



Breast imaging in Kosovo

An interview with Dr. Ardian Biçaku, radiologist at the Clinic of Radiology at the University Clinical Centre of Kosovo in Pristina, PhD candidate at the School of Medicine, University of Zagreb, Croatia, and Coordinator of Mobile Mammography in Kosovo.

European Society of Radiology: *Breast imaging is widely known for its role in the detection of breast cancer. Could you please briefly outline the advantages and disadvantages of the various modalities used in this regard?*

Ardian Biçaku: Breast radiology has a fundamental role in the early detection of breast cancer, which is primarily achieved through screening mammography. Mammography is currently the only screening test proven to help reduce mortality from breast cancer in women. It saves lives by enabling doctors to find cancer before it has metastasised; it can be used to detect breast lumps two or three years before a woman or her physician can feel them and it is the most effective tool for detecting calcifications which are often associated with early-stage breast cancers such as ductal carcinoma in situ (DCIS). However, mammography has its limitations, such as decreased sensitivity for detecting breast cancer in highly dense breast tissue or in certain locations. Sometimes, it may lead to additional imaging due to false-positive findings. Another disadvantage of mammography is exposure to ionising radiation. Although this is a very low-dose of radiation, it is still an important issue that should always be considered.

Breast ultrasound is an indispensable adjunct to mammography; it can be used to detect lesions in women with dense breasts when mammography cannot. Ultrasound can show the difference between a cyst and a solid mass where mammography cannot. Unlike mammography, ultrasound does not expose patients to ionising radiation and this attribute allows ultrasound to be used on pregnant women and also younger patients. Ultrasound is widely available, which is the case in my country, thus ultrasound is often used as the first imaging modality in breast imaging. On the other hand, some of the disadvantages of breast ultrasound are the need for an experienced and skilled operator, as well as good equipment; limitations on detecting calcifications; and higher rates of false-positive results (even higher than mammography) that lead to unnecessary biopsies.

Magnetic Resonance Imaging (MRI) is an important tool, mostly used in breast cancer diagnosis and staging rather than in screening. Breast MRI screening is recommended only for certain high-risk women, including women with BRCA1 and BRCA2 gene mutation, or in women with syndromes and other conditions associated with increased risk for breast cancer. Breast MRI does not use ionising radiation and it has several potential benefits in helping to investigate breast concerns. It can help in the evaluation of the extent of breast cancer, thus it will help in determining the type of surgery to be indicated; it is used effectively in dense breasts; it may be used to detect breast cancer recurrences and residual tumours after lumpectomy; it can be used in monitoring treatment response in patients undergoing neoadjuvant chemotherapy; and it has advantages in imaging of augmented breasts. Disadvantages of breast MRI are that MRI findings alone are non-specific and often cannot distinguish cancerous and non-cancerous tumours. MRI has limitations in visualisation of calcifications which are often associated with early-stage breast cancers (DCIS), although MRI technology in this area is improving. MRI has a moderate rate of false-positive results and may lead to unnecessary biopsies too. High-costs, longer times for examinations, requirements for the administration of contrast media, and limited availability of breast MRI equipment, which is also the case with my country too, are other important disadvantages of breast MRI.

ESR: *Early detection of breast cancer is the most important issue for reducing mortality, which is one reason for large-scale screening programmes. What kind of programmes are in place in your country and where do you see the advantages and possible disadvantages?*

AB: Kosovo is a small country with a population of 1.9 million, a country with many different features compared to other European countries with regard to its healthcare system, population age, and attitude of women and the public towards breast cancer. Public awareness of the early detection of breast cancer is very low, but it is increasing compared with the last decade. There is no national screening programme for breast cancer in Kosovo, and the cancer registry is under ongoing construction. Screening in Kosovo is only opportunistic, without any screening model scheme. Mammographic services are offered through twelve mammographic units in different municipalities; however they have equipment of varying quality, different examination capacities, and different levels of staff education. In many cases, due to its wide availability, ultrasound is used as the first imaging modality for breast examinations.

The only acceptable controlled ongoing screening pilot project is the Ma-Mo project, which has been functioning since 2015 and is organised through a mobile mammography unit. This project's main goals, other than the early detection of breast cancer and offering quality mammographic examinations in remote regions and regions not covered with mammographic service, are to encourage women to undergo mammographic examination, to promote public awareness of breast cancer and to gather data on the present situation regarding the breast care of women in Kosovo. Aside from the advantages and disadvantages of this project I would rather focus on what is happening and what should be done. We are working on increasing the capacities for diagnostic mammography and other breast imaging modalities at the University Clinical Centre of Kosovo, as the only academic institution in our country, and establishing a Breast Imaging Centre that will meet Mammography Quality Standards Act (MSQA) requirements, and eventually we will start accreditation of screening centres at existing mammography units in different parts of Kosovo. We all know that this will also require staff training that we hope we will achieve with international collaboration. However, for all this to happen, we need the continuous commitment of health policy-makers, and financial support – which is the hardest part to accomplish.

ESR: *Do you know how many women take part (percentage) in screening in Kosovo? Do patients have to pay for this?*

AB: Since 2015, when the Ma-Mo project started, around 4,000 women or around 2% of all women in Kosovo aged above 40 have undergone a mammographic examination. Data collected from the Ma-Mo project shows that more than 80% of women in Kosovo have never undergone mammography in their lives. Eighteen percent had one prior mammogram, while fewer than 2% had two prior mammograms. There were no women that had undergone more than three mammograms during their lives. Only few women (less than ten women) had consequent regular mammograms every one-to-two years. Kosovo has not established a public health insurance system yet. Participants in the Ma-Mo project do not have to pay for mammographic examinations, whereas for mammographic examinations in other public institutions there is a fee of 5 to 10 Euros per mammographic examination (not counting private healthcare institutions where women have to pay from 20 to 40 Euros per mammographic examination).

ESR: *The most common method for breast examination is mammography. When detecting a possible malignancy, which steps are taken next? Are other modalities used for confirmation?*

AB: When possible malignancies are detected with screening mammography, patients are recalled for additional imaging designed to clarify imaging uncertainties. Further imaging investigations include diagnostic mammography, which consist of the application of special mammographic projections such as spot compression views, magnification views and other projections as needed, or breast ultrasound for further characterisation of mammographic findings or breast MRI for evaluation of the extent of the lesion and possible multicentricity or multifocality of the lesion. The role of imaging at this stage of diagnosing breast cancer is fundamental and determines the next steps of breast cancer management; this includes determining the appropriate tissue biopsy method,

further requirements for diagnostic evaluations and planning of therapeutic approaches. Diagnosis of breast cancer is completed by histopathologic evaluation of tissue through tissue biopsy of the suspected lesion, either by FNAC (fine needle aspiration cytology), CNB (core-needle biopsy) or wire localisation of the suspected lesion for excisional biopsy, where once again, the role of the image-guided techniques is irreplaceable.

ESR: *Diagnosing disease might be the best-known use of imaging, but how can imaging be employed in other stages of breast disease management?*

AB: Management of breast diseases in general and breast cancer in particular requires a multidisciplinary approach where radiology plays a key role in the management team. Once the described lesion is confirmed as breast cancer, the management team then turns attention to staging the diseases. The size of the lesion, which is pre-operatively estimated originally by imaging modalities, together with lymph node status, have been proven to be a reliable morphologic prognostic factor for breast cancer, and are crucial for treatment planning. These morphologic features, together with the histological grade and assessment by the pathologist form the current basis for staging. As part of TNM (Tumour/Nodes/Metastasis) staging, imaging has an indispensable role in the evaluation of breast cancer patients for distant metastasis. Certainly, all guidelines instruct that suspicious clinical and laboratory tests for distant metastasis are indications to proceed with radiologic imaging like bone scintigraphy, or cross-sectional imaging such as computed tomography (CT) or MRI, or in ambiguous findings positron emission tomography (PET)/CT or PET/MRI. In general, the choice of imaging modality is dependent upon the location of suspected metastases (e.g. MRI is best for evaluating brain metastases, CT is best for evaluating lung metastases, and bone scintigraphy is best for evaluating skeletal metastases). Another important role of imaging is in post-treatment evaluation of breast cancer patients, including evaluation of treatment response, possible recurrence of disease and progression-free survival. In this manner, imaging could help to individualise treatment and to avoid ineffective chemotherapies, with their associated toxicities.

ESR: *What should patients keep in mind before undergoing an imaging exam? Do patients undergoing radiological exams generally experience any discomfort?*

AB: Today, as health promotion is being widely introduced, and sources for patient information on medical issues become easier through electronic media, many question marks regarding imaging exams have been reduced. However, there is always important information that patients should know before undergoing an imaging exam. Patient preparation for imaging examinations, benefits, limitations and possible risks from certain examinations that patients undergo should be explained simply and completely to the patient before beginning the examination. Regarding the scope of breast imaging, during a mammographic examination, patients can feel pressure on their breast as it is squeezed by the compression paddle. In almost all the cases this is a tolerable discomfort for the patient. Patient awareness that this is required to reduce the radiation dose and maximize image quality of mammograms will increase the confidence of the patient and thus help to reduce the possible discomfort that a patient could experience.

Breast ultrasound scanning procedures usually cause no discomfort to the patient. However, if ultrasound scanning is performed over an area of tenderness, the patient may feel pressure or minor pain from the ultrasound transducer.

Breast MRI and MRI exams in general are painless. However, some patients can experience discomfort while remaining still or when asked to hold their breath. Some patients during MR imaging experience a sense of being closed-in (claustrophobia), and others can feel disturbed by tapping or thumping sounds generated when MRI scanning is activated. Intravenous contrast material administration in certain imaging procedures (including CT scanning, which is in general a painless radiologic exam) is another discomfort that patients undergoing a radiological exam can experience. Discomfort related to contrast material administration can include placement of intravenous needles and sensations when the contrast material is injected. To summarise, these are all minor and manageable discomforts that patients experience during imaging exams, and with good information and communication with patients can be reduced and be more acceptable for them.

ESR: *How do radiologists' interpretations help in reaching a diagnosis? What kind of safeguards help to avoid mistakes in image interpretation and ensure consistency?*

AB: Radiologic interpretation is a complex process which consists of detecting abnormalities in acquired images, describing them and understanding the meaning of various findings that can finally be associated with a diagnosis. Interpretation of mammographic, breast ultrasound and breast MRI findings consists of discriminating between benign and malignant imaging features of the detected abnormalities. This is achieved by using descriptors for specific imaging features (descriptors that previously have been shown in the literature to be predictive of benign and malignant disease). One of the most widely accepted tools in standardising breast imaging reporting, which helps to reduce confusion in breast imaging interpretations, is the Breast Imaging Reporting and Data System (BI-RADS), which is also used in our institution. Speaking in general, safeguards that can help to avoid mistakes in image interpretation and ensure consistency, consist of: the availability of well-trained radiologists and radiographers; the availability of a physicist within the radiology department; the implementation of a quality assurance programme and audit; the adoption of standard imaging protocols; equipment quality and equipment maintenance; double reading of radiological exams (highly recommended in breast screening programmes); and staff participation in multidisciplinary conferences (particularly in the field of cancer care). These safeguards in radiology departments in our country are still underdeveloped and some even do not exist at all.

ESR: *When detecting a malignancy, how is the patient usually informed and by whom?*

AB: This is the hardest part of our job. It is a stressful task and can become very frequent during our professional careers. Patients or family members are informed by their physician. In breast imaging, especially in women who undergo regular screening mammography, when delivering the information about a detected malignancy it should be explained that we have detected a malignancy much earlier than if the screening had not been done, and that in these circumstances the chances of complete remission are much more promising. There are protocols for delivering bad news to the patient such as the SPIKES protocol, the ABCDE model, and the BREAKS protocol, however, in every situation delivering news of detected malignancy should be individualised and adapted to the patient, while not affecting the patient's rights to information on their condition and disease.

ESR: *Some imaging technology, such as x-ray and CT, uses ionising radiation. How do the risks associated with radiation exposure compare with the benefits? How can patient safety be ensured when using these modalities?*

AB: Advanced imaging diagnostic and therapeutic procedures have changed patient care, enabling correct and timely decisions and ultimately saving lives. However, overexposure to ionising radiation is linked to the risk of cancer development. Radiology departments are the institutions that are best able to deal with issues of radiation patient safety. Well-organised radiology departments should have radiation dose-management programmes. Such programmes in radiology departments in Kosovo are underdeveloped. Requirements to ensure radiation patient safety in the application of x-ray or CT, include at least: proper functioning of the equipment; comprehensive training of radiology technicians; adoption of ALARA (As Low as Reasonably Achievable) guidelines for dose optimisation; ensuring there is a clinical indication for the requested exam; avoidance of duplicated imaging exams; and ensuring that other imaging modalities, such as ultrasound or MRI, are not viable options.

ESR: *How aware are patients of the risks of radiation exposure? How do you address the issue with them?*

AB: Overall patient awareness regarding the risk of radiation exposure in Kosovo is very low. However, this issue becomes more worrisome when we add to this the physicians' and clinicians' limited knowledge about the risks of overexposure to ionising radiation, and a lack of information on different technological advancements in medical imaging that can be used instead of imaging modalities that use ionising radiation. In our institution, it is up to radiologists to choose the

appropriate imaging modality or modify the imaging procedure to achieving the proper imaging result regarding certain clinical conditions and reduce the risk from radiation exposure. This can involve a considerable amount of misunderstanding between the radiologist, the referring physician and the patient.

So, I strongly believe that an important issue on radiation patient safety is the education of physicians and clinicians regarding the potential risk of ionising radiation when diagnostic modalities are requested.

As for addressing the radiation exposure issues with the patient, the easiest way to explain is to compare the effective radiation dose with natural background radiation exposure for certain radiological exams (e.g. radiation exposure from mammography is equivalent to the amount of radiation exposure a patient experiences from natural background radiation in seven weeks).

ESR: *How much interaction do you usually have with your patients? Could this be improved and, if yes, how?*

AB: Figuratively, there is almost always a 'computer screen curtain' between the radiologist and his patient, where in the front of this 'curtain' many discussions are had by radiologists and referring physicians regarding the imaging findings detected, and behind it, regarding the same findings (written in the radiologic report) discussions are had by patients and their physicians. Today, our radiology department is a very busy institution, and only in some imaging modalities (such as ultrasound) radiologists have sufficient opportunity during the exam to discuss patient complaints and imaging findings apart from the clinical diagnosis. In the mammography department we offer an opportunity for patients to meet with the radiologist and discuss mammography reports, whereas when important findings are detected we tend to connect with the patient and inform them of the further steps to be taken. There is always place for improvement in the interaction between radiologists and patients, although the nature of radiology, for the moment, has its limitations, as the main points of contact for patient management are clinicians. Radiology is a problem solver for the clinician; however, in the chain of patient management radiologists are still 'behind the screen curtain'.

ESR: *How do you think breast imaging will evolve over the next decade and how will this change patient care? How involved are radiologists in these developments and what other physicians are involved in the process?*

AB: Technological advancement would be the main generator for the future of breast imaging, and the research in this field would be oriented in solving the limitations and disadvantages of existing breast imaging modalities. Radiologists have a major role in this field because of their experience in breast imaging and the best knowledge of the limitations and disadvantages of each breast imaging modality. New technological advances are already emerging in this field, such as tomosynthesis (e.g. resolving dense breast issues), elastography in breast ultrasound, automated breast ultrasound, new MRI protocols for detection of microcalcifications, new radiotracers in PET/CT and PET/MRI, new image-guided interventional procedures in breast conserving treatment, new technologies in intraoperative local irradiation etc. Another field of technological advancement will involve the patient and data workflow administration where medical IT services will have an important role. Data workflow administration and analysis of data from other physicians involved in breast cancer management will provide new knowledge and will contribute to new developments in breast cancer patient care. For example, issues of local recurrence of breast cancer will change the pre-, intra- and post-operative procedures for certain breast cancer and new surgical breast preserving techniques will evolve; inclusion and better understanding of different biomarkers by pathologists will develop further classification and staging of breast cancer, which will eventually influence the individualisation of treatment protocols for breast cancer patients by oncologists. The existence of meaningful and standardised services regarding breast cancer will enable correct decisions and ultimately change patient care on a global level. I highly support the quote that "knowing the problem is half of the solution".



Ardian Biçaku, MD is a radiologist at the University Clinical Center of Kosovo (UCCK) in Pristina, the only academic medical centre in Kosovo. He is coordinator of the mobile mammography project *Ma-Mo*, which is planned to be the precursor to implementation of a population-based national screening programme. He has been secretary of the Radiologists Association of Kosovo (RAK) since 2009, and in 2016 was appointed as the Kosovan national delegate to the European Society of Radiology's Quality, Safety and Standards Committee. He has also been involved in the establishment of a non-

vascular interventional radiology department at UCCK. In 2016, he finished his PhD Studies at the University of Zagreb and he is now working on a PhD thesis concerning breast cancer in Kosovo. He has actively participated in national and international regional conferences where he has presented several authored and co-authored papers.