

Quality of Life in Breast Cancer Survivors: Comparative Study of Mastectomy, Mastectomy with Immediate Transverse Rectus Abdominis Musculocutaneous Flap Reconstruction and Breast Conserving Surgery

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Background: Surgical treatment of early-stage breast cancer either with mastectomy alone, mastectomy with reconstruction, or breast-conserving surgery (BCS) is equivalent in terms of disease control. Therefore, the choice of surgical procedures often depends on quality of life (QoL) consideration. Conflicting data exists whether which surgical procedure results in better QoL.

Objective: To examine long-term effects of different surgical treatments on QoL in Thai women with breast cancer

Material and Method: Two hundred and sixty-five women who underwent mastectomy alone (TM) ($n = 113$), BCS ($n = 109$) and mastectomy with immediate transverse rectus abdominis muscle flap reconstruction (TM-TRAM) ($n = 43$) were included in the study. QoL was assessed at least 6 months after completion of definitive treatment using the Functional Assessment of Cancer Therapy-General and Breast Cancer Specific (FACT-G and FACT-B).

Results: There was no difference in occupation, graduation, marital and menopausal status of patients among the three groups. However, women who underwent BCS presented at an earlier stage and received fewer axillary lymph node dissection than those with TM or TM-TRAM. During long-term follow-up period (6 months to 10 years after surgery), women in all groups experienced relatively high QoL (>80%) in physical and emotional domains. In multivariate regression analyses adjusted for age, stage, type of axillary surgery, and type of nonsurgical treatment, there was no significant difference in QoL among the three groups ($p = 0.056$ for FACT-G and $p = 0.275$ for FACT-B).

Conclusion: This comparative report of QoL assessment in Thai breast cancer patients demonstrated that QoL in general aspects and breast-specific symptoms are not better in women who undergo BCS or TM-TRAM than in women who have TM. Counseling for surgical option and letting the patient participate in decision-making might improve emotional well-being and satisfaction.

Keywords: Breast cancer, Quality of life, Breast conserving surgery, Total mastectomy, Immediate breast reconstruction

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Breast is an important organ for women in term of beauty that affects their emotional expression and married life. Surgery is the main modality for local control of the disease. In the past, in order to achieve the best result and to prevent a recurrent of the disease,

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extensive surgery was mandatory⁽¹⁾. In the presence of advanced adjuvant treatment and better understanding of breast cancer biology, such invasive surgery was demoted. At present, breast conserving surgery (BCS) is used as a surgical procedure to maintain beauty, not affect either recurrence of disease or survival outcome and results in improvement of quality of life (QoL)⁽²⁾. In fact, the remaining parts of the breast make patients become much more worried^(3,4) that there could be remaining cancer and could lead to recurrence of cancer^(3,5). Subsequently, results in worse survival

outcomes or side effects of radiotherapy or chemotherapy reduce QoL^(6,7).

Breast reconstructions after total mastectomy (TM) became alternative to BCS. Reconstruction may employ an autologous flap or prosthesis. The aim of immediate breast reconstruction is to improve QoL because of cosmesis and relieve anxiety of patients by eliminating the remaining parts of the breast⁽⁴⁾. Immediate transverse rectus abdominis myocutaneous (TRAM) flap is a good choice for breast reconstruction. Its contour more resembles a normal breast than that of reconstruction with prosthesis. On the other hand, the patients experienced more extensive surgery as well as risk of surgical complications.

Moreover, adjuvant treatments after surgery, including chemotherapy, radiotherapy, and anti-hormone treatment affect QoL as well. So this study would focus on the patients who had received chemotherapy and radiotherapy not less than 6 months⁽⁸⁻¹⁰⁾ but some of these patients still receive anti-hormone treatments.

There is limited research that focused on satisfaction and QoL of the patients who underwent TM with immediate TRAM flap reconstruction (TM-TRAM), especially in Thailand. In this study, we compared QoL among female patients who underwent TM, TM-TRAM, and BCS followed by radiotherapy. The aspects of QoL were composed of physical, mental, emotional, social ways, specific symptoms of breast, and overall QoL.

Material and Method

Patients

Two hundred and sixty-five Thai women with breast cancer who underwent TM, TM-TRAM, and BCS in Siriraj Hospital from January 2003 to January 2008 participated in this study. One hundred and thirteen patients were treated by TM (TM group), 109 patients were treated by BCS (BCS group). Forty-three patients were treated by TM-TRAM (TRAM group). The patients must completely receive surgery, chemotherapy and radiotherapy for not less than 6 months. Hormonal treatment was allowed at the time of interview. Patients with age less than 18 and more than 80 were excluded from the study. The patients with metastatic disease, recurrent disease, severe medical illness or loss to follow-up were excluded.

Methods

All patients were interviewed at follow-up clinic. Patients who finished a regular follow-up process

were explained regarding how to be interviewed and the details of the questionnaires. Patients who agreed signed a research consent form. In an interview, there would be an authority that explains the questions to the patients and let the patients choose their best answers. The interview would take about 30 minutes per patient.

Functional Assessment of Cancer Therapy-General (FACT-G) total score is quality of life in general well-being that is derived by the sum of scores of physical, social, emotional and functional well-being. Score range is 0 to 108. Questionnaire interview Functional Assessment of Cancer Therapy-Breast Cancer Specific (FACT-B) was also used for analysis. It consists of questions involved in QoL in physical, social, emotional, function and breast-specific symptom aspects. Each part of QoL questionnaire was calculated to total score of 100 points. FACT-B total score is overall QoL in breast cancer patient that is derived by sum of score of physical, social, emotional, functional well-being and breast cancer subscale. Score range is 0 to 144.

Statistical analysis

Descriptive statistics were used to display demographic data of the patients. Comparisons of categorical parameters among different groups were performed using Pearson's Chi-square test or Fisher's exact test. QoL scores of each treatment group were compared by analysis of variance (ANOVA). Statistical analyses were performed using SPSS statistical software version 16. All statistics were considered to be significant if p -value < 0.05 .

Results

Characteristics of the patients

Mean follow-up time was 37.7 months. Median follow-up time was 28.5 months (range 6 to 156 months). Demographic data of the patients were summarized in Table 1. The mean age of TM, BCS and TM-TRAM group were 48.73, 46.14, and 44.49 years, respectively. The mean age of TM group was older than BCS and TM-TRAM group. There was no significant difference in terms of graduate ($p = 0.080$), marital ($p = 0.137$), occupational ($p = 0.064$), and menopausal status ($p = 0.486$) among the three groups.

For the tumor characteristics, there were differences among the three groups in pT staging and pN staging. T staging was lower in BCS and TM-TRAM group than TM group ($p = 0.028$). N staging was also lower in BCS and TM-TRAM group than in TM group

Table 1. Demographic data of the patients recruited in the study

Clinicopathological parameters	TM, n (%)	BCT, n (%)	TM-TRAM, n (%)	<i>p</i> -value
Number of patients	113	109	43	
Age				
Mean±SD	48.73±9.53	46.14±8.69	44.49±8.06	0.001
<40	8 (7.1)	15 (13.8)	4 (9.3)	0.066
41-60	89 (78.7)	86 (78.9)	37 (86.0)	
>60	16 (14.2)	8 (7.3)	2 (4.7)	
Graduate				
Below Bachelor degree	57 (50.4)	48 (44.0)	14 (32.6)	0.080
Bachelor degree or above	56 (49.6)	61 (56.0)	29 (67.4)	
Marital status				
Single	33 (29.2)	20 (18.3)	13 (30.2)	0.137
Married	74 (65.5)	79 (72.5)	29 (67.5)	
Divorced	6 (5.3)	10 (9.2)	1 (2.3)	
Menopausal status				
Pre-menopause	31 (27.4)	31 (28.4)	15 (34.9)	0.486
Post-menopause	82 (72.6)	78 (71.6)	27 (65.1)	
Occupation				
Employed	96 (85.0)	90 (82.6)	38 (88.4)	0.064
Unemployed	19 (15.0)	29 (11.4)	5 (11.6)	
T-staging				
pT1	47 (41.6)	67 (61.5)	23 (53.5)	0.028
pT2	60 (53.1)	40 (36.7)	18 (41.9)	
pT3	6 (5.3)	1 (0.9)	1 (2.3)	
pT4	0	1 (0.9)	1 (2.3)	
N-staging				
pN0	64 (56.6)	89 (81.7)	29 (67.4)	<0.001
pN1	24 (21.2)	16 (14.7)	8 (18.6)	
pN2	12 (10.6)	3 (2.8)	5 (11.6)	
pN3	13 (11.5)	1 (0.9)	1 (2.3)	
Staging				
I	37 (32.7)	60 (55.0)	16 (37.2)	0.034
II	52 (46.0)	45 (41.3)	24 (55.8)	
III	24 (21.2)	4 (3.7)	3 (7.0)	
Axillary surgery				
ALND	79 (69.9)	52 (47.7)	30 (69.8)	0.001
SLNB	34 (30.1)	57 (52.3)	13 (30.2)	
Estrogen receptor				
Positive	81 (71.7)	76 (69.7)	26 (60.5)	0.429
Negative	30 (26.5)	28 (26.7)	14 (32.5)	
Unknown	2 (1.8)	5 (4.6)	3 (7.0)	
Progesterone receptor				
Positive	74 (65.5)	72 (66.1)	21 (48.8)	0.145
Negative	37 (32.7)	31 (28.4)	19 (44.2)	
Unknown	2 (1.8)	6 (5.5)	3 (7.0)	
HER-2				
Positive	13 (11.5)	17 (15.6)	23 (53.5)	0.147
Negative	81 (71.7)	75 (68.8)	23 (53.5)	
Unknown	19 (16.8)	17 (15.6)	13 (30.2)	
Chemotherapy				
No	46 (35.4)	48 (44.0)	8 (18.6)	0.010
Yes	73 (64.6)	61 (56.0)	35 (81.4)	

Table 1. Cont.

Clinicopathological parameters	TM, n (%)	BCT, n (%)	TM-TRAM, n (%)	p-value
Radiotherapy				
No	82 (72.6)	0 (0%)	37 (86.0%)	<0.0001
Yes	31 (27.4)	109 (100%)	6 (14.0%)	
Hormonal therapy				
No	26 (23.0)	24 (22.0)	16 (37.2)	0.687
Yes	87 (77.0)	85 (78.0)	27 (62.8)	
Duration of follow up (months)				
Mean±SD	34.65±23.71	32.82±23.79	45.53±36.49	0.114
Range	6-124	7-132	7-156	

($p < 0.0001$). Stage III breast cancer was more common in TM group than BCS or TM-TRAM group. Hormonal receptor and HER2 status were not different among the three groups.

In the TM and TM-TRAM group, higher proportion of the patients underwent axillary dissection (ALND) than in BCS group (69.9%, 69.8%, and 47.7%, respectively, $p = 0.007$). Higher proportion of the patients in TM and TM-TRAM group received chemotherapy when compared to BCS group. All of the patients who underwent BCS received radiotherapy.

Comparison of QoL among the three groups

The patients who underwent TM-TRAM tended to have better QoL than the patients who underwent TM and BCS in overall QoL in general well-being, however, the level of significant was not reach. Table 2 summarized each aspect of QoL. The patients in TM-TRAM group had significant better QoL in emotional well-being ($p = 0.019$). Post Hoc analysis showed that the patients who underwent TM-TRAM had better emotional well-being than the patients who underwent BCS (86.39 vs. 80.39 points, Bonferroni Post Hoc $p = 0.036$). When we compared FACT-G score in the TM-TRAM group and BCS group, FACT-G total score in the TM-TRAM group is significantly better than in BCS group (90.81 vs. 86.16 points, Bonferroni Post Hoc $p = 0.027$).

QoL among different patient, tumor and treatment characteristics

Women with Bachelor Degrees or above had better QoL than women with below Bachelor Degree in general well-being (FACT-G) (Table 4). When analysis in each part of QoL, social well-being and functional well-being were better in women with high graduation. Physical, emotional and breast-specific well-being were

not different in either group. The patients who underwent ALND had worse QoL than those who underwent sentinel lymph node biopsy (SLNB) in general well-being (FACT-G total score). Overall QoL in breast cancer patients was (FACT-B total score) (Table 5). Women who underwent ALND had more breast specific symptom than those who underwent SLNB such as edema or tenderness of the arm, and bothering about hair loss. The patients who received chemotherapy had significantly worse emotional well-being and breast-specific symptoms than the patients who did not received (Table 6). In contrast, radiation did not affect QoL in breast cancer patients. QoL in breast cancer patient was not different in each age group, and marital status. Staging of the tumor, including T-, N- and overall staging, did not affect QoL. Women with advanced-stage breast cancer did not have significantly worse QoL when compare to women with early-stage breast cancer (data not shown).

Discussion

The current study compared different types of surgery in terms of QoL in Thai breast cancer patients. The authors found that women who underwent BCS or TM-TRAM did not show an advantage when compare to women who underwent TM in the QoL scales.

In Asian populations, the incidence of breast cancer in younger women is high⁽¹¹⁾. Cosmetic result after breast surgery is more important in younger breast cancer patients. In the early period, physicians and patients had doubt about effectiveness of BCS^(12,13). Only a few studies evaluated the patients at preoperative period. The time of evaluation varied from immediate postoperative time to 9 years after surgery and the number of patients in half of the studies were less than 50 in each arm. Meta-analysis showed that the patients who underwent BCS had improved psychological

Table 2. QoL among breast cancer patients underwent different surgical procedure

QoL	TM, n (%)	BCT, n (%)	TM-TRAM, n (%)	p-value
Physical well-being (100)				
Mean \pm SD	87.24 \pm 10.9	85.23 \pm 10.9	88.59 \pm 8.2	0.150
Range	(32.14 to 100)	(46.43 to 100)	(71.4 to 100)	
Social well-being (100)				
Mean \pm SD	77.55 \pm 17.3	74.86 \pm 17.2	77.61 \pm 18.1	0.454
Range	(20.82 to 100)	(21.49 to 100)	(28.6 to 100)	
Emotional well-being (100)				
Mean \pm SD	84.76 \pm 13.9	80.39 \pm 15.1	86.39 \pm 12.2	0.019
Range	(37.5 to 100)	(33.1 to 100)	(54.1 to 100)	
Functional well-being (100)				
Mean \pm SD	78.79 \pm 15.1	78.03 \pm 15.9	83.04 \pm 14.3	0.183
Range	(35.7 to 100)	(32.4 to 100)	(53.6 to 100)	
Breast-specific symptom (100)				
Mean \pm SD	76.45 \pm 14.6	75.07 \pm 13.6	79.83 \pm 12.7	0.258
Range	(30.6 to 100)	(38.9 to 100)	(50.0 to 100)	
FACT-G Total score (108)				
Mean \pm SD	88.73 \pm 12.1	86.16 \pm 11.7	90.81 \pm 10.2	0.056
Range	(46.8 to 100)	(48 to 100)	(67 to 100)	
FACT-B Total score (144)				
Mean \pm SD	116.52 \pm 16.2	113.75 \pm 15.9	119.09 \pm 13.7	0.275
Range	(68.8 to 144)	(71.0 to 144)	(85 to 100)	

Table 3. Comparison of QoL between two groups of the patients

QoL	All groups p-value	TM-TRAM vs. TM p-value	TM-TRAM vs. BCT p-value	BCT vs. TM p-value
Physical well-being	0.150	0.462	0.077	0.155
Social well-being	0.454	0.983	0.380	0.244
Emotional well-being	0.019	0.849	0.036	0.069
Functional well-being	0.183	0.120	0.070	0.710
Breast-specific well-being	0.258	0.173	0.105	0.707
FACT-G total score	0.056	0.331	0.027	0.088
FACT-B total score	0.275	0.360	0.060	0.182

adjustment, marital–sexual adjustment, social adjustment, body image or self-image, and cancer-related fears⁽¹⁴⁾. However, several studies compared QoL of the patients who underwent BCS and TM and found that there was no difference of QoL among BCS and TM; except for body image⁽¹⁵⁾.

TM following with reconstruction (TM-R) could be performed in the patients who have contraindication for BCS and eliminate drawbacks of BCS. There is no residual breast tissue to concern of residual tumor or recurrence and no radiotherapy is needed in the patients with tumor size \leq 5 cm, margin \geq 1

mm and node negative. Comparison of QoL in the patients with TM-R might be difficult. There were few studies that compared QoL among TM-R patients and the proportion of the patients with TM-R was limited. In addition, different questionnaires and scoring tools were employed. Reconstruction procedure in our study was exclusively TRAM; while most of the previous studies included both autologous (TRAM and latissimusdorsi flap) and prosthesis reconstruction.

Results of the current study were consistent with previous reports that demonstrated no difference between surgical treatment in terms of well-being and

Table 5. QoL among different axillary surgery

QoL	ALND, mean \pm SD	SLNB, mean \pm SD	<i>p</i> -value
Physical well-being	85.86 \pm 11.3	87.82 \pm 9.1	0.133
Social well-being	75.26 \pm 18.6	78.33 \pm 15.3	0.155
Emotional well-being	82.53 \pm 14.6	84.33 \pm 13.7	0.311
Functional well-being	77.99 \pm 16.0	80.95 \pm 14.2	0.120
Breast-specific well-being	74.65 \pm 13.9	79.88 \pm 13.3	0.002
FACT-G total score	86.91 \pm 12.3	89.76 \pm 10.7	0.050
FACT-B total score	113.84 \pm 12.1	118.84 \pm 11.9	0.007

Table 6. QoL among the patients with or without chemotherapy

QoL	No chemotherapy, mean \pm SD	Chemotherapy, mean \pm SD	<i>p</i> -value
Physical well-being	85.75 \pm 11.4	87.16 \pm 9.9	0.288
Social well-being	75.89 \pm 16.5	76.81 \pm 17.9	0.672
Emotional well-being	85.5 \pm 12.5	81.85 \pm 15.1	0.039
Functional well-being	79.76 \pm 14.4	78.78 \pm 15.9	0.611
Breast-specific well-being	78.93 \pm 13.7	75.35 \pm 13.9	0.039
FACT-G total score	88.43 \pm 10.9	87.79 \pm 12.2	0.667
FACT-B total score	116.82 \pm 11.3	115.32 \pm 11.9	0.473

Table 4. QoL among graduate status

QoL	Below Bachelor, mean \pm SD	Bachelor or above, mean \pm SD	<i>p</i> -value
Physical well-being	86.8 \pm 10.3	86.48 \pm 10.8	0.806
Social well-being	73.59 \pm 18.8	78.89 \pm 15.8	0.012
Emotional well-being	82.75 \pm 14.5	83.65 \pm 14.1	0.605
Functional well-being	75.86 \pm 15.6	81.92 \pm 14.7	0.001
Breast-specific well-being	77.0 \pm 14.5	76.45 \pm 13.5	0.745
FACT-G total score	86.33 \pm 11.8	89.46 \pm 11.5	0.028
FACT-B total score	114.13 \pm 10.9	117.21 \pm 11.2	0.231

patients' satisfaction^(10,16). The outcomes of body image and aesthetic result were controversy among studies. Some studies reported superior outcome of BCS in terms of body image and feeling attractiveness⁽¹⁷⁻¹⁹⁾. Whereas Nicholson et al reported that the patients who underwent breast reconstruction (including TRAM, latissimusdorsi flap, and implant) had better cosmetic outcome and satisfaction⁽²⁰⁾.

Pre-operative counseling including surgical option and reassurance of the effectiveness of each option is important. In the current study, BCS patients did not have better QoL comparing to TM patients. This might be due to concern of residual disease or recurrence in the remaining breast tissue. Other factors are availability

of radiotherapy and concern of side effect of radiation. Ratio of tumor size to breast size and location of the tumor also affect cosmetic outcome. Asymmetric breast size and form after BCS in small breast might affect body image and satisfaction. Appropriate selection of the patient for BCS or TM-R might improve cosmetic outcome and body image.

Conclusion

We reported no advantage of BCT or TM-TRAM over TM among breast cancer patients in terms of overall and breast cancer specific QoL. However, selection of surgical procedure should be based on primary tumor characteristics, size and contour of

the breasts. Counseling for surgical option and letting the patient participate in decision-making might improve emotional well-being and satisfaction.

What is already known on this topic?

Several factors contribute to QoL of breast cancer patients. The effects of surgical treatment on QoL are still controversial.

What this study adds?

QoL of breast cancer patients depend on patient's background over the type of surgery.

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Potential conflicts of interest

None.

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คุณภาพชีวิตของผู้ป่วยมะเร็งเต้านม: เปรียบเทียบในกลุ่มผู้ป่วยที่ได้รับการผ่าตัดแบบอนุรักษ์เต้านม การผ่าตัดเต้านมออกทั้งเต้าและการผ่าตัดเต้านมออกทั้งเต้าตามด้วยการสร้างเต้านม โดยใช้กล้ามเนื้อหน้าท้อง

สาริต ศรีมันทยาเมศ, ดุลยพัฒน์ สงวนรักษา, วิษณุ โล่ห์สิริวัฒน์, ปรมภรณ์ ปราสาททองโอสถ, วราภรณ์ อิมฤทัยเจริญโชค, ประดิษฐ์ รัชตามุขยพันธ์, สืบวงศ์ อูชาภิสิตธิ, กริช โพธิ์สุวรรณ, ศุภกร โรจนนรินทร์, อุดุลย์ รัตนวิจิตรศิลป์, พรชัย โอเจริญรัตน์

ภูมิหลัง: การผ่าตัดเพื่อรักษามะเร็งเต้านมระยะเริ่มต้นโดยการผ่าตัดเต้านมออกทั้งเต้า ผ่าตัดเต้านมออกทั้งเต้า ตามด้วยการสร้างเต้านมโดยใช้กล้ามเนื้อหน้าท้อง หรือการผ่าตัดแบบอนุรักษ์เต้านมให้ผลของการรักษาที่เท่าเทียมกัน ดังนั้นการเลือกชนิดของการผ่าตัดจะต้องพิจารณาถึงคุณภาพชีวิตหลังการรักษาสำหรับผู้ป่วยแต่ละราย หลายการศึกษายังไม่ให้ผลที่ยังไม่เป็นข้อสรุป

วัตถุประสงค์: เพื่อศึกษาผลของการผ่าตัดแต่ละประเภทต่อคุณภาพชีวิตของผู้ป่วยมะเร็งเต้านมชาวไทยในระยะยาว

วัสดุและวิธีการ: ผู้ป่วยที่ได้รับการรักษาโดยการผ่าตัดจำนวน 265 ราย ได้รับการประเมินคุณภาพชีวิตในช่วงเวลาอย่างน้อย 6 เดือน ภายหลังจากได้รับการรักษาเสร็จสิ้นโดยใช้แบบประเมิน FACT-G และ FACT-B

ผลการศึกษา: ผู้ป่วยที่ได้รับการผ่าตัดแบบอนุรักษ์เต้านมมีส่วนของมะเร็งระยะเริ่มแรกมากกว่าและได้รับการผ่าตัดและต่อน้ำเหลืองรักแร้เป็นสัดส่วนน้อยกว่าผู้ป่วยอีกสองกลุ่ม เมื่อติดตามเป็นระยะเวลานานพบว่าผู้ป่วยทั้งสามกลุ่มมีคุณภาพชีวิตที่ดีโดยมีคะแนนมากกว่า 80 ในเชิงสรีรวิทยาและทางด้านอารมณ์ และไม่มีมีความแตกต่างอย่างมีนัยสำคัญระหว่างทั้งสามกลุ่ม

สรุป: การเลือกประเภทของการผ่าตัดควรพิจารณาปัจจัยทางด้านตัวโรคและความเหมาะสมสำหรับผู้ป่วยแต่ละรายเพื่อให้ได้ผลสูงสุดทั้งในด้านการรักษาและคุณภาพชีวิต
