 95th centile respectively).
Conclusions: The MNM angle can easily be measured with 3D-ultrasound and 1) has good intraobserver reproducibility. 2) The MNM-angle is stable between 16 and 36 weeks' gestation with a mean of 13.5°. 3) The MNM-angle can assist in distinguishing between normal and abnormal anteroposterior relationship of the jaws.

OP13.12
Arthrogryposis: 5-year review of cases at a large UK teaching Hospital

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Arthrogryposis is a term used to describe non-progressive multiple joint contractures that generally result from lack of movement in-utero. Its incidence is 1 in 3000 livebirths.
Aim: We set out to review the clinical course and management of cases of arthrogryposis delivering at our hospital over 5 years.
Methodology: Cases were identified from the regional congenital anomalies register, the genetics department and maternity databases. Case notes were reviewed and variables identified for analysis.
Maternal age, parity, ethnicity, gestational age at diagnosis, family history, and mode of delivery were recorded. Genetic notes were reviewed for investigations performed and counseling provided.
Results: From 2002–2007, there were 27 cases of arthrogryposis with a mean maternal age of 28.5 years.
16(59.3%) patients were caucasian, 7(25.9%) asian and 4(14.8%) black. 17(63%) of the patients were nulliparous.
In 8 patients there was a family history of congenital anomalies. 3 patients had previously affected children and in 2 cases the partners were affected with arthrogryposis. 5 patients were from consanguineous families.
18 (66.7%) cases were diagnosed antenatally at a mean gestation of 21 weeks. 6 patients chose to terminate the pregnancy.
12 patients (57%) had caesarean sections while 9 (43%) delivered vaginally at a mean gestational age of 36.8 weeks with a mean birthweight of 2.4kg. There were 4 neonatal deaths and 3 intrauterine fetal deaths.
16 (59%) of patients were reviewed by clinical geneticist after diagnosis. The abnormal results from investigations carried out included 2 patients with abnormal Electromyography and nerve conduction velocity, 3 patients had abnormal MRI findings and in 2 patients there were fat deposits in muscle planes on histology
Conclusions: Appropriate investigation and review of these patients by clinical geneticists is important to optimize the chance of making a specific diagnosis to allow accurate genetic counseling.

OP14: FETAL GROWTH RESTRICTION

OP14.01
Assessing early first trimester growth with ultrasonography: The influence of ethnic background

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Objectives: Birth weight (BW) variation with maternal ethnicity is well documented and correlated with subsequent morbidity and mortality. Low BW can be predicted by smaller than expected CRL at the end of the first trimester. 11–14 week ultrasound is used as a baseline for later growth assessment and intervention. Our objective was to determine whether ethnicity influences growth during the first trimester.
Methods: Prospective cohort study of 1828 women attending for initial transvaginal scan before 12w. Inclusions were: natural singleton pregnancies, certain dates, confirmed viability at 11–14w and no reported fetal abnormality. Multilinear regression analysis was used to determine whether ethnicity influenced rate of change of crown rump length (CRL), mean gestation sac diameter (MSD) and mean yolk sac diameter (MYD).
Results: 465 women were included, providing 1067 cross sectional data points. 67% were white, 16% black, 14% asian and 3% mixed origin. GA by LMP at entry ranged from 29–83d (median 50). Measurements were recorded from 29–100d. Black ethnic origin was associated with increased rate of growth of CRL ($P = 0.0011$): in black patients, there was an extra increase in CRL of 0.0245 mm per day gestation (95% CI 0.00986,0.039), equivalent to 1 mm difference at 6w and 2 mm at 12w. Black ethnic origin was also associated with increased rate of growth of CRL/MSD ratio ($P = 0.035$). Ethnic difference remained after adjustment for maternal age, parity and bleeding.
Conclusions: In this study, rate of growth of CRL was greater in black than non-black women, accounting for a small but significant difference in observed CRL during the first trimester. Redating pregnancies with traditional (Robinson/Hadlock) charts could potentially introduce errors of up to 2d in black women. As 11–14w ultrasound dating is used routinely in preference to LMP, these data suggest customized charts should be considered to avoid subsequent inappropriate growth interpretation and intervention.