

Comparison of objective and subjective evaluation of breast symmetrization results in patients with Poland syndrome

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ABSTRACT:

Introduction: There are many methods of analyzing the appearance of the breasts, but most of them are based on the patient's subjective assessment or on the opinion of a specialist panel. Anthropometric measurements enable objective breast evaluation. The aim of the study was to compare the objective and subjective evaluation of aesthetic results of breast symmetrization in patients with Poland syndrome.

Material and methods: The analysis of the results of the treatment was performed in 7 patients treated surgically due to unilateral breast underdevelopment in Poland syndrome. In the postoperative assessment, the following features were considered: 1 - breast volume, symmetry of: 2 - nipple areola-complexes (NAC), 3 - inframammary folds (IMF), 4 - upper poles (UP). The subjective assessment performed by the patient included each of the listed features and the overall satisfaction with the results of symmetrization on the 10-point Likert scale. Then, objective metric breast analysis was performed.

Results: Overall assessment of postoperative breast asymmetry (mean 8.1) indicates a high level of patients' satisfaction with breasts symmetrization. An objective analysis showed that the average breasts' difference in volume was about 36 cc and the difference in NAC location was about 1.2 cm.

Conclusion: 3D imaging is helpful in planning breast symmetrization procedures, especially in breast prostheses' selection. Combination of this method with clinical experience results in good postoperative effects.

KEYWORDS:

breast asymmetry, breast symmetrization, 3D imaging

INTRODUCTION

Breast asymmetry occurs in almost all women, so it can be considered a physiological image of the female chest, but usually it remains almost imperceptible and does not affect the appearance. The perception of breast symmetry consists of the following features: their size, the location of nipple-areola complexes (NAC), the level of inframammary folds (IMF), and the upper poles (UP) of the breast. In addition, the characteristic feature of the breasts is their „footprint” and shape (1). However, in some cases, asymmetry of the breast is significant and makes the affected woman search for methods of its correction. For example, in the Poland syndrome, the range of deformities may vary from mild asymmetry to a complete absence of breast with athelia (2). In addition, breast disorders in these patients may coexist with a developmental anomaly of the contralateral breast, such as the tubular breast, which further complicates planning of symmetrization procedures.

Chest asymmetry treatment related to breast underdevelopment may include the following procedures: breast augmentation with silicone implants, sometimes with earlier tissue expansion, latissimus dorsi flap, with or without a skin paddle, DIEP flap (skin flap from the lower abdomen based on perforator from the deep inferior epigastric artery), liposuction, fat transfer, as well as procedures on healthy breast (reduction mastopexy, mastopexy, liposuction) (3,4).

There are many methods to analyze the appearance of the breast, but the majority is based on the patient's subjective assessment or on the opinion of a specialist panel (usually an operator or specialists of the related field). These methods, however, are charac-

terized by low reproducibility, which limits their application in researches, but still they are widely used in clinical practice (5,6). Anthropometric measurements enable objective breast evaluation. Breast symmetry is the most important from an aesthetic point of view, and its analysis requires evaluation of the volume of breast eminence. One of the methods of breast volume analysis is three-dimensional imaging using 3D scanners (optical or laser) or stereophotography, which allows to obtain a 3D model using specialist computer programs (7, 8). Other features describing breast symmetry (KBO position, level of inframammary folds, and upper poles) can be evaluated with indirect anthropometry or by making direct measurements (9, 10). There are just a few papers describing the relationship between the subjective and objective evaluation of breast symmetry.

The aim of the study was to compare the objective and subjective evaluation of aesthetic results of breast symmetrization in patients with Poland syndrome.

MATERIAL AND METHOD

The analysis of the results of the treatment was performed in 7 patients operated on in the Plastic, Reconstructive and Aesthetic Surgery Clinic due to breast asymmetry in Poland syndrome, without coexisting skeletal disorders within the chest, in the years 2014-2016. All patients were qualified to augmentation of the underdeveloped breast with a silicone implant, and the size of the implant was selected on the basis of the size of the other breast and chest measurements. A preoperative measurement of breasts' volumes was also performed to assess the difference in size,

Tab. I. Postoperative subjective and objective breast symmetrization assessment.

LP	SUBJECTIVE ASSESSMENT					OBJECTIVE ASSESSMENT				
	Volume	NAC	IMF	UP	Overall score	Volume difference* (cc)	NAC placement difference** (cm)	IMF difference***	UP difference**** (cm)	
350 periareolar mastopexy	0	1	0	0	8	+35	+2	0	+2	
280 mastopexy	1	0	0	0	7	+50	+1	0	+1	
220/-	0	0	0	1	9	+30	+1	0	+1	
240/-	1	0	0	1	8	+40	+1	0	0	
300/-	1	2	1	0	7	+40	+2,5	-2	0	
325/-	0	1	0	1	8	+35	+1	-1	+2	
220/-	0	0	0	0	10	+20	0	0	0	
Mean	0,43	0,57	0,14	0,43	8,1	35,7	1,2	0,43	0,86	

* + breast with prosthesis bigger; – healthy breast bigger; ** + nipple-areola complex (NAC) of the enlarged breast higher; – NAC of healthy breast higher

*** + inframammary fold of the enlarged breast higher; – IMF of healthy breast higher; **** + upper pole of the enlarged breast higher; – UP of healthy breast higher

which was helpful in the selection of prostheses. The volumes of the prostheses ranged from 220 to 350 cc (Eurosilicone). In 2 patients, additionally, the procedure of healthy breast (mastopexy) symmetrization was performed. In the postoperative assessment conducted 6 months after the completion of all stages of treatment, the following features were taken into consideration: 1 - breast volume, symmetry of: 2 - NAC, 3 - IMF, 4 - UP. A subjective assessment performed by the patient included each of the listed features separately, on a scale of 0-2 points, where 0 - no visible asymmetry, 1 - slight asymmetry, 2 - visible, significant asymmetry. In addition, the patient rated his overall satisfaction with the result of symmetrization on the 10-point Likert scale, where 0 - very dissatisfied (unsatisfactory aesthetic effect), 10 - very satisfied (very good aesthetic effect). An objective analysis was based on measurements of breast volume and positions differences of NAC (distance from sternal notch), IMF, and UP. Volume measurements were performed on a three-dimensional breast model obtained with the use of the Creaform Gemini 3D scanner. Then, we compared the outcome of the subjective assessment performed by the patient with objective metric analysis. Due to the small number of patients and preliminary nature of these reports, statistical data analysis was not performed and the results are descriptive.

RESULTS

The results of subjective assessment have shown that patients assessed postoperative symmetry of the position of IMF as the best. The scores of breasts size and UP were similar and a mean of 0.43 indicates a good assessment of these features. The highest scores (worse result) (mean 0.57) were attributed to the symmetry of the NAC location. Overall assessment of postoperative asymmetry of the breasts (mean 8.1) indicates a high level of patients' satisfaction with breast symmetrization. The objective analysis showed

that the average breasts' volume difference was about 36 cc and the difference in NAC location was about 1.2 cm. The smallest asymmetry was obtained for the IMF position. In addition, it was observed that patients whose augmented breast was 30-35 cc bigger, did not observe subjective asymmetry of the breasts and assessed their sizes as equal. Patients with a difference of 40-50 cc observed a slight asymmetry. The difference in NAC position of 1 cm was assessed as lack of asymmetry and 2-2.5 cm as minor or significant asymmetry (Tab. I, Fig 1a, b and 2a, b).

DISCUSSION

The presented analysis is a preliminary report concerning a comparison of subjective aesthetic evaluation of the breasts with objective metric analysis of the breasts after symmetrization procedure in patients with Poland syndrome. Despite a limited number of patients and the descriptive character of the results, these observations may be helpful in planning symmetrization. The results showed a high subjective note of the aesthetic results of the performed operations. The worst score was noted for NAC symmetry. A comparison of subjective assessment with objective metric evaluation showed that only at a volume difference of about 40 cc patients observed a visible small asymmetry of breast sizes. Symmetrizations were associated with a mean asymmetry of NAC position of about 1.2 cm, but for most of the patients, the difference of 1 cm was not noticeable.

In this study, for the purpose of postoperative breast volume assessment, a 3D imaging - optic 3D scanner was applied. In many researches, this method of breast volume evaluation was verified as reliable and reproducible (7, 11, 12). Henseler et al. (2012) used this method to assess symmetry in breast reconstruction with the use of a latissimus dorsi flap and found that the reconstructed breast was

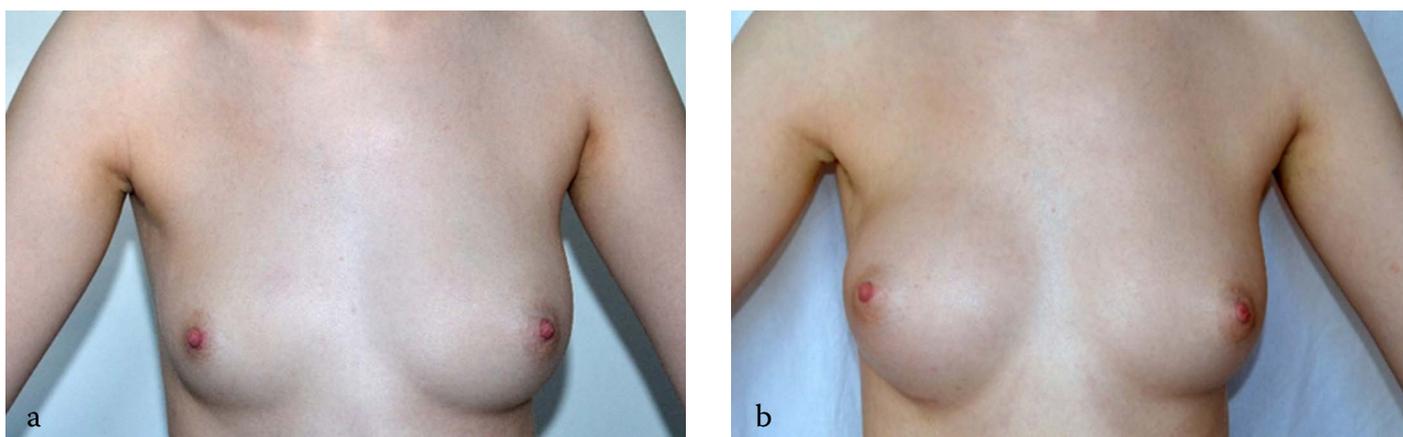


Fig. 1. The patient with Poland syndrome (a) and after submuscular 220 cc prosthesis implantation, with postoperative breasts' volume difference of 30 cc (b).

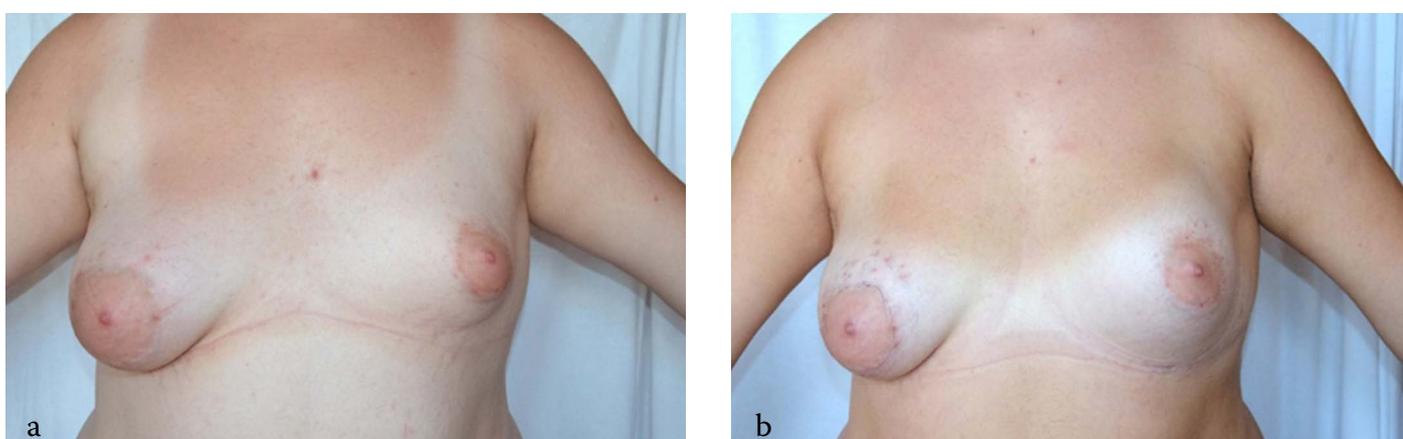


Fig. 2. The patient with Poland syndrome (a) and after subglandular 350 cc prosthesis implantation, with postoperative breasts' volume difference of 35 cc, before planned periareolar mastopexy (b).

approximately 177 cm³ smaller than the healthy one (11). At the same time, Yip et al. (2015) analyzed women's satisfaction of breast reconstruction in correlation with postoperative breast symmetry and did not observe any significant relationships between these variables. They found that, despite apparent asymmetry, women reported a high level of satisfaction with reconstructive procedures, but for those who underwent symmetrization, a significant rise in satisfaction related to the appearance of the breast was noted (13). However, the mentioned studies included women after breast reconstruction, which may affect the specificity of the reconstructed breasts' assessment. Many authors highlight the importance of breast volume estimation in planning reconstructions and symmetrizations, and 3D imaging has a crucial role in such evaluation (14-16). In our patients with asymmetrical breasts due to Poland syndrome, it was found that in all women, the augmented breast was bigger than the one on the healthy side (average 36 cm³). However, this difference in the breasts' volume did not cause visible breast asymmetry. The fact that breasts' asymmetry of 40 cm³ gives a small but noticeable

asymmetry, makes precise breast implant selection crucial, and the volumes of healthy and underdeveloped breasts should be analyzed. This seems to be especially important in patients with congenital breast asymmetry such as the Poland syndrome.

The main limitation of the research is a small number of cases. This is due to the desire to unify the group of patients with breast asymmetry and inclusion of only those with asymmetry related to Poland syndrome. Moreover, we excluded patients with bony deformities of the chest, which often coexist with muscles and gland underdevelopment. Also, the low frequency of Poland syndrome (1:30 000) should be taken into account and the fact that more often, men are involved.

In conclusion, 3D imaging is helpful in planning breast symmetrization procedures, especially in breast prostheses selection. Combination of this method with clinical experience results in good postoperative effects.

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