A summary of *A Comparative Analysis Between Tomosynthesis and Conventional X-ray Modalities in Mammography*

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Introduction

According to the World Health Organization, breast cancer is the most prevalent cancer in the world, discovered in 2.3 million women and costing the lives of 685 000 people in 2020. An important first step in the fight against breast cancer, is the discovery of an alteration in the breast. It can be said that a faster diagnosis implicates a better prognosis, and therefor there is always room for improvements of x-ray technology. *A Comparative Analysis Between Tomosynthesis and Conventional X-ray Modalities in Mammography* is a metaanalysis with the purpose of answering what the advantages and disadvantages respectively of three different x-ray modalities are. These are Projectional Mammography, Digital Breast Tomosynthesis and Breast Computed Tomography. To answer this qustion, information from various research publications as well as litterature on the subject was collected, and complemented with clinical data from the Mammography Department at Norrlands University Hospital in Umeå. All the collected material was put together and analyzed from different relevant perspectives.

Conclusion

Digital Breast Tomosynthesis, with its similar design to Projectional Mammography, overcomes the problem of overlapping tissue by reconstructing a 3D-image of the breast. This generally leads to better image quality when compared to Projectional Mammography. This is done without a significant increase in the mean glandular dose during an examination. Moreover, the compression can be decreased which might increase the amount of people going to screening, as well as the patient satisfaction rate, due to the increased comfort. Collectively, this makes Breast Tomosynthesis a viable alternative to Projectional Mammography for screening, as well as follow up examinations.

Breast Computed Tomography, based on the CT principles of reconstructing the entire object 3D, also overcomes the problem of overlapping tissue. However, due to limitations in current technology as well as the design of the equipment, there is bad visibility of potentially malign microcalcifications as well as bad axillary lymph node coverage. This issue makes determining the stage and also the very existence of cancer in the breast difficult. Moreover, the price as well as the need for contrast enhancement would have to be investigated to determine the practical applications of a dedicated Breast CT. The design of the Breast CT however may be more ergonomic than that of the equipment of Breast Tomosynthesis or Projectional Mammography. The conclusion is that Breast CT is not currently a viable alternative to projectional mammography or breast tomosynthesis, but has potential to be improved and used clinically in the future.