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MANUFACTURE OF MAMMOGRAPHIC FINDINGS PLATE FOR THE STUDY OF THE INTERFERENCE OF SILICONE IMPLANTS IN THE EARLY DIAGNOSIS OF BREAST CANCER

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1. Introduction: Breast cancer is the most prevalent malignancy among women, with a mortality rate of around 30%. This pathology, if identified and treated early, has a favorable prognosis, with a survival rate of almost 100%. Currently, mammography is the test of choice for breast cancer screening. It is possible to detect early mammographic findings suggestive of malignancy. Within this context, microcalcifications, calcium deposits in breast tissue, are the earliest sign of neoplastic lesions, often being the only indication. In the current scenario, augmentation mammoplasty is the most performed surgical aesthetic intervention in the world. Many studies show that such a procedure can interfere with the search for early findings, such as breast microcalcifications, and thus make the diagnosis of breast cancer difficult. 2. Objectives: The present study aims to create a mammographic findings board using accessible materials, of low monetary value and compatible with breast tissue, in order to study this possible interference. 3. Methods: For the fabrication of the mammographic findings plate, materials that were compatible with the breast tissue and its possible neoplastic findings were searched in the literature. Thus, a number 7 dental wax plate was used, measuring 15 cm in length by 7.5 cm in width. Crushed chicken eggshells, composed of calcium carbonate ($CaCO_3$) and magnesium, with diameters of around 1mm, were placed in this to simulate breast microcalcifications. The validation of this simulator was obtained through the optical density of the materials used, using as reference the optical density values of the commercial acrylic phantom findings plate. The assembly of the experimental apparatus was carried out by placing the manufactured findings plate on the compression tray of the mammography unit and on top of this a 150 ml silicone prosthesis from the Silimed brand.

4. Results: The optical density obtained on the commercial acrylic phantom finding plate was 2.59. When the density of the manufactured findings board was obtained, it varied between 2.54 and 2.57, thus showing the compatibility of the materials used. In addition, the images obtained with the silicone prosthesis on the constructed findings plate showed a possible interference of the implant in the complete visualization of the breast parenchyma. It was observed that this creates a radiopaque region, which prevents the passage of x-ray beams, and thus, the visualization of early neoplastic structures, mainly in the lower quadrants of the breast. 5. Conclusions: Based on these results, it can be concluded that the mammographic findings plate legitimately simulates neoplastic microcalcifications. In addition, it was noticed that silicone breast implants interfere in the complete visualization of the breast and thus, in the accurate and early diagnosis of breast cancer.

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