

Technical report

PHOTOGRAPHIC PROTOCOL FOR IMAGE ACQUISITION IN BREAST SURGERY.

Ernesto Muñoz-Sornosa ¹, Laura Fuertes-Cortes ¹, Maria Cecilia Rivero-Alvarado ³, Alberto Gimenez-Sancho ², Belen Merck ¹

1. Surgery Department. Cardenal Herrera University. Castellón de la Plana. Spain.
2. ESET Technical School of Engineering. Cardenal Herrera University. Alfara del Patriarca. Spain.
3. Centro de Investigación de Diseño Industrial (CIDI) de la Universidad Nacional Autónoma de México (UNAM)

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ABSTRACT

Breast cancer is the most frequent tumor in women, representing an important cause of morbidity and mortality. Surgical treatment is an important part of multidisciplinary management. In order to help the preoperative planning of breast surgery, most surgeons usually take pictures from different views. There is no standardized photograph protocol for these cases. Our aim is propose possible views that can support the surgical technique.

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1. Introduction

Breast cancer is the most frequent tumor in women. In 2018, the number of new cases of breast cancer reached 522,513 in the European Unit (1). As with other types of solid tumors, surgery is the most common treatment within multidisciplinary management. Surgical treatment of breast cancer can alter the physical appearance of patients and produce important psychological sequelae. Breast reconstruction is part of the comprehensive treatment of breast cancer and should always be performed following the guidelines for cancer surgery and with the most appropriate technique for each patient.

The new oncoplastic techniques, which combine oncological wide resections and cosmesis, require the study of photographic images to design the adequate surgical strategy. A photographic protocol can facilitate the study of the breast preoperatively and analyze the outcomes postoperatively.

This paper presents a standardized, two-dimensional photographic protocol designed to obtain images of the breast in multiple planes. To obtain a good clinical photographic image, a good perspective, uniform lighting and a neutral background are necessary requirements (2).

To obtain these qualities, it is important to standardize the patient's position and photographic technique.

Photographic equipment specifications have been set, considering the multiple variables that each type of photographic equipment offers, thus ensuring that the protocol can be followed by as many people as possible, for both health and non-health related evaluations. An eight megapixels camera is considered the minimum to ensure good image quality. Once images of satisfactory quality have been captured, these confidential images should be stored for future use.

2. Methods

The maximum importance should be placed on the patient's privacy and dignity. To preserve privacy and ensure the patient's comfort during the entire procedure, the following instructions are recommended: The patient must sign a consent form after being informed about the procedure, the use and storage of the images; the maximum privacy of the patient must be guaranteed; avoid unnecessary people being present at the time of taking the photographs; photographs should be taken in an environment with an appropriate temperature; offer the patient a garment with which the torso can be covered while they are being explained the instructions to follow.

* Corresponding author: E Muñoz-Sornosa, munoiz.sornosa@gmail.com

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Ethics

It is important to verify local data protection regulations before processing sensitive data that includes photographs (3). Before taking the photographs, the patient must fill out a written consent form.

Data storage must be secure and comply with current data protection laws (4, 5). This study was approved by the Ethics Committee of the University Cardenal Herrera CEU.

3. Protocol

GCs Patient preparation should follow these indications: removal of the upper garment and the bra so that the entire upper torso is exposed; comb the hair back or gather the hair; remove necklaces or any other elements on the upper torso.

For the environment, choose a well-lit place with enough space. Avoid the presence of shadows or various highlights on the patient's torso.

The background must be neutral and mono color. For the camera settings: select the highest resolution mode the camera has; avoid using zoom.

This protocol comprises a total of 7 pictures (A-G) explained in Figure 1. A minimum of three photographs must be taken from each view. The patient's face cannot be on any photograph. Instructions for taking pictures: In the views A-C the patient must stand. In the D-E views, the patient should be sitting with a hyperextended neck and looking up. In view F, the patient is lying supine. The distance between the woman and the photographer is one meter for the A-C views. Figure 1 shows the precise instructions of the breast surgery image protocol.

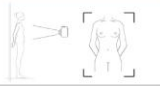
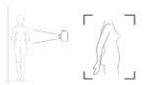




Checklist for optimal acquisition of breast images			
Diagram	View	Areas of the body that should appear in the photograph	Instructions for the photographer
	A General front	- The entire torso should appear, from the middle neck area to the hips. Crossed hands behind the back.	- Back against the wall.
	B Right side	- The right side of the torso should appear, from the middle neck area to the lower part of the right hip. Crossed hands behind the back.	- Left shoulder against the wall.
	C Left side	- The left side of the torso should appear, from the middle neck area to the lower part of the left hip. Crossed hands behind the back.	- Right shoulder against the wall.
	D Superior	- The patient's torso should appear from a higher perspective. It must be done from the clavicle. Crossed hands behind the back.	- The photographer should place the camera at the level of the patient's chin, focusing downwards to obtain a superior plane of the patient's breasts.
	E Inferior	- The patient's torso should appear from a lower perspective. It should be done from four centimeters below the navel (at the level of the hips). Crossed hands behind the back.	- The photographer must place the camera four centimeters below the navel (at the level of the hips) and focus upwards, to obtain a lower view of the patient's breasts.
	F Left and right NAC	- Only nipple areola complex should appear. A picture of each nipple must be taken separately. Crossed hands behind the back.	- If necessary, the patient should take the breast so that the areola and the nipple are perpendicular to the horizontal plane. - Locate the camera in parallel to the nipple areola complex. - Do not zoom.

Figure 1. Checklist and diagrams for optimal acquisition of breast images.

4. Discussion

Conservative treatment for breast cancer is, actually, the preferred management option (6). The surgical technique is influenced by the relationship between tumor and breast volumes. Other factors, such as breast size and ptosis, tumor size and location, or skin involvement may modify the planning of the surgical procedure (7).

The preoperative approach involves image studies, like mammogram, ultrasound and magnetic resonance imaging. When considering the novel oncoplastic techniques, photographs support the preoperative consultation, and contribute as a means of informing the patient. The planning and explanation of scars and expected cosmetic outcome are utilized to reduce the patient's anxiety. All of these preoperative measures can prepare the patient for the possible final result by helping to align the patient's expectations (8).

After surgery, the photographs help in both the monitoring and analysis of the results, providing the surgeon with valuable feedback. No reference to photographic protocols for breast oncoplastic techniques has been found in the literature from recent years (9). Our imaging model, that includes all possible angles, must be contrasted in clinical practice.

5. Conclusions

The variety of oncoplastic treatments offered requires tools for planning and evaluation. This photographic protocol is an affordable and simple instrument to involve the patient in decision-making. The protocol presented in this publication aspires to be integrated into the clinical process of breast cancer.

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