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Original article

Comparison Among the Levels of Patients' Satisfaction According to the Surgical Technique Used in Breast Reconstruction After Mastectomy☆

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ABSTRACT

Background: It has been proved that a breast reconstruction after a mastectomy has a great psycho-social impact on patients. For this reason, it is increasingly done in a greater percentage of cases. There are two major groups of reconstructive techniques: a reconstruction with implants and a reconstruction with autologous tissue of the patient. In order to make a more objective assessment of the results, it is important to know how satisfied these patients are with the results. Therefore, we performed a study using Q-BREAST, the aim of which is to analyze the satisfaction of mastectomized patients according to the different surgical reconstruction techniques.

Methods: A retrospective, descriptive and observational study of patients reconstructed in our service from 2008 to 2011 was carried out. Patient satisfaction levels were compared according to the surgical technique used in breast reconstruction using the Q-BREAST test, which was mailed to them.

Results: There are no statistical differences in the levels of satisfaction in terms of age, type of mastectomy done, coadjutant treatment or existence of complications. Higher levels of satisfaction are observed in patients reconstructed with autologous tissue versus implants (P=.028).

Conclusions: Patients reconstructed with autologous tissue have higher levels of satisfaction than those reconstructed with implants.

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Valoración de la satisfacción en pacientes mastectomizadas con reconstrucción mamaria según la técnica quirúrgica empleada

Palabras clave:
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Proceso reconstructivo quirúrgico
Reconstrucción mamaria
Satisfacción del paciente

RESUMEN

Introducción: La reconstrucción mamaria tras mastectomía ha demostrado tener un impacto psicosocial muy importante en las pacientes. Existen 2 grandes grupos de técnicas reconstructivas: la reconstrucción con implantes y la reconstrucción con tejido autógeno de la paciente. Para poder realizar una valoración más objetiva de los resultados es importante conocer la satisfacción que presentan las mismas, por lo que se decide realizar un estudio empleando el Q-BREAST cuyo objetivo es analizar la satisfacción de las pacientes mastectomizadas en función de las diferentes técnicas quirúrgicas de reconstrucción.

Métodos: Se realiza un estudio retrospectivo, descriptivo y observacional de las pacientes reconstruidas en nuestro servicio del 2008 al 2011. Se comparan los niveles de satisfacción de las pacientes según la técnica quirúrgica empleada en la reconstrucción de mama mediante el empleo del test Q-BREAST, que se les envió por correo.

Resultados: Se obtiene una respuesta al Q-BREAST de 90 pacientes. No se encuentran diferencias estadísticas en los niveles de satisfacción en relación con la edad, el tipo de mastectomía realizada, el tratamiento coadyuvante y la existencia de complicaciones. Sí se observan unos niveles superiores de satisfacción en las pacientes reconstruidas con tejido autógeno frente a los implantes ($p = 0,028$).

Conclusiones: Las pacientes reconstruidas con tejido autógeno presentan niveles más altos de satisfacción que las reconstruidas con implantes.

Introduction

Breast cancer is currently a disease of considerable interest given its high incidence in developed countries.[1] Its surgical treatment has evolved from the radical mastectomy of Halsted[2] to the current trend of performing breast-conserving surgery whenever possible. However, mastectomy is often necessary.

To minimize the psychological effect of the resulting change in breast shape,[3] the possibility of breast reconstruction is offered to these patients. Breast reconstruction methods can be divided into 2 groups:

- Reconstruction with implants: either with direct prosthesis or in two stages with the use of an expander and subsequent replacement with a definitive prosthesis.
- Reconstruction with autogenous tissue: pedicle flaps (latissimus dorsi with or without underlying prosthesis) and distance flaps or ''free flaps'' require microsurgical techniques.

Since 1983, when the British National Health Service recommended the assessment of patient satisfaction in order to determine the quality of the health service provided,[4] many surveys have proliferated to analyze the efficacy and effectiveness of healthcare interventions.

In 2007, Pusic et al.[5] performed a systematic review of all the published questionnaires that were answered by patients after breast surgery. Of these, only the Breast-Related Symptoms Questionnaire (BRSQ), which assesses results after breast reduction, demonstrated adequate development and validation.

Therefore, these same authors published another article[6] in which they presented a new questionnaire, the Q-BREAST, which made up for the shortcomings of the previous surveys and presented adequate development and validation.

After confirming this growing relevance that is given to the opinion of patients about their own surgical results, we decided to conduct a study using the Q-BREAST, which aims to analyze the satisfaction of mastectomy patients according to different surgical reconstruction techniques.

Methods

a. *Study design:* we carried out a retrospective, descriptive, observational study that included all patients who had undergone breast reconstruction secondary to cancer surgery at the Reconstructive and Plastic Surgery Department of the Hospital Universitario Miguel Servet from January 1, 2008 until December 31, 2011. Excluded from the study were those patients who, at the time of data collection, had not yet completed the reconstructive process, presented active breast cancer disease, or had deceased.
b. *Instrument for measurement:* the satisfaction data were obtained with the Q-BREAST test, which is comprised of 2 general topics (or domains), with 3 subsections each:
   1. Patient satisfaction
      - Satisfaction with the breast
      - Satisfaction with the general result
      - Satisfaction with the medical care

2. Patent quality of life
   - Physical wellness
   - Psychosocial wellness
   - Sexual wellness

c. *Field work*: the Q-BREAST test was distributed by mail in May 2013, together with an informational letter explaining the study and an informed consent form, to all the patients of the study. A pre-paid envelope was included to mail the completed questionnaire. One month later, the patients who had not submitted the questionnaire were contacted by telephone, and they were encouraged to participate.

d. *Variables for study:* age, type of mastectomy, type of reconstructive surgery used, coadjuvant treatment and existence of complications.

The object of the study was the breast reconstruction performed and patient satisfaction. Because bilateral cases have frequently been treated with different reconstruction types, each of these patients have been considered 2 patients treated surgically for one breast.

Statistical Analysis

The data obtained were input into an Excel spreadsheet and then imported to SPSS V20.0 for statistical analysis.

For the study of the variables that presented normal distribution, the Student's *t* test was for the comparison between 2 quantitative variables and the chi-squared for qualitative variables, using ANOVA techniques (analysis of univariate variance) if there was more than one independent variable.

In the case of variables of normal distribution that were divided into small groups, the normality within each group was recalculated with the Shapiro–Wilk test (for samples less than 50 cases) or the Kolmogorov–Smirnov test (for larger samples). Those who did not follow a normal distribution were interpreted with a non-parametric test.

The non-parametric test used in the comparison of 2 variables was the Mann–Whitney *U* test. When there were more than 2 independent variables, we used the Kruskall–Wallis test or the analysis of the range variance.

Results

a. *Degree of participation and description of the series:* The rate of response was 60.7% as in the end a total of 90 patients responded to the letter out of the 143 included, 15 of which had bilateral reconstruction, so the total number of cases of breast reconstruction that responded to the Q-Breast was 105.Some of the patients who did not fill out the questionnaire explained that their reasons for not participating in the study included a desire to forget the entire traumatic oncologic-reconstructive process, or due to lack of time to respond.Patient age ranged from 29 to 77, with a mean of 49.2±9, which we divided into 3 groups: younger than 45, 45 to 55 and older than 55.In almost half of cases (46%), a modified radical mastectomy was used. In 29% of cases, simple mastectomy was done with an intraoperative sentinel lymph node study, and in the remaining 25% simple mastectomy was done exclusively or subcutaneous mastectomy with no associated sentinel lymph node surgery.According to the type of reconstruction done, 70% of the cases were reconstructed with implants and 30% with autogenous tissue.As for coadjuvant treatment, chemotherapy was administered in 64% of patients, chest wall radiotherapy over breast site in 25% and axillary in 13%. The percentage of patients who received hormone therapy was 74%.When we evaluated the coadjuvant treatment of each patient overall, only 6% did not need any type of coadjuvant treatment, while 9% received the 4 types of adjuvant treatment: chemotherapy, breast radiotherapy, axillary radiotherapy and hormone therapy. The most common treatment was chemotherapy plus hormone therapy (31%), followed by treatment with hormone therapy alone (20%).The rate of appearance of complications was 25%, divided according to Fig. 1.

b. *Degree of satisfaction and overall quality of life:* to assess the levels of patient satisfaction, data were used from the Q-BREAST questionnaire, meaning, the score obtained from each patient in the domain of ''patient satisfaction'', the ''quality of life'' domain and in the weighted sum of both, which we call ''total or overall satisfaction''.

c. *Assessment of satisfaction according to variables not related with reconstruction:* no significant differences were found in the total levels of patient satisfaction according to age (P=.6), type of mastectomy (P=.2), coadjuvant treatment: chemotherapy (P=.61), breast radiotherapy (P=.61), axillary radiotherapy (P=.64) and hormone therapy (P=.14) or complications (P=.43) (Table 1).

d. *Assessment of satisfaction according to the type of reconstruction performed:* when the breast reconstruction types were compared, a tendency was observed towards greater ''total satisfaction'' and ''quality of life'' in patients reconstructed

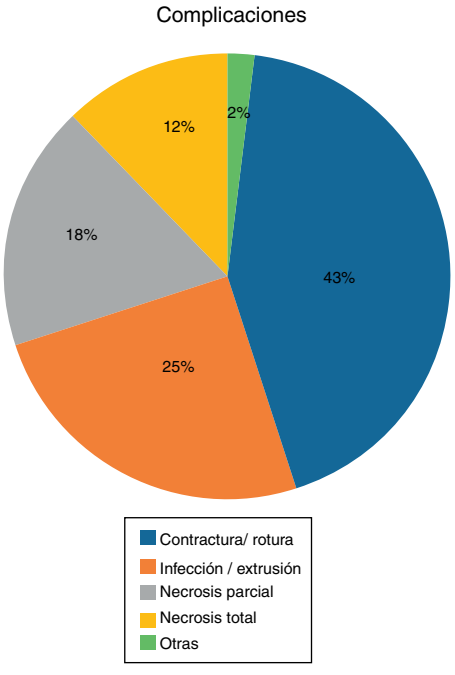

Fig. 1 – Types of complications.

Table 1 – Measures of Central Tendency, Range and *P* Value of Overall Variables: Age, Type of Mastectomy, Coadjuvant Treatment and Complication.

	Patient Satisfaction					Quality of Life					Total Satisfaction				
	Mean	Median	Standard Deviation	Range	*P*	Mean	Median	Standard Deviation	Range	*P*	Mean	Median	Standard Deviation	Range	*P*
Age (years)															
<45	76.251	77.145	16.5323	60.43	.503	68.177	66.875	18.4757	80.33	.878	73.754	76.705	15.6937	65.5	.664
45–55	73.969	76.575	15.8471	62.5		68.078	69.835	15.1	75.33		72.07	74.29	14.4304	63.8	
>55	77.918	81.14	16.7829	61.33		69.966	73.33	16.4628	61.5		75.322	80.89	15.5222	60.89	
Mastectomy type															
MRM	78.056	81.17	16.5718	63.67	.133	70.647	72	14.0054	52.67	.53	75.706	77.55	14.1424	54.78	.208
MS + SLN	70.989	75.5	16.6707	60		67.228	67.75	17.7228	75.33		69.865	72.84	16.3523	64.57	
MS or MSC	73.827	78.88	17.1942	64		66.918	72.085	20.744	72.66		71.392	77.1	16.9569	62.7	
Chemotherapy															
Yes	75.874	79.5	18.1782	64	.262	68.158	70	16.5986	77.33	.54	73.401	77.33	16.3913	66.9	.616
No	73.398	77.43	13.8877	56.19		70.39	70.67	16.2966	66		72.437	75.9	13.5884	59.29	
Breast radiotherapy															
Yes	79.162	80.515	15.807	62.5	.167	67.605	70	16.8823	80.33	.505	75.15	77.325	14.9603	65.3	.608
No	73.618	76.86	17.0536	64		69.354	70.67	16.39	77.33		72.359	75.9	15.6532	66.9	
Axillary radiotherapy															
Yes	81.491	79.86	11.245	36	.174	65.897	69	12.8904	43.42	.348	76.195	77.55	10.0396	33.31	.64
No	74.29	77.43	17.1169	64		69.894	70.67	16.3295	80.33		72.934	76.5	15.771	66.9	
Hormone therapy															
Yes	73.807	76.86	17.0502	62.71	.077	68.357	70.67	16.4811	80.33	.519	72.076	76.2	15.6932	66.9	.142
No	82.19	81.235	14.3206	41.86		71.328	78.33	17.5934	59		78.591	81.405	13.9206	45.58	
Complications															
Yes	78.816	78.83	13.6313	53.71	.359	69.831	71	15.5652	64	.63	75.819	76.2	12.6659	49.8	.433
No	74.473	78.86	17.1438	64		68.126	69	16.8453	77.33		72.502	76.4	15.9067	66.9	

MRM: modified radical mastectomy; MS + SLN: mastectomy + sentinel lymph node; MS or MSC: simple mastectomy or subcutaneous mastectomy.

with autogenous tissue versus reconstructions with implants (although the difference was not statistically significant: P=.74 and .16, respectively).However, when we compared ''patient satisfaction'', there were significant differences, and the patients with autogenous tissue reconstruction were more satisfied than those with implants (P=.028) (Table 2).

e. *Assessment of satisfaction according to reconstruction type with implants:* within the groups reconstructed with implants, 25% (18 patients out of 73) did so with the placement of a direct prosthesis and 75% (55 cases out of 73) with a 2-stage reconstruction: expander and later substitution with prosthesis.When we compared the levels of satisfaction between the two groups, we observed that, although all the levels of satisfaction are superior in the patients reconstructed in 2 stages (expander and prosthesis) versus those who were reconstructed with direct prosthesis; these differences were not statistically significant (''patient satisfaction'' P=.15; ''quality of life'' P=.15 and ''total satisfaction'' P=.12).

f. *Assessment of satisfaction according to the reconstruction type with autogenous tissue:* out of the cases reconstructed with autogenous tissue, 34% (16 cases) were latissimus dorsi with prosthesis and the remaining 64% were exclusively autogenous tissue, divided in turn into latissimus dorsi without prosthesis (6.7%, 3 cases) and Transverse Rectus Abdominis Muscle flap (TRAM) and free flaps (57.8%-26 cases).After the statistical study, no significant differences were observed between the 3 types of ''reconstruction with autogenous tissue'' and the levels of satisfaction, including ''patient satisfaction'' (P=.69), ''quality of life'' (P=.22), and ''total satisfactions'' (P=.39) (Table 3).

When performing the statistical study, prior to the assessment of satisfaction levels, we observed that several variables correlated with each other. A correlation was observed between the main variable of our study, the ''type of reconstruction'' performed and other variables such as the ''type of mastectomy'' (P=.001), treatment with chemotherapy (P=.005), with radiotherapy of the chest (P=.001) and with axillary radiotherapy (P=.0001).

These correlations indicate that the choice of reconstructive surgical technique is often determined by the type of previous mastectomy that has been performed and whether or not patients have received coadjuvant treatment. Thus, a positive correlation was observed between reconstructions with implants and a simple mastectomy and no coadjuvant treatment. Likewise, a positive correlation was found between reconstruction with autogenous tissue and a modified radical mastectomy and the administration of adjuvant treatment, chemotherapy or radiotherapy.

Discussion

Several studies[7–9] have demonstrated the psychological impact that mastectomy causes in patients who present it. Therefore, if the oncological disease is controlled, breast reconstruction is offered by our service. Most of the reconstructions at our hospital are performed with implants, and

Table 2 – Measures of Central Tendency, Range and *P* Value According to the Type of Breast Reconstruction.

	Patient Satisfaction					Quality of Life					Total Satisfaction				
	Mean	Median	Standard Deviation	Range	P	Mean	Median	Standard Deviation	Range	P	Mean	Median	Standard Deviation	Range	P
Reconstruction with implants	73.397	76.86	16.6369	62.71	.028	68.976	69	15.8368	77.33	.745	72.142	74.78	15.2042	66.9	.169
Reconstruction with autologous tissue	81.133	80.515	14.1217	64		67.838	71	17.9245	80.33		76.538	77.55	14.4242	65.3	

Table 3 – Measures of Central Tendency, Range and P Value According to Type of Reconstruction With Implants.

	Patient Satisfaction					Quality of Life					Total Satisfaction				
	Mean	Median	Standard Deviation	Range	*P*	Mean	Median	Standard Deviation	Range	*P*	Mean	Median	Standard Deviation	Range	*P*
Direct prosthesis	68.891	75.77	17.9313	56.86	.157	64.325	61	17.6145	75.33	.151	67.562	70.45	16.8947	62.4	.124
Expander + prosthesis	75.332	77.29	16.1581	62.38		70.523	70.67	15.0861	63		73.97	76.3	14.5579	60.89	

74% were performed with autogenous tissue. This percentage is similar to that observed in the United States in a study similar to ours, with a reconstruction rate with implants of 70% and with autogenous tissue of 30%.[3]

In our study, when comparing the levels of satisfaction between the 2 major types of reconstruction, implants versus autogenous tissue, we observed that the values of the 3 satisfaction variables (''patient satisfaction'', ''quality of life'' and ''total satisfaction'') are superior in the reconstructed group with autogenous tissue. However, it is true that these differences were only statistically significant for the ''patient satisfaction'' variable (*P*=.028).

This could be due to a more natural appearance of the resulting breast, which undergoes the typical changes of the effect of time, similar to other tissues, such as ptosis or volume change due to weight gain or loss. And this similarity of appearance, together with a natural feel of the reconstructed breast that resembles the previous breast, makes the patient accept it as part of her body and feel more satisfied.

Our results coincide with the report by Alderman et al.,[10] who observed higher levels of satisfaction in patients reconstructed with abdominal flaps versus implants. Similarly, Tonseth et al.[11] obtained higher levels of satisfaction and an improvement in interpersonal relationships as well as a higher score on the visual analogue scale of the aesthetic results in patients reconstructed with Deep Inferior Epigastric Perforator flap (DIEP) versus reconstructions with implants.

Comparable results were obtained by Saulis et al.[12] and Yueh et al.,[13] who included reconstruction with latissimus dorsi in their comparison. Saulis et al. found no difference in satisfaction between the reconstruction with abdominal autogenous tissue or with latissimus dorsi, results similar to those of our study. However, in his study, Yueh et al. observed greater satisfaction in those reconstructed with abdominal flaps (DIEP and TRAM) than those reconstructed with latissimus dorsi.

In our study, when we compared only the patients reconstructed with implants, greater satisfaction was observed in patients with two-stage reconstructions compared to those who were reconstructed with a direct prosthesis. Although this difference was not statistically significant, this higher level in the 3 satisfaction variables supports two-stage reconstruction in cases of reconstruction with implants. This may be due to the fact that, despite needing 2 surgeries and tissue expansion time, the definitive prosthesis outcome is more natural since the breast groove can be better located and the tissues better adapt to the prosthesis.

The remaining variables, such as age, type of mastectomy performed, coadjuvant treatment, existence of complications and types of autogenous reconstruction, did not present statistically significant differences in terms of satisfaction levels.

In addition, in our study we observed a correlation between different variables, which we recognize as a study limitation. This correlation is positive between reconstruction with autogenous tissue and having undergone a more aggressive mastectomy (modified radical mastectomy) or having received coadjuvant treatment.

We believe that this is due to the fact that most of the time the reconstruction is done with autogenous tissue (which is a

more complex surgical technique and requires longer operating room occupancy) for patients who comply with the aforementioned variables (modified radical mastectomy with coadjuvant treatment, mainly radiotherapy of the chest wall over the mammary bed), since it leaves scar tissue that is poor in quality for the placement of an implant.

Therefore, it is possible that these correlations influence actual levels of satisfaction. It is understandable that having undergone more aggressive breast cancer surgery and received coadjuvant treatment, with the associated side effects, could negatively influence the patient's overall perception of her disease and treatment.

Therefore, if we avoided this correlation that a priori can negatively influence patient satisfaction, the levels of satisfaction after reconstruction with autogenous tissue would be higher than those obtained. To do so, we would have to expand the number of cases to be able to make a comparison between the group reconstructed with prosthesis and the group with autogenous tissue, previously eliminating these possible confounding factors.

Hence, we conclude that reconstruction with autogenous tissue should be offered to a greater percentage of patients, regardless of the variables or the longer surgical time, as this procedure provides a higher level of satisfaction than reconstruction with implants.

Finally, within the group reconstructed with implants, given that we have observed greater satisfaction (although not statistically significant) in patients reconstructed with expanders and subsequent replacement by definitive prosthesis compared to those who received a prosthesis directly, we prefer recommending two-stage breast reconstruction.

Authors' contribution

Lucía Gómez-Escolar Larrañaga: study design, data collection, article composition.

Julio Delgado Martínez: analysis and interpretation of the results and approval of the final version.

José María Miguelena Bobadilla: study design and critical review.

Conflict of Interests

The authors have no conflict of interests to declare.

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