Results: The PDVDR, the PLVLR and the PAVAR showed a linear decrease with increasing fetal BPD and were below the 5th percentile in 82.4%, 94.1% and 94.1% of the cases with ventriculomegaly. Ventriculomegaly was isolated in 29.4% and associated with further anomalies in 70.6% at the initial evaluation. However, in 2 cases with first trimester isolated ventriculomegaly, additional central nervous system anomalies were present at a follow up scan. The mean PLVLR in euploid compared to aneuploid fetuses was significantly lower (0.40 versus 0.53 ($p = 0.0332$)).

Conclusions: The measurements of PDVDR, PLVLR and PAVAR are helpful to objectify ventriculomegaly at 11–14 gestational weeks. The PLVLR and PAVAR were superior to PDVDR, since there seems to be rather a shrinkage of the choroid plexus than an increased width of the lateral ventricle in the first trimester.

OC07: ULTRASOUND IN ONCOLOGY

OC07.01

The International Endometrial Tumor Analysis (IETA) study: interim analysis of measurement differences between centres

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Objectives: In multicentre studies, measurements will vary between centres for various reasons (e.g. subjectivity of measurements, differences in equipment, deviations from the protocol and differences in patient populations). The aim of this interim analysis by the International Endometrial Tumor Analysis group is to identify the variables with the strongest intercentre differences.

Methods: 1864 consecutive women presenting with abnormal uterine bleeding underwent ultrasound examination by one of 20 international investigators. Women with an available histological diagnosis ($n = 1504$) were included in the analysis. We studied the variability in measurements of the endometrial thickness (unenhanced ultrasound examination (UUE) and fluid instillation sonography (FIS)), endometrial junction (UUE), presence of fibroids, patient age, BMI, use of anticoagulant therapy and use of hormonal therapy. The statistic used was the residual intraclass correlation (RICC) after adjustment for the type of lesion. An RICC of 0% indicates that the variability in the measurements is not due to differences between investigators.

Results: Normal endometria ($n = 593$) were distinguished from endometria with malignant ($n = 100$), focal ($n = 609$), diffuse ($n = 116$) and other ($n = 86$) lesions. The strongest differences between investigators were observed for the assessment of the endomyometrial junction as irregular (RICC = 56.9%), undefined (48.4%), or interrupted (36.9%) vs. regular. The use of anticoagulant therapy also varied across investigators (RICC = 41.7%), with 11 of 20 investigators not reporting anticoagulant therapy for any patient. The reported presence of fibroids, BMI and thickness of the endometrium (UUE) exhibited the smallest differences between investigators (RICC < 6%).

Conclusions: The results suggest that the assessment of the endomyometrial junction is difficult and subjective and that anticoagulant therapy use is underreported. This should be considered when analysing the data.

OC07.02

A trial of preoperative diagnosis of uterine sarcoma using tumor signal intensity at magnetic resonance imaging (MRI)

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Objectives: Uterine sarcoma is a rare and poor prognostic disease and its preoperative diagnosis from uterine tumor is difficult, since there are many cases of myoma uteri. We focused on tumor signal intensity at MRI T2 weighted imaging for the preoperative diagnosis of uterine sarcoma. The purpose of this study is to determine the tumor signal intensity as an accurate preoperative evaluating method for uterine sarcoma.

Methods: MRI was performed in 16 cases of uterine sarcoma in the last 5 years at our hospitals (sarcoma group). In contrast, 22 cases of leiomyoma received MRI in 2013 (myoma group). We selected uterine muscle, urinary bladder, subcutaneous fat and other leiomyoma of uterus as control structure. We calculated tumor to other structures signal intensity ratio (SIR) and compared between two groups. In the structure that has significant difference, the cutoff value to predict sarcoma was calculated.

Results: The sarcoma group had significantly higher tumor to mural layer SIR when compared with the leiomyoma group (1.95 ± 0.634 vs. 0.879 ± 0.592, $p < 0.01$). The same results were confirmed on tumor to urinary bladder SIR (0.720 ± 0.181 vs. 0.399 ± 0.329, $p < 0.01$) and tumor to fat SIR (0.810 ± 0.205 vs. 0.456 ± 0.336, $p < 0.01$). Except for other leiomyoma of uterus, every SIR has significant difference between the two groups. The best cutoff value to diagnose sarcoma is over 1.37 in tumor to uterine muscle SIR (sensitivity: 84%, specificity: 93%, area under the curve (AUC): 0.902), 0.451 in tumor to urinary bladder SIR (sensitivity: 77%, specificity: 93%, AUC 0.851) and 0.512 in tumor to fat SIR (sensitivity: 75%, specificity: 100%, AUC 0.833).

Conclusions: It is suggested that preoperative diagnosis of uterine sarcoma is possible by evaluation of its signal intensity on T2-weighted images at MRI.

OC07.03

Intra- and interobserver reproducibility with regard to describing ultrasound images of the endometrium using IETA terminology

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Objectives: To estimate intra- and interobserver reproducibility with regard to describing ultrasound images of the endometrium using the International Endometrial Tumor Analysis (IETA) terminology.

Methods: Four very experienced and four less experienced observers assessed video clips of transvaginal ultrasound examinations of the endometrium from 112 women. The following features were rated: endometrial echogenicity and pattern (uniform with 4 patterns; non-uniform with 5 patterns), endometrial midline (4 patterns), bright edge (yes, no), endomyometrial junction (4 patterns), color score (1 to 4), vascular pattern (7 patterns), irregularly branching vessels (yes, no), color splashes (yes, no). Each observer assessed each clip twice >2 months apart. The observers were blinded to their own results and to those of the others.

Results: Intraobserver agreement beyond chance was moderate or good for all variables; Cohen's Kappa (K) values (median for 8 observers) ranging from 0.489 to 0.766. Interobserver agreement beyond chance was fair or moderate for the grey scale ultrasound variables (Fleiss K 0.252–0.617). It was best for endometrial echogenicity "uniform vs. non-uniform" (Fleiss K 0.589) and for the appearance of the endometrial midline (Fleiss K 0.617). It was poorest for the appearance of the endometrial-myometrial junction (Fleiss K 0.252) and the presence of bright edge (Fleiss K 0.298). Differences between the very experienced and less experienced observers were small. Interobserver agreement beyond chance for the color Doppler variables was moderate (median Fleiss K 0.454; IQR 0.451–0.456) but was better for the very experienced observers (median Fleiss K 0.503; IQR 0.500–0.506) than for the less experienced ones (median Fleiss K 0.379; IQR 0.377–0.383).

Conclusions: Intraobserver agreement with regard to grey scale and color Doppler ultrasound features when using IETA terminology was moderate to good and interobserver agreement was fair to moderate.

OC07.04

Transvaginal/transrectal ultrasound for assessing myometrial infiltration in endometrial cancer: a comparison of six different approaches

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Objectives: To compare diagnostic performance of six different approaches for assessing myometrial infiltration using transvaginal/transrectal ultrasound in G1/G2 endometrioid type endometrial carcinoma.

Methods: Myometrial infiltration was assessed by two-dimensional transvaginal/transrectal ultrasound 169 women with G1/G2 endometrioid type endometrial carcinoma. In 74 women 3D ultrasound was also performed. Six different techniques for myometrial infiltration assessment were evaluated (subjective impression, Karlsson's technique, endometrial thickness, tumor/uterine 3D volume ratio, tumor distance to myometrial serosa (TDS) and van Holsbeke "subjective model"). All women included underwent surgical staging within one week after ultrasound evaluation. Definitive histopathological data regarding myometrial infiltration was used as gold standard. Sensitivity and specificity were calculated and compared.

Results: Subjective impression and "subjective model" performed similarly (Sensitivity 79.5% and 80.5%, respectively. Specificity: 89.6% and 90.3%, respectively). Both methods had significantly better sensitivity than Karlsson criteria (sensitivity: 31.8%, $p < 0.05$) and endometrial thickness (sensitivity: 47.7%, $p < 0.05$) and better specificity than Tumor/Uterine volume ratio (specificity: 28.3%, $p < 0.05$) and TDS (specificity: 41.5%, $p < 0.05$).

Conclusions: Subjective impression seems to be the best approach for assessing myometrial infiltration in G1/G2 endometrioid type endometrial cancer. Mathematical models and other objective 2D and 3D measurement techniques do not improve diagnostic performance.

OC07.05

Application of 3D ultrasound in the assessment of dose-dense NACT efficacy in patients with cervical cancer

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Objectives: Dose-dense Carboplatin – Paclitaxel is a promising chemotherapic regimen for cervical cancer patients in neoadjuvant setting (NACT), taking advantage of antiangiogenic power of Paclitaxel when used following this schedule. Objective of this pilot study was to test ultrasound (US) in the evaluation of chemotherapy response in terms of tumor volume reduction and vascular changes.

Methods: All consecutive patients with histological diagnosis of cervical cancer FIGO stage IB2 to IIB scheduled for NACT (dose-dense Carboplatin – Paclitaxel) followed by radical surgery underwent transvaginal or transrectal US at day 1 of every cycle of chemotherapy, performed by the same experienced ultrasound examiner. 3D tumor volumes and 3D vascular indices were evaluated: vascularisation index (VI), flow index (FI) and vascularisation-flow index (VFI).

Results: Tumor volumes measured at day-1 of every cycle decreased from 46.81 (±64.9) at cycle 1 to 18.8 (±19.7) at cycle 2 and 6.6 (±9.9) at cycle 3 ($p < 0.001$, Chi-square for trend). A trend toward reduced tumor volume was observed comparing Cycle 1 and 2 ($p = 0.06$) and Cycle 2 and 3 ($p = 0.06$). Similarly, vascular indices modified during NACT. VI decreased over NACT time from 45.75 (±22.74) at cycle 1 to 18.81 (±19.74) at cycle 2 and 6.66 (±9.9) at cycle 3 ($p < 0.001$, Chi-square for trend). FI was not influenced by NACT administration ($p = 0.53$). VFI decreased from 21.06 (±12.76) at cycle 1 to 17.38 (±10.52) at cycle 2 and 16.64 (±16.73) at cycle 3 ($p = 0.01$, Chi-square for trend). Between Cycle 1 and 2, VFI decreased significantly ($p < 0.001$); while no differences were observed between Cycle 2 and 3 ($p = 0.18$).

Conclusions: Our data suggest that US is a useful imaging technique for assessing NACT efficacy. A larger series of patients is needed to better understand effects on vascularisation and its potential clinical implication in patients undergoing dose-dense chemotherapy regimen for cervical cancer.

OC07.06

Ultrasound accuracy in prediction of pelvic carcinomatosis and rectosigmoid involvement in advanced ovarian cancer patients

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Objectives: Residual tumor after primary surgery is one of the most important prognostic factors in the management of advanced ovarian cancer patients. Optimal debulking requires extensive surgery in more than 30% of patients. Prediction of pelvic carcinomatosis or rectosigmoid involvement allows for planning of adequate operation time and experienced surgical team. It was the aim of the study to evaluate ability of transvaginal ultrasound to predict spread of tumor on parietal and visceral pelvic peritoneum.

Methods: Enrolled were patients scheduled for cytoreductive surgery in patients with advanced pelvic tumors between years 2010 and 2012. Pelvic carcinomatosis and rectosimoid involvement was evaluated by transvaginal ultrasound and results compared to intraoperative findings and final histology reports from resected peritoneum. Only patients with confirmed epithelial ovarian cancer remained for the final analysis.