

RESEARCH ARTICLE

Cosmetic Outcomes and Quality of Life in Thai Women Post Breast Conserving Therapy for Breast Cancer

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Abstract

Purpose: To evaluate the correlation between cosmetic outcome (CO), body image, and quality of life in post breast-conserving therapy (BCT) women. **Materials and Methods:** This cross-sectional study concerned one-year post-completed BCT Thai women. The data included subjective and objective CO with a questionnaire covering demographic and clinical data, anti-hormonal treatment status, Eastern Cooperative Oncology Group (ECOG) performance status, Self-Reported Cosmetic Outcomes (SRCO), Self-Reported Breast Symmetry (SRBS), Body Image Scale (BIS), and the Functional Assessment of Cancer Therapy with Breast Cancer subscale (FACT-B). Participants had breast photographs taken for the evaluation of objective cosmetic outcome (OCO) after breast cancer conservation treatment. The relationship between CO and FACT-B was tested using Spearman's rank correlation. **Results:** A total 127 participants volunteered for the study. The participant characteristics were age 52(±9), Buddhist 87%, married 65%, body mass index 25.0(±4.6), breast cup size A-C 91%, college educated 60%, employed 66%, ECOG 0-1 95%, tumor size less than or equal to 2 cm 55%, no lymph node metastasis 98%, and taking tamoxifen 57%. Two percent of the participants regretted their decision to undergo BCT. The SRCO was excellent in 2%, good in 68%, fair in 30%, and poor in 0%. For SRBS, rates were 17%, 58%, 24% and 1% for excellent, good, fair and poor cosmetic outcomes, respectively. The BCCT scores were excellent 24%, good 39%, fair 32%, and poor 6%. The median total QOL score of the participants was 130 (93-144). There was no significant correlation between CO and FACT-B scores. **Conclusions:** The significance of CO for FACT-B in Thai women with breast cancer could not be assessed in detail because of a very low level of correlation. The results may be due to the effects of cultural background.

Keywords: Breast cancer - cosmetic outcome - breast-conserving therapy - quality of life

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Introduction

Breast-conservative therapy (BCT) is a local treatment option for breast cancer, equivalent to modified radical mastectomy in terms of overall survival. The treatment comprises wide local excision, axillary management, and postoperative radiotherapy. The BCT is not success in the only Western country. The Asian country such as China which performed oncoplastic breast conserving surgery with nipple-areolar preservation and the latissimus dorsi flap is also comparable (Ren et al., 2014). The 10-year risk of any initial recurrence (loco-regional or distant) is 19.3% and the 15-yr breast cancer mortality rate is 21.4% (Veronesi et al., 2002; Darby et al., 2011). However, the aim of breast-conserving treatment is not only disease control, esthetic results, and body image. Quality of life (QOL) is no less important.

Breast esthetics is a concern in BCT. However, the measurement of the breast cosmetic outcomes varies and

is categorized into subjective and objective evaluations. For example, the subjective evaluations are self-evaluation and observation using the Harvard scale. The objective evaluations are Breast Retraction Assessment (BRA), Breast Symmetry Index (BSI), and Breast Cancer Conservation Treatment. cosmetic results (BCCT.core) (Cardoso et al., 2012). The excellent or good cosmetic outcomes are reported 50% to 90% of the time (Arenas et al., 2006; Heil et al., 2011b; Exner et al., 2012; Nozaki et al., 2012; Hau et al., 2013). The result of a subjective evaluation depends on the observer's experience (Cardoso et al., 2005). Patient and doctor perceptions are often different. Normally patients rate the treatment outcome better than doctors (Toledano et al., 2007; Heil et al., 2011b). The major problem of subjective evaluation is less reproducibility when compared with objective cosmetic outcomes (OCO).

Pezner et al. (1985) introduced BRA for measuring breast asymmetry in 1985. Then European researchers

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developed computer software for evaluating OCO. The Breast Analyzing Tool (BAT) was developed for measuring the difference between left and right breast size using the patient's digital image. BAT calculates the BSI and derives a percentage difference (Fitzal et al., 2007). Another tool, the BCCT.core, was developed for automatic esthetic analysis based on a multiple of factors: such as breast asymmetry, color, and scar visibility features. A correct classification rate of around 70% is obtained when compared with a consensus evaluation by an expert panel (Cardoso and Cardoso, 2007).

Quality of Life (QOL) is the differentiation between expectations and experience. Breast cancer patients must deal with suffering from diagnosis to life after treatment. The dimensions of each patient's life are different. The health-related QOL questionnaires are introduced to measure common concerns. For the breast cancer patients, the Functional Assessment of Chronic Illness Therapy with Breast subscale (FACT-B) and the European Organization for Research and Treatment of Cancer Quality of Life Questionnaire (EORTC QLQ-C30), with breast cancer module (BR23), and Satisfaction with Life Domains Scale for Breast Cancer (SLDS-BC) have been used to evaluate breast cancer specific quality of life (Kanas et al., 2012). There are many factors involved in breast cancer quality of life, such as age, marital status, body mass index, educational level, income, stage of disease, distance to treatment center and treatment (Hopwood et al., 2007; Munshi et al., 2010; Al-Naggar et al., 2011; He et al., 2012; Shen et al., 2012; Takei et al., 2012; Chang et al., 2014). However, in the BCT group, there are few data investigation factors that correlate with QOL.

The cosmetic result is the promising factor influencing QOL in women with Post BCT breast cancer. The subjective cosmetic outcome affected QOL. The patients with pronounced asymmetry after BCT have more fear of recurrence, more depressive symptoms, and a worse quality of life, but they do not experience a loss of femininity (Waljee et al., 2008). For the objective cosmetic outcomes, only the objective breast symmetry did not correlate with QOL (Krishnan et al., 2001; Exner et al., 2012). But the BCCT.core is computer software, and includes more than breast symmetry for analyzing OCO. Compared with BAT software, the agreement between objective and subjective evaluations is more common with the BCCT.core. The BCCT.core is also in agreement with the breast cancer treatment outcome scale (BCTOS), which has a correlation with QOL (Cardoso et al., 2009; Heil et al., 2011a; Heil et al., 2011b). Thus, we hypothesized that BCO, when evaluated using BCCT.core, should correlate with QOL.

Materials and Methods

Population

All of the one-year post-completed BCT patients who visited Songklanagarind Hospital between April 2014 and October 2014 were invited to participate in the study. The inclusion criteria were age more than 18 years and the ability to understand the Thai language. Patients were excluded if they had any of the following

conditions: bilateral breast cancer, recurrent cancer or distance metastasis, other cancers, impaired cognition, a diagnosis of overt psychosis, major depression or delirium.

Sample size

The sample size was calculated for correlation in one sample for differentiation between 0 (no correlation) and 0.3 (poor correlation) with a significance level of 0.05 and power 0.9. The estimated sample size was 124 cases.

Study design

All of the participants were interviewed by female research assistants. Interviews took 20-30 minutes per

Table 1. Demographic and Clinical Characteristics of the Participants (n=127)

Characteristics	n (%)
Age (year)(mean(SD))	51.9 (8.9)
Buddhist	111 (87.4)
Marital status	
Single	25 (19.7)
Married	82 (64.6)
Divorced	20 (15.8)
Post-menopausal status	105 (82.7)
Body mass index (mean(SD))	24.97 (4.6)
Breast cup (Bra size)	
A	25 (19.7)
B	56 (44.1)
C	35 (27.6)
D&E	11 (8.7)
Educational level	
At least university	66 (52.0)
Secondary school	29 (22.8)
Primary and below	32 (25.2)
Disease status	
Axillary management	
No	4 (3.2)
Axillary lymph node dissection	88 (69.3)
Sentinel lymph node dissection	35 (27.6)
Stage	
T stage	
Tis	7 (5.5)
>2cm	77 (60.6)
>2cm.	50 (39.4)
N stage	
N0	98 (77.2)
N1	23 (18.1)
N2	6 (4.7)
Received neoadjuvant chemotherapy	11 (8.7)
Received adjuvant chemotherapy	101 (79.5)
Anti-hormonal therapy	
No	44 (34.7)
Tamoxifen	73 (57.5)
Aromatase inhibitor	10 (7.9)

*Abbreviation: Tis, in situ cancer

Table 2. The Correlation Coefficients between Cosmetic Outcome and Quality of Life in Each Domain

	PWB	SWB	EWB	FWB	BCS	Total
SRCO	-0.13	-0.05	-0.07	-0.18*	-0.12	-0.14
SRBS	-0.12	0.17	0.03	0.01	0.04	0.04
OCO	-0.1	0.03	0	-0.04	0.01	-0.02

*P<0.05; Abbreviation: PWB, Physical Well-being; SWB, Social Well-being; EWB, Emotional Well-being; FWB, Functional Well-being; BCS, Breast cancer subscale; SRCO, Self-rated Cosmetic Outcome; SRBS, Self-rated Breast Symmetry; OCO, Objective Cosmetic Outcome

Table 3. Comparison of Quality of Life Scores (mean (SD)) in the Studies with Breast Conserving Therapy

	PWB	SWB	EWB	FWB	BCS	Total
Japanese study (Ohsumi et al., 2009)	23.5 (2.1)	21.1 (8.7)	20.0 (3.0)	22.1 (5.2)	25.6 (4.4)	115.4 (14.5)
Chinese study (He et al., 2012)	22.0 (4.0)	22.0 (4.0)	18.0 (4.0)	18.6 (6.6)	23.0 (4.0)	104.0 (15.0)
American study a (Beaulac et al., 2002)	26.0 (0.3)	24.6 (0.5)	20.6 (0.3)	24.4 (0.4)	27.2 (0.5)	122.7 (1.4)
This study	25.2 (2.7)	25.5 (3.0)	22.1 (2.4)	26.3 (2.5)	28.0 (4.4)	127.1 (11.2)

*Abbreviation: SD, Standard deviation; PWB, Physical Well-being; SWB, Social Well-being; EWB, Emotional Well-being; FWB, Functional Well-being; BCS, Breast cancer subscale

case. After the interviews, the female researcher or research assistants took breast photographs in a separate room. Markers were placed on the sternal notch and 25 centimeters below this point. The photographs were taken from the anterior-posterior view in the same position, from the patient's neck to her umbilicus. Finally, using BCCT core software, the digital photographs were evaluated for objective cosmetic outcome. The Ethics Committee of the Faculty of Medicine, Prince of Songkla University approved this study (EC: 56-456-07-1).

Instruments

The questionnaire comprised four parts. Researchers or research assistants answered the first part, which included general patient characteristics and treatment status. In parts 2 to 4, participants were asked their opinions on the importance of BCT, Self-rated Cosmetic Outcome (SRCO), Self-rated Breast Symmetry (SRBS) using Harvard's scale, satisfaction with BCT and the Functional Assessment of Cancer Therapy-Breast (FACT-B).

A scale from 1 (very important) to 4 (not important) was used to rate patient opinion on the importance of BCT. The SRCO scale is 1 (excellent result) to 4 (poor result). The SRBS is categorized into four levels: 1 (treated breast nearly identical to untreated breast), 2 (treated breast slightly different than untreated), 3 (treated breast clearly different than the untreated breast but not seriously distorted) and 4 (treated breast seriously distorted) (Cardoso et al., 2012). Participant satisfaction with BCT was a yes/no question.

The FACT-B evaluated five aspects: Physical Well-being (PWB), Social Well-being (SWB), Emotional Well-being (EWB), Functional Well-being (FWB), and the Breast Cancer Subscale (BCS). The scoring range was 0-144. A higher score represents a better QOL (Brady et al., 1997).

Objective cosmetic measurement

In a separate room, a CANON EOS 50D with adequate image resolution was used to take the photo for determining the cosmetic outcome. The room was lit from both sides and in front of the participant in order to reduce any shadow. The camera-to-patient distance was 1.5 meters from the wall. In the objective cosmetic analysis process, the BCCT core software was displayed with the same monitor resolution. The same medical professional operated the objective cosmetic evaluation tool. The OCO was interpreted as excellent, good, fair or poor.

Statistical analysis

Participant characteristics, opinion of importance of BCT, SRCO, SRBS, and satisfaction with BCT and

FACT-B were all evaluated using descriptive statistical analysis. Spearman's correlation was used for evaluating the correlation between cosmetic outcome and QOL. Statistical analysis was conducted using the R program.

Results

During a six-month period a total of 127 one-year post-BCT patients volunteered to participate in this study. The characteristics were age (52(±9)), Buddhist (87%), married (65%), body mass index (25.0(±4.6)), breast cup size A-C (91%), university educated (60%), employed (66%), ECOG 0-1 (95%), T1 (55%), N0 (98%), and taking tamoxifen (57%). Characteristics and clinical data are shown in Table 1.

Of the participants, 69% were concerned about their breast cosmetics. However, only 2% of the participants regretted BCT. The SRCO was excellent 2%, good 68%, fair 30%, and none of the 127 participants rated their cosmetic outcome as poor. For SRBS: 17%, 58%, 24% and 1% for excellent, good, fair and poor cosmetic outcomes, respectively. The BCCT core reported excellent 24%, good 39%, fair 32%, and poor 6%. Cosmetic outcomes are distributed by regulation.

The median total QOL score of the participants was 130(93-144). The median PWB, SWB, EWB, FWB and BCS scores were 26(16-28), 26(16-28), 23(12-24), 27(14-36) and 29(17-36), respectively.

Correlation between cosmetic outcome and quality of life

There was no significant correlation between the level of cosmetic outcome and total quality of life score. The levels of significance were -0.02 (p=0.80), 0.04(p=0.66) and 0.14(p=0.11) for OCO, SRBS and SRCO, respectively. Only SRCO was correlated with FWB, with a level of correlation of 0.18(p=0.04). The correlation between cosmetic outcome and other aspects of QOL are shown in Table 2. The correlation was poor to no correlation without statistical significance.

Discussion

It is possible for breast cancer patients to live long and full lives. Thus, esthetic outcome and quality of life are important. However, the relationships between these results remain unclear. A large survey study was conducted; it included 714 participants. This study determined patient-breast cosmetic outcome ratings using 8-items for cosmetic evaluation from BCTOS. Then it categorized scores into three groups: minimal asymmetry, moderate asymmetry, and pronounced asymmetry. The participants with pronounced asymmetry fared poorly

in many aspects, such as fear of disease recurrence and depressive symptoms. QOL is also involved. They used patient-rated QOL (scale 0 to 100). The QOL score is 86.3, 86.0 and 84.2 for minimal asymmetry, moderate asymmetry, and pronounced asymmetry, respectively (Waljee et al., 2008). However, the 1.8-score change is hard to translate into a minimal clinically important difference.

Concerning objective cosmetic outcome, the secondary data analysis included 54 participants with an average age of 65 years. The objective cosmetic outcome measured breast size difference, breast symmetry, breast fibrosis, and telangiectasia. These 4 scales were summed and translated to the Cosmetic Index (CI). The correlation coefficients between level of CI and SF-36 were -0.13 and -0.03 for mental and physical health, without statistical significance (Krishnan et al., 2001). The prospective study, which included 101 participants, was conducted using computer aided breast symmetry measurements. The results showed no significant correlation between the BSI and the BR23. The study concluded that breast symmetry is not a major factor in patient QOL. The cosmetic outcome seems to be less important in the BCT (Exner et al., 2012).

In previous studies, the BCCT.core software had moderate to substantial agreement with health care providers and fair agreement with BCTOS esthetic status (Cardoso et al., 2009; Heil et al., 2011b). However, the prospective study included 531 BCT patients and mastectomy with immediate reconstruction patients, using BCCT.core, EORTC QLQ-C30, and BR23. No association between general QOL and objective cosmetic outcome was found (Kim et al., 2015). In this study, there is no significant correlation between the level of objective cosmetic outcome and FACT-B. Moreover, the subjective cosmetic outcome has no correlation with FACT-B. We calculated the power of the test for determining errors in the result. The power of the test was 80%, 69%, and 50% for the objective cosmetic outcome, SRBS, and SRCO. Thus we would need a total of 2,800 participants to reach a power of the test of 90%. On the other hand, if the 20% chance to error occurred. The relationship between cosmetic outcome and QOL is still very poor. If we are going to improve the QOL of women with breast cancer other methods should be considered.

There are two possibilities in which a false negative result could occur. First, the participants had high FACT-B scores, 87.4% of whom are Buddhist. Thailand has high collectivism score and high femininity score by cultural tool of the Hofstede Centre. In a collectivist society, people are born into extended families, the harmony of which should always be maintained, and displays of sadness are encouraged. In a femininity society, relationships and quality of life are important, both men and women can be tender and focus on relationships, and the sexual harassment is a minor issue (Hofstede et al., 2010). Thus women with breast cancer tend to receive tender support from their husbands, friends, and family. The Maha Mangala Sutta contains a discourse of the Buddha on the subject of blessings. Contentment is one of the thirty-eight blessings that can relieve suffering. Contentment is defined as the acceptance of conditions and situations

as they arise, with equanimity and without grumbling (Soni, 1978). If QOL is the gap between expectation and experience, contentment will reduce the gap by reducing the expectations in life, allowing women with breast cancer peace of mind. The result of cultural background shows a higher FACT-B score in Thai women with breast cancer on SWB, EWB and FWB (Table 3). Second, the cosmetic outcome of this study is comparable with others, although Thai women do not have large breasts (63.8% Bra Size A and B). The demographic data showed 74.8% of participants had a moderate or high education. The awareness of breast cancer and women's education will bring them present to the hospital by the small tumor. Healthcare providers could recommend BCT to women with breast cancer. Therefore, the OCO in this study is not much different from the other studies (Krishnan et al., 2001; Heil et al., 2011b; Exner et al., 2012). Due to the poor distribution of the data, we could not achieve statistical significance.

The QOL measurement tools are factors that could have contributed to the negative results in this study. The QLQ-C30 is a cancer-specific QOL questionnaire, which includes nine domains: physical, role, cognitive, emotional, social, fatigue, pain, nausea, and vomiting. The BR23 is the module, which covers body image, sexuality, arm symptoms, and systemic therapy side effects (Aronson et al., 1993; Sprangers et al., 1996). The FACT-B is a 44-item cancer-specific QOL that comprises PWB, SWB, EWB, FWB, satisfaction with the doctor, and BCS (Brady et al., 1997). The SLDS-BC is the 32-item, 7-point Likert's scale, including five domains: social functioning, appearance, physical functioning, communication with physical providers and spirituality (Spagnola et al., 2003). Much in evidence, there is no domain related to the symmetry of the breast and specific to the cosmesis in the general cancer-specific questionnaires.

The BCTOS and BREAST-Q are instruments for cosmetic and reconstructive breast surgery. The BCTOS includes three domains: functional status, cosmetic status, and breast-specific pain. The cosmetic status comprises breast size, breast texture, nipple appearance, breast shape, breast elevation, scar tissue, fit of bra, and fit of clothing. Although the BCTOS includes cosmetic status, the level of correlation with SF-36 physical health is still very low (Stanton et al., 2001). The BCTOS has not been developed in the Thai language. The BREAST-Q is a new instrument designed to evaluate outcomes in women who have undergone different types of breast surgery. The BREAST-Q evaluates both the QOL domain and satisfaction domain; it has modules for different situations, such as Augmentation, Reduction/Mastopexy, Mastectomy, and Reconstruction. But the Breast Conserving Therapy module is underdeveloped (Cano et al., 2013). Thus, we could only use the generic cancer-specific questionnaires in the study. The FACT-B was translated into the Thai language and it determined the psychometric properties. FACT-B and EORTC QLQ-C30 with BR23 were compared for validity and reliability. The construct validity of factor analysis determined both of the instruments. The results showed that both instruments

were conceptually cross-cultural equivalents for Thai women with breast cancer undergoing treatment. The reliability of internal consistency for a week to a month after the completion of treatment showed both instruments had a good criterion (Glangkarn et al., 2011). We chose FACT-B in the study because it was developed with an emphasis on patient values and brevity. Thus, the negative results show that only CO had no correlation with the domain in the questionnaire. The value of CO in other dimensions of women's lives has not been evaluated yet.

Limitations: This study included only Thai BCT patients. Although the OCO are comparable, the QOL data are different due to cultural background. The age of the participant is also important. Secondly, this study included breast cancer patients whose average age was 52 years old. If we included younger women, the results would be more promising. Thus, generalizations should be careful.

In conclusion, the results may be interpreted in two ways. First, breast cancer centers should consider the appropriate procedures for improving the QOL of Thai BCT patients, especially concerning cosmetic outcomes. Second, there is a lot of uncertainty surrounding the values of OCO. The level of cosmetic outcome is important; however, the meaning has not yet been evaluated by the generic cancer-specific QOL instruments. Thus, we must determine the true values in order to establish good indicators for the improvement of our patients' lives.

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