Methods: One hundred seventeen patients with invasive cervical carcinoma were enrolled for the assessment of vascular grading and tumor flow using transvaginal ultrasound with power Doppler angiography (TV-PDA) before treatment. The modified visual grading system of the vascular ratio (grade I to grade III) and six blood flow characteristics of tumor vessels (including PI, RI, PS, ED, TAMX, and VI) were measured by TV-PDA. In addition, the serum levels of SCC antigens were randomly obtained in 74 patients with invasive cervical squamous cell carcinoma (stage Ia to IIIb) before treatment.

Results: The modified visual grading system of the vascular ratio significantly correlated with the pretreatment SCC serum levels (p<0.05), and the intratumoral RI values (p<0.05, r²=0.49) from multiple regression analysis in 71 patients with invasive squamous cell carcinoma of cervix. It negatively correlated with intratumoral RI values (Pearson correlation coefficient [r]= -0.571, p=0.001), but positively correlated with pretreatment SCC serum level (Pearson correlation coefficient [r]=0.296, p=0.012).

Conclusions: The modified visual grading system of the vascular ratio was a valuable sonographic marker in assessing invasive cervical carcinoma. This semi-quantitative analysis with the pretreatment SCC serum levels are two effective assessing markers in invasive cervical carcinoma.

32206
Evaluation of contrast-enhanced ultrasound for differential diagnosis of liver tumors
Hirai T, 1 Ohishi H, 1 Takahashi M, 1 Tokuno E, 1 Anai H, 2 Sakaguchi H, 2 Kichikawa K, 1 1. Oncoradiology, Nara Medical University, Kashihara, Nara, Japan, and 2. Radiology, Nara Medical University, Kashihara, Nara, Japan

Objective: The usefulness of three phases of contrast-enhanced US (CEUS) for differential diagnosis of liver tumors was investigated.

Methods: Sixty-five lesions were examined by CEUS. There were 42 cases of HCC, 12 odafonatomatous hyperplasia (AH), 4 of metastastic liver tumor (Meta), 4 of liver hemangiona, and 3 of FNH. The apparatuses used were GE LOGIQ 700 and LOGIQ 7, and lesions were observed using Coded Harmonic Angio (CHA) or TruAgent Detection (TAD). One vial of 300 mg/ml of Levovist was intravenously injected, and real-time tumor blood flow was observed during the early phase for about 40 seconds after injection, then tumor stain was imaged by 1-second intermittent transmis-sion. Observation was temporarily suspended, and sweep scan of the liver including lesions was performed in the late phase until 1–3 minutes and in the delayed phase 5 minutes after injection.

Results: In all HCC lesions, tumor blood flow and tumor staining were observed during the early phase. Staining disappeared or was weaker than the surrounding liver parenchyma in 34 lesions in the late phase and 41 in the delayed phase. In AH lesions, staining intensity was weaker than that in the surrounding liver tissue in nine lesions, but three lesions showed staining similar to the liver tissues in the early phase. In the late and delayed phases, staining of all lesions was similar to that of the surrounding liver tissue. In Meta, ring-like staining was observed in 3 lesions, and 1 lesion was completely stained in the early phase. In the late and delayed phases, weaker staining than the surrounding parenchyma or no staining was observed in all lesions. In liver hemangiona lesions, the fill-in pattern, in which staining expanded from around the lesion toward the center, was observed in 3 lesions in the early to late phase. One lesion was stained ring-shape in the early phase, but no staining was observed in the late or delayed phase. Among FNH lesions, inflow radial vessels and whole staining were observed in all 3 lesions in the early phase. In the late phase, staining similar to the surrounding liver was observed in two lesions, but intense staining was observed in one lesion.

Conclusions: CEUS is useful for differential diagnosis of liver tumors.

32208
Predicting fetal birth weight by ultrasound with the use of genetic programming
Chuang L, 4 Huang J, 2 Chien B, 3 Lin J, 4 Chung C, 1 Yu C, 1 Chang F, 1 1. Obstetrics and Gynecology, National Cheng Kung University Hospital, Tainan, Taiwan, 2. Technology Research, ASN Technology Corp. (Taiwan), Tainan, Taiwan, 3. Information Engineering, I, Shou University, Kaohsiung, Taiwan, and 4. Computer & Information Science, National Chiao Tung University, Hsinchu, Taiwan

Objective: The aim of this study was to propose an efficient method, based on ultrasound data and a genetic programming technique, for the accurate prediction of fetal birth weight. This method also has the capability to adjust estimation equation parameters with the growth of fetuses’ ultrasound examination data automatically, to obtain higher accuracy in prediction of fetal birth weight.

Methods: From January 2000 to June 2001, we performed ultrasound examinations on every singleton fetus admitted to the delivery room in the daytime, at the National Cheng Kung University Hospital. The exclusion criteria were anomalous fetuses, multiple gestations, and fetuses not delivered within 3 days of ultrasound examination. A total of 927 fetuses were used as the training group to construct the fetal birth weight estimation equations by using genetic programming techniques (GP). To further validate these fetal weight prediction equations generated by GP, 319 fetuses that were delivered within the subsequent 6 months (from July 2001 to December 2001) and met the criteria described above were used as validation group. Six variables in ultrasound data were used to construct estimation equations with GP techniques: biparietal diameter (BPD), occipitofrontal diameter (OFD), abdominal circumference (AC), femur length (FL), gestational age (GA), and fetal presentation (FP).

Results: In this study, absolute percent error (APE) 5% is used as the fitness function in GP program. The fitness function is a function that used to evaluate generated estimation equations to achieve the criteria. One equation generated by using the training group ultrasound data with GP achieved the criteria. The generated equation was polynomials with degree = 1 as listed below. This equation was applied with validation group data, and the result showed APE=6.22% and SD=5.10%. 

\[
((36/(AC*35.10%)) + 52*(GA)/(AC)) + 52*(GA)/(AC) + 52*(GA)/(AC) + 52*(GA)/(AC) + (AC*(−15)) − FP).
\]

Conclusions: This study demonstrated the capability of GP technique in predicting fetal birth weight. Further study is needed to compare the results with traditional formulas generated from regression analysis.

32209
Extended field-of-view sonography: Advantages in abdominal application
Choi B, 1 Lee K, 1 Kim K, 1 Han J, 1 Kim S, 4 1 Department of Radiology, Seoul National University Hospital, Seoul, South Korea

Objective: The aim of this study was to demonstrate the advantages of extended field-of-view (EFOV) sonography in abdominal applications.

Methods: Thirty-one cases were prospectively analyzed in our study. EFOV images were obtained when the radiologist decided that they would offer potential advantages for the examination. When EFOV scanning was used, the radiologist determined prospectively whether it was useful according to the several categories. Images were obtained using a 2- to 5-MHz curved array transducer or 4- to 5- to 9 or 12-MHz linear array transducers.

Results: EFOV sonography provided several potential benefits over conventional sonography in the abdominal area. The advantages of EFOV sonography were better demonstration of the spatial relationship