

severity were revealed in 60.4% cases (32 patients). The latter were caused by redistribution of pulmonary blood flow due to functional failure of LV caused by different reasons. Remaining 14 patients (26.4%) showed signs of central pulmonary arterial hypertension which appearance was due to CHV with the narrowing of the valve orifice rings (usually of the mitral valve) and EH. These radiographic studies correlate with the clinical assessment of heart failure (mainly III-IV functional class according to the classification of the New York Heart Association (NYHA)).

Conclusions. Thus, patients with CHD and CHV have more pronounced left ventricular dilatation with reduced systolic function, as evidenced by the higher class of heart failure (III-IV degree by NYHA.). The findings suggest that the combination of CHD and CHV can lead to more significant negative changes in hemodynamics in PC.

UTILITY OF INTRAVAGINAL ULTRASOUND GEL FOR MRI EVALUATION OF CERVICAL CANCER

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Introduction. Cervical cancer remains among the leading causes of cancer-related death in women. In the Republic of Moldova it represents the second most frequent cancer in women after breast cancer. Accurate staging provides important information about the disease extent and anticipated response to treatment. For instance, the presence of parametrial invasion makes radiation therapy rather than surgery the preferred treatment. MRI is ideal for the delineation of cervical tumors and is now an integral part of local staging. The modality is especially useful in the diagnosis of parametrial invasion and plays an important role in the selection of therapeutic regimens, including surgical interventions or radiation therapy. Although direct lateral extension into the parametrium is rather easily recognized, the visualization of lesions that spread eccentrically into the lower portion of the cervix may prove really challenging.

Aim. The purpose of the study was to assess whether application of aqueous intravaginal ultrasound gel can improve visualization and disease staging in patients with carcinoma of the uterine cervix undergoing a pelvic MRI exam.

Material and methods. The study included 92 patients aged 21-72 years with cervical cancer investigated in the period February 2013 – December 2016. All patients underwent a formal pelvic MRI exam with and without intravaginal gel for evaluation of their disease extent. MRI findings were analyzed according to the MR criteria for staging of cervical cancer and were correlated with the biopsy results, as well as with the intraoperative findings when applicable. Sensitivity and specificity were calculated for different parameters.

Results and discussion. In our study, intravaginal ultrasonographic gel significantly improved the visualization and delineation of cervical lesions on pelvic MRI. Thus, in patients using intravaginal gel stage IIA disease was accurately diagnosed in 11 patients (versus 2 patients without gel application), stage IIB disease — in 18 patients (versus 16 patients without gel application),

stage III disease — in 11 patients (versus 5 patients without gel application) and stage IVA disease — in 6 patients (versus 4 patients without gel application). The detection rate appeared similar with and without intravaginal gel application in patients with stage I (21 patients) and stage IVB (19 patients) disease. Overall, the application of intravaginal ultrasonographic gel increased the accuracy of pelvic MRI for cervical carcinoma staging from 72.8% to 93.5%, demonstrating a particularly high sensitivity for detecting vaginal invasion (100% in our study.) It also increased the inter-observer agreement from 71% to 90%.

The gel was well tolerated by all patients. Due to its aqueous content, the ultrasonographic gel appeared as a highly hyperintense material on T2-weighted sequences, substantially increasing the contrast between the tumor (commonly appearing slightly hyperintense on T2-weighted sequences) and the vaginal wall (appearing hypointense on T2-weighted sequences). In addition, gel application appeared to provide a better distention of the vagina with an improved visualization of its upper portion and fornices.

Conclusion. Pelvic MRI with administration of intravaginal gel is well tolerated and provides valuable information related to disease extent in patients with cervical cancer, having a particularly high sensitivity for detecting vaginal invasion. Intravaginal gel application significantly improved disease staging in patients with stages IB, II, III and IVA, demonstrating an overall accuracy of over 90%. Apart from increasing the contrast between the tumor and vaginal wall, gel application provides a better distention of the vagina with an improved visualization of its upper portion and fornices.

OPTIMIZATION OF CLINICAL BREAST MR IMAGING ON 1.5-T SYSTEM: ADJUSTING SCANNING SEQUENCES TO SUSPECTED PATHOLOGY FOR SHORTENING IMAGING TIME

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Introduction. Breast MRI is a powerful tool for breast imaging. Various imaging protocols are available and additional information can be obtained while increasing the imaging time.

Aim. The study aimed to emphasize the role of optimizing breast magnetic resonance imaging (MRI) protocols to individual patients depending on suspected pathology.

Material and methods. In this study we performed 170 contrast enhanced breast MR investigations in an attempt to minimize the imaging time by adjusting scanning sequences to suspected breast pathology.

Results and discussion. A T2-weighted sequence without fat saturation was applied first to identify any cysts or microcysts, since a T2 signal greater than that of non-saturated fat has a good predictive value for a cyst being benign. A T2-weighted sequence with fat saturation, on the other hand, was applied in patients with nipple discharge and suspected malignancy for obtaining indirect MRI ductography images and optimizing the detection of small cancers. This was followed by a T1-weighted sequence for detecting the presence of a fatty component or biopsy markers within a lesion and by

diffusion weighted imaging (DWI). Three-dimensional imaging with a T1-weighted spoiled gradient-echo sequence was performed for contrast enhanced sequences. Special protocols have been developed for patients with different breast pathology and breast implants, allowing for a shorter imaging time.

Conclusion: Breast MRI is a useful modality for detailed evaluation of breast lesions. An awareness of proper imaging techniques can be useful for adjusting technical factors and applied sequences to the clinical setting as well as for shortening the imaging time.

EVALUATION OF SPINAL INSTABILITY USING EOS X-RAY IMAGING SYSTEM: ONE OF THE LATEST TECHNOLOGY ADVANCEMENTS

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Introduction. Spinal instability is commonly used to describe greater than normal range of motion (or “hypermobility”) between two vertebral segments that results in pain or compromised neurologic function. The condition is often linked to degenerative changes in the spine; however, the diagnosis frequently poses a variety of challenges as the pain can be caused by a variety of other factors. Furthermore, establishing a distinct cause relationship between spine mobility and pain in many patients may prove nearly impossible. EOS X-ray imaging system is a low-dose, 3D imaging system manufactured by EOS imaging (formerly known as Biospace Med, Paris, France). The imaging system relies on the high sensitivity of a special detector (a multi-wire chamber invented by Georges Charpak, for which he was awarded the 1992 Nobel Prize) to produce high-quality images with less irradiation than standard imaging techniques. While EOS imaging may have many potential applications, it has been reported as being most useful in relation to those conditions that require imaging that is weight-bearing, full body, simultaneous postero-anterior and lateral, three-dimensional (3D), and/or where radiation exposure is a concern.

Aim. In this study we aimed to evaluate the spinal instability in a cohort of patients who underwent both whole spine static imaging and functional probes (posterior — anterior and lateral mobility assessment) using an EOS X-ray imaging system.

Material and methods. The study included 114 patients (82 females and 32 males) aged 18-60 years old with suspected spinal instability. All patients underwent whole spine static imaging as well as functional probes consisting of flexion–extension and side-bending X-rays for posterior — anterior and lateral mobility assessment using an EOS X-ray imaging system. The data were correlated with clinical symptoms and available clinical records.

Results and discussion. The static images revealed morphological changes consistent with lumbar spine instability in 93 from 114 (81.6%) patients. From these, 55 (59.1%) patients and changes consistent with cervical spine instability in 21 from 114 (18.4%) patients. A total of 55 from 93 (59.1%) patients with detected lumbar spine instability on static images demonstrated additional abnormalities on functional probes involving posterior — anterior and lateral mobility assessment.

Abnormal functional probes showed also a good correlation with reported clinical symptoms, suggesting that EOS imaging represents a suitable modality for evaluating patients with suspected spinal instability. Other common indications may include kyphosis, scoliosis, deforming dorsopathies and congenital deformities of the spine, hips or lower extremities. Reducing radiation dose may be particularly beneficial for children who need to be imaged frequently, such as children with spinal deformities. Thus, EOS delivers a radiation dose that is 6 to 9 times less than a standard X-ray film and 20 times less than a basic computed tomography scan. The technique allows capturing simultaneous frontal and lateral head-to-toe images of patients in the upright, weight-bearing position with an outstanding image quality. True to size images (1:1 scale) for surgical planning and monitoring of bone and joint diseases can be also obtained. Although EOS imaging is considered by many users to be the future gold standard of X-ray imaging of the skeleton due to its many advantages (mainly 3D reconstruction with a low radiation dose), it should be remembered that the modality is not currently used for assessing injuries or conditions that can be evaluated with general radiography, such as bone fractures, evaluation of lung nodules or examinations involving fluoroscopy, angiography, and mammography. Traditional X-rays are still the standard of care in such situations.

Conclusion. The study demonstrated that EOS X-ray imaging represents a suitable modality for evaluating patients with suspected spinal instability. Functional probes involving posterior — anterior and lateral mobility assessment obtained by this system provide additional information and show a good correlation with clinical symptoms. In the Republic of Moldova this is the first EOS X-ray imaging system — its impact on the quality of radiology and medical imaging services is still under evaluation and this may become more evident in the coming years.

IMAGING OF BREAST IMPLANTS: ABNORMAL FINDINGS REVEALED BY BREAST ULTRASOUND AND CONTRAST ENHANCED BREAST MRI

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Introduction. With the evolution of implant devices and surgical options, the radiologists are facing new challenges related to the diagnosis of implant-related complications.

Aim. The study aimed to assess the role of breast ultrasound and magnetic resonance imaging (MRI) in the evaluation of patients with breast implants.

Material and methods. The study included 19 consecutive female patients who presented for evaluation of their breast implants and underwent both breast ultrasound and breast MRI examinations. The findings were reported according to the Breast Imaging Reporting and Data System (BI-RADS) classification.

Results and discussion. Contrast enhanced MRI revealed a higher number of breast abnormalities (42.1% exams ranking as BI-RADS II category and 10.5% as BI-RADS III category) compared to breast USG