AI and breast screening

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Over the last 10 years, the number of publications on artificial intelligence (AI) in radiology have exponentially increased up to 700–800 per year and breast screening is one of the major applications.

First, breast cancer screening is a public health issue based on a clinical and radiographic examination mammography with a main limitation due to wide variability of interpretative performance, justifying the needed of double-reading of each mammogram. Furthermore, in mammography, we have a long history with Computer Aided Diagnosis (CAD) which was quickly implemented in the USA twenty years ago and nowadays rather neglected due to a high level of false positives. Thus, a certain degree of skepticism exists in breast radiologist's mind about CAD.

The objectives of the presentation are to understand the different existing implementations of artificial intelligence model in the field of breast imaging, their applications and their limitations.

The comparison between AI and Human readings shows different results on mammography, depending on the experience of human readers and the prevalence of the disease in the population. However, most of current studies demonstrate that a radiologist using AI is performs better than a radiologist alone. Finally, several studies suggest that AI model may help to reduce the workflow of screening mammograms, as AI seems able to formally exclude any cancer without increasing recall rate in about 20% of the women.
 Also, AI will probably impact our practice in mammography by decreasing radiation dose and helping the technologist to obtain optimal positioning and improving image quality.
Finally, AI also developed in the field on ultrasonography mainly for helping in the characterization of lesions and on MR imaging for improving cancer detection and for predicting the risk of cancer by the analysis of the parenchyma.

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