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ORIGINAL ARTICLE

Three-dimensional imaging, an important factor of decision in breast augmentation

L'imagerie en trois dimensions, un important facteur de décision pour l'augmentation mammaire

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KEYWORDS

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Summary

Introduction. — Since the beginning of the 21st century, three-dimensional imaging systems have been used more often in plastic surgery, especially during preoperative planning for breast surgery and to simulate the postoperative appearance of the implant in the patient's body. The main objective of this study is to assess the patients' attitudes regarding 3D simulation for breast augmentation.

Method. — A study was conducted, which included women who were operated on for primary breast augmentation. During the consultation, a three-dimensional simulation with Crisalix was done and different sized implants were fitted in the bra.

Results. — Thirty-eight women were included. The median age was 29.4, and the median prosthesis volume was 310 mL. The median rank given regarding the final result was 9 (IQR: 8–9). Ninety percent of patients agreed (66% absolutely agreed, and 24% partially agreed) that the final product after breast augmentations was similar to the Crisalix simulation. Ninety-three percent of the patients believed that the three-dimensional simulation helped them choose their prosthesis (61% a lot and 32% a little). After envisaging a breast enlargement, patients estimated that the Crisalix system was absolutely necessary (21%), very useful (32%), useful (45%), or

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MOTS CLÉS

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unnecessary (3%). Regarding prosthesis choice, an equal number of women preferred the 3D simulation (19 patients) as preferred using different sizes of implants in the bra (19 patients). *Conclusion.* — The present study demonstrated that 3D simulation is actually useful for patients in order to envisage a breast augmentation. But it should be used as a complement to the classic method of trying different sized breast implants in the bra.

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Résumé

Introduction. — Depuis le début du 21^e siècle, l'imagerie en trois dimensions est de plus en plus utilisée en chirurgie et notamment en préopératoire dans la chirurgie mammaire pour simuler l'apparence de l'implant mammaire. L'objectif principal de l'étude est d'évaluer l'impression des patientes sur l'usage de l'imagerie 3D dans la mastoplastie d'augmentation.

Méthode. — L'étude inclut les patientes opérées d'une augmentation mammaire primaire ayant bénéficié en préopératoire d'une simulation 3D avec Crisalix et l'essai de prothèses dans le soutien gorge.

Résultats. — Trente-huit patientes étaient incluses. L'âge médian était de 29,4 ans et le volume médian implanté de 310 mL. La note donnée au résultat final est de 9/10 (IQR : 8–9). Quarante-vingt-dix pourcent des patientes sont d'accord que le résultat final est similaire à la simulation par Crisalix (66 % absolument d'accord et 24 % partiellement). Quarante-vingt-treize pourcent des patientes pensent que la simulation les a aidées à choisir leurs prothèses (61 % beaucoup et 32 % un peu). Pour envisager une augmentation mammaire, 21 % des patientes estiment que Crisalix est absolument nécessaire, 32 % qu'il est très utile et 45 % utile. Et 3 % inutile. Pour le choix des prothèses, autant de patientes préfèrent l'essai de prothèse dans le soutien gorge (19 patientes) que l'usage de Crisalix (19 patientes).

Conclusion. — L'étude démontre qu'actuellement la simulation en trois dimensions est utile pour envisager une augmentation mammaire. Mais elle doit être utilisée comme un complément de la méthode classique d'essai de prothèse dans le soutien-gorge.

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Introduction

Since the beginning of the 21st century, three-dimensional imaging systems have been used more often in plastic surgery, especially during preoperative planning for breast surgery and to simulate the postoperative appearance of the implant in the patient's body [1–7].

3D surface imaging of a breast allows doctors to determine the influence of implant parameters on breast shape after augmentation mammoplasty. It may assist in preoperative planning by providing an example of how implants impact the breast shape. It may help patients to visualize the results of their breast augmentation, and to meet the patients' expectations for both volume and shape. It may also offer a better form of communication with patients about the expected breast shape and size and the choice of the prosthesis. The accuracy of three-dimensional imaging has been demonstrated for different systems [8–11].

Before the emergence of 3D simulation, the most commonly used method for determining the best implant size and form for a breast augmentation was a simulation that places numerous different-sized trial implants in the patient's bra [12,13]. However, do patients prefer the modern 3D simulation method? Will the use of implants in the bra become obsolete with the use of 3D breast simulation becoming more necessary for envisaging breast augmentation?

The main objective of this study is to assess the patients' attitudes regarding 3D simulation for breast augmentation and to evaluate the subsequent benefits.

Methods

A study was conducted in the plastic surgery department of the University Hospital of Nancy (Nancy, France), which included women who were operated on for primary breast augmentation from December 2014 to July 2016.

All women were operated on using the same breast augmentation protocol that consisted of inserting round microtextured silicone gel implants subpectorally through an inframammary incision.

The exclusion criteria were the presence of tuberous or congenital breast deformity, past reconstructive surgery, secondary or revision surgery, unilateral augmentation, the need for a concurrent mastopexy, or being male.

All breast augmentations were performed by the same operator (ES).

All patients received a minimum of two consultations before undergoing breast enlargement surgery.

During the consultation, a three-dimensional simulation with Crisalix was done and different sized implants were fitted in the bra in order to determine the correct implant size.

Crisalix (Crisalix, Switzerland) is a web-based 3D simulator for plastic surgery and aesthetic procedures. The program creates 3D surface images from three 2D images taken with a consumer camera and uses physical distance measurements of the patient's anatomy and a set of landmarks (Fig. 1).

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