# Clinical and quality of life outcomes following reduction mammoplasty for symptomatic macromastia among Sri Lankan women: A prospective observational study



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Submission: 30-05-2023 Revision: 29-09-2023 Publication: 01-11-2023

# ABSTRACT

Background: The impact of macromastia is unfortunately underestimated among developing South Asian countries. However, it remains a common cause of physical and emotional suffering among women. Aims and Objectives: We aimed to evaluate the efficacy of reduction mammoplasty in alleviating symptoms of macromastia and its impact on quality of life (QOL) among Sri Lanka females. Materials and Methods: A prospective study was conducted among 48 patients who underwent reduction mammoplasty in a surgical unit in Sri Lanka. SF-36 questionnaire and a Visual Analog Scale were used to assess QOL and pain. The outcomes were assessed 1 week prior and at 2 weeks and 6 months after surgery. Results: Median age was 43 years and the median body mass index was 26.8 kg/m<sup>2</sup>. The average duration of symptoms was 2 years. All patients initially were reluctant to seek medical advice. Only 10.4% of patients were aware of the availability of treatment. Wisepattern reduction mammoplasty was performed in 79.2%. There was a significant reduction in pain following surgery. There was also an improvement in all domains of the QOL following surgery, especially in general health, pain, and physical functions. Conclusion: Reduction of mammoplasty caused a significant improvement in the overall QOL with the reduction in pain for patients suffering from macromastia. Creating more awareness among the public to encourage women to discuss breast-related symptoms and to overcome sociocultural taboos is a timely necessity.

**Key words:** Quality of life; Clinical outcomes; Reduction mammoplasty; Symptomatic macromastia; Sri Lanka

#### Access this article online

#### Website:

http://nepjol.info/index.php/AJMS **DOI:** 10.3126/ajms.v14i11.53991

E-ISSN: 2091-0576 P-ISSN: 2467-9100

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# INTRODUCTION

Macromastia is a term used to describe enlarged heavy breasts.<sup>1</sup> Macromastia may be caused by glandular hypertrophy, excessive fatty tissue or a combination of both causing an increase in volume and weight of breast tissue beyond normal proportions.<sup>1,2</sup> Although the exact pathophysiology of breast hypertrophy or macromastia is

unknown, the condition is believed to be the product of abnormal end-organ response to estrogen.<sup>1,2</sup>

The impact of macromastia is unfortunately underestimated among the developing South Asian countries. However, it remains a common cause of physical and emotional suffering among women around the developed world and its negative impacts have been well documented.<sup>3,4</sup>

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Macromastia is associated with severe pain in the breast, back, neck, and shoulders. Patients also frequently report painful grooving due to brassiere straps, sub-mammary fold intertrigo, and difficulty in finding properly fitted clothing.<sup>3</sup> Furthermore, problems with body image perception, reduced quality of life (QOL), and overall decline in physical activity are also common.<sup>3,4</sup>

Many studies have established the association between macromastia and impaired mental and physical health in adult females.<sup>3-5</sup> Reduction mammoplasty is recognized as an effective treatment to relieve these physical and psychological distress caused by macromastia.<sup>4</sup> The surgical procedure involves a volumetric reduction of breast tissue mass and to redesign the breast with an esthetically acceptable appearance.<sup>6,7</sup>

The earliest recorded procedures of reduction mammoplasty by reconstructive and aesthetic surgeons have been described in the last two decades of the 19<sup>th</sup> century.<sup>8</sup> At present, a wide range of surgical techniques are available to perform a reduction mammoplasty.<sup>8,9</sup>

The impact of macromastia in Sri Lanka is unknown. Sri Lanka is situated in the Indian subcontinent and the sociocultural aspects differ considerably from the Western world and developed Asian countries where most related studies are from.<sup>10</sup> In Sri Lanka, due to the sociocultural issues, problems regarding breasts are considered taboo and not widely discussed. 11,12 Thus, females in Sri Lanka are generally reluctant to speak out and seek treatment due to social and cultural constraints. To address this, reduction mammoplasty for patients affected by symptomatic macromastia was introduced in our tertiary care referral center with a special interest in breast surgery. The effectiveness and outcomes of reduction mammoplasty for macromastia in Sri Lanka have not been studied and warrant evaluation due to the differences in the sociocultural aspects compared to the Western world. Therefore, we aimed to evaluate the efficacy of reduction mammoplasty in alleviating symptoms of macromastia and its impact on QOL among Sri Lanka females.

#### Aims and objectives

This study was aimed to evaluate the efficacy of reduction mammoplasty in alleviating symptoms of macromastia and its effect on quality of life among Sri Lankan women.

# MATERIALS AND METHODS

# Study design

A prospective study was carried out in a tertiary care surgical unit at the National Hospital of Sri Lanka, Colombo from 2016 January to 2021 January.

#### Study population

This study included all females aged over 18 years, who underwent reduction mammoplasty for symptomatic macromastia during the study period. All patients gave informed written consent before participating in this study. Patients were recruited while awaiting surgery and data were obtained during a one-on-one clinical interview after obtaining informed written consent. The follow-up assessments were conducted during clinic appointments and telephone conversations. All patients who underwent reduction mammoplasty for symptomatic macromastia with adequate follow-up were included in the final analysis.

All patients with symptomatic macromastia presenting to the clinic were initially assessed with both ultrasound and mammogram of both breasts, to exclude an underlying malignancy. All patients with normal or benign breast disease on imaging were offered reduction mammoplasty.

Two standard reduction mammoplasty procedures were carried out in our study group:

- 1. Wise pattern reduction mammoplasty with superomedial or inferior pedicle
- 2. Le jour-vertical reduction mammoplasty.

All surgical procedures were carried out by the same senior consultant-led team to ensure uniformity in procedures.

#### **Variables**

The following data collection tools were utilized. An interviewer-administered questionnaire was used to collect socio-demographic and clinical data. SF-36 questionnaire which is validated in Sri Lanka was used to assess the QOL.<sup>13</sup> The SF-36 measures health-related QOL in 8 domains; namely, general health, physical functioning, role limitations due to physical health, bodily pain, emotional well-being, role limitations due to emotional problems, vitality (energy/vitality), and social functioning. Domain scores were transformed to a scale of 0–100, with higher SF-36 domain scores associated with better health-related OOL.<sup>14</sup>

To assess pain related to macromastia, a Visual Analog Scale was used from 0 to 10 according to the level of intensity. Zero indicated the absence of pain and 10 represented the most intense pain possible. These outcomes were assessed 1 week before surgery and at 2 weeks and 6 months after surgery.

#### **Ethics**

Ethics approval was obtained from the Ethics Review Committee of the National Hospital of Sri Lanka and the study protocol was approved by the above institution. All methods were carried out in accordance with guidelines and regulations.

#### Statistical analyses

Statistical tests were performed using a Statistical Package for Social Sciences statistical software. Baseline characteristics were reported as absolute numbers and percentages for categorical variables and median and range for continuous variables. Continuous variables were also compared using non-parametric tests. The difference between the two paired means was analyzed using Wilcoxon rank test. Statistical significance was assumed for P<0.05.

# **RESULTS**

During the study period, 55 patients underwent reduction mammoplasty. Seven patients were excluded due to inadequate follow-up data and 48 patients were included in the final analysis.

The median age was 43 (range: 40–57) years. The median body mass index (BMI) was 26.8 (range: 25.2–32.1) kg/m² with 93.7% of patients being overweight (BMI  $\geq$ 25 kg/m²) and the rest were obese (BMI  $\geq$ 30 kg/m²) according to the WHO categorization of BMI.

All patients presented with breast pain and musculoskeletal pain, while 81.3% (n=39) had evidence of painful shoulder grooving and 37.5% (n=18) had submammary intertrigo. The patients in our study group have been suffering from symptomatic macromastia for an average of 2 years. All the patients were initially reluctant to seek medical advice. The two main reasons behind the reluctance were being unaware of the clinical diagnosis of macromastia and the sociocultural restraint. Around 89.6% (n=43) of patients were also unaware of the availability of surgical management as an option to treat symptomatic macromastia. Around 29.2% (n=14) feared of being offered bilateral mastectomy for delay in presentation (Table 1).

Wise pattern reduction mammoplasty was performed among 79.2% of patients. Of which, the majority (76.3%, 29/38) had an inferior-based pedicle. The median resection weight of both breasts per patient was 1.27 (range: 1.0–1.63) kg. The median stay at the hospital was 3 days (range: 3–5 days) (Figures 1 and 2).

The commonest complication following therapeutic mammoplasty was wound dehiscence (8.3%; n=4/48) followed by superficial surgical site infection (4.2%; N=2/48). One patient had complete nipple necrosis.

The mean pre-operative pain score due to macromastia was 9.54 which reduced to 1.75 at 2 weeks following surgery (P<0.001). The improvement in pain score remained significant at 6 months with a mean score of 1.67. The mean score on satisfaction with the breast aesthetics (size and shape) was 1.48 before surgery and was significantly improved at both 2 weeks (9.41; P<0.001) and 6 months (9.43; P<0.001) after surgery (Figure 3). There was an improvement in all 8 domains of the QOL following reduction mammoplasty in comparison to the pre-operative scores, especially in general health, pain, and physical functions (Table 2).

#### DISCUSSION

Our study examined the reasons for the delayed presentation of macromastia and the efficacy of reduction mammoplasty in alleviating the physical and emotional symptoms as well as its effect on the QOL among 48 Sri Lankan females with symptomatic macromastia. Our study showed that women from Sri Lanka suffered from significant physical and psychological distress due to macromastia similar to existing literature.<sup>15</sup>

Study variable	N (n=48)	Percentage	
Median age (range)	43 (40–57) years		
Median BMI (range)	26.8 (25.2–32.1) kg/m <sup>2</sup>		
Patients who were employed	42	87.5	
Patients with prior awareness of availability of	5	10.4	
treatment			
Symptoms			
Breast pain	48	100	
Back/shoulder/neck pain	48	100	
Shoulder grooving	39	81.3	
Intertrigo	18	37.5	
Type of reduction mammoplasty			
Wise pattern with inferior pedicle	29	60.4	
Wise pattern with superomedial pedicle	9	18.8	
Le jour vertical mammoplasty	10	20.8	
Median resection weight (range)	1.27 (1.0–1.63) kg		
Median hospital stay (range)	3 (3–5) days		

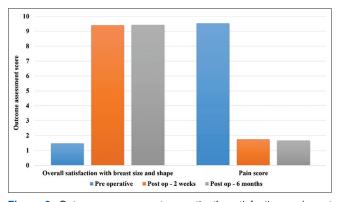
The most common presentation was breast and musculoskeletal pain which was present in all patients for an average of 2 years. A majority of the patients attributed the pain to macromastia but were reluctant to seek medical advice or openly discuss with medical professionals regarding their suffering. This was mainly due to a lack of knowledge about the clinical diagnosis of macromastia as a



Figure 1: Wise pattern reduction mammoplasty: on left, pre-operative and on right, post-operative day 7



Figure 2: Le jour vertical reduction mammoplasty: on left, pre-operative and on right, post-operative day 7



**Figure 3:** Outcome assessment on patient's satisfaction on breast aesthetics and effect on pain - pre operative, at post-operative 2 weeks and 6 months

treatable condition and also the inherent cultural restraints of discussing breast-related symptoms. This in addition highlights the importance of considering symptomatic macromastia in the differential diagnosis of patients presenting with chronic neck and back pain, especially in a background where the females would be reluctant to come out with breast-related symptoms.

The study population mainly consisted of middle-aged females who were suffering from severe pain due to macromastia whilst contributing to the family finances despite suffering from the symptoms. This also highlights the silent suffering of the women mainly due to communication barriers as well as the lack of knowledge regarding the treatment available for macromastia. This was clearly seen in our study as 89.6% of these patients were unaware of the availability of treatment for macromastia before our clinic visit. The inadequacy of knowledge makes it clear that this is indeed a problem that needs to be discussed among these patients. Furthermore, education of the health care providers may be an effective strategy to identify patients with symptomatic macromastia and direct them along suitable clinical pathways.

All patients in the study were noted to be either overweight or obese. Although a correlation between BMI and macromastia is not well established, an association between the two have been noticed in similar studies. <sup>16,17</sup> Increased BMI is a known factor that contributes towards increased post-operative surgical complications such as wound dehiscence and infection. <sup>18,19</sup>

A majority of patients were offered Wise pattern reduction mammoplasty. The type of surgery and the pedicle was planned by the consultant surgeon taking into consideration the technical aspects such as breast volume and ptosis, the pattern of the skin, final location of scar, the anatomy of the main pedicle as well as the surgeon's preference. Moreover, existing data regarding surgical techniques for therapeutic mammoplasty demonstrate the differing strengths and weaknesses of each technique but have not confirmed the superiority of one over the other.<sup>20,21</sup>

It is interesting to note that all four patients who had wound dehiscence were patients who underwent wise pattern mammoplasty with inferior pedicle. This may be because

Table 2: Comparison of pre-operative and 6-month post-operative quality of life scores			
SF 36 domain	Pre-operative mean	Post-operative mean	P-value
General health	18.9±SD 2.7	66.7±SD 3.7	P<0.001
Physical functioning	44.1±SD 2.7	93.3±SD 3.7	P<0.001
Role-limitations due to physical health	20.8±SD 41.7	79.2±SD 41.0	P<0.001
Bodily pain	16.8±SD 6.4	85.8±SD 5.9	P<0.001
Emotional wellbeing	27.6±SD 3.3	64.0±SD 4.7	P<0.001
Role limitations due to emotional problem	25.0±SD 43.7	64.0±SD 41.0	P<0.001
Vitality (energy/vitality)	18.9±SD 2.7	66.7±SD 3.7	P<0.001
Social functioning	32.9±SD 3.8	57.4±SD 4.9	P<0.001

this was the commonest surgery performed in our study or due to a technical error in the surgical procedure. In all these patients, the wound dehiscence involved the T junction at the site of incision which is the common site for ischemia. All patients were successfully managed conservatively. The two patients who developed superficial surgical site infections were also managed conservatively. We only had one main complication of nipple loss, which ultimately required surgical debridement and re-suturing. This patient underwent Wise pattern mammoplasty with a superomedial pedicle and had 1.55 kg breast tissue resection.

Despite the small number of patients in our cohort, it was encouraging that our complication rates were in keeping with much larger series reporting outcomes which shows that reduction mammoplasty is a safe and effective procedure with few major complications even for new centers. <sup>18,19</sup> We believe that it was a timely decision to address the issue of symptomatic macromastia and by introducing reduction mammoplasty through our breast care clinic despite the considerable workload with breast cancer patients.

All patients in our study showed a statistically significant improvement in the satisfaction rates for breast aesthetics. Similar experiences were reported for brassiere strap grooving, inframammary intertrigo, and difficulty in finding properly fitting brassieres and clothing. This improvement in patients' satisfaction was maintained at 6 months following surgery. Our findings also demonstrated that all patients had a significant improvement in pain following surgery and this improvement in pain was unaltered at 6 months post-procedure. These findings of improvement in pain and outcome are consistent with similar studies performed on this subject.<sup>22-24</sup>

Our results on the QOL indicated not only a reduction on the physical and psychological burden of macromastia but also an improvement in social QOL as well. These improvements are evident at the 6-month follow-up visit which is indicative of sustained long-term physical and psychosocial gains and confirms the benefits of surgery.

# Limitations of the study

A limitation of our study was that we did not evaluate the positive effects on sexual function, and lung function tests and to make an objective evaluation of the aesthetic outcome of the surgery, which would have given us a more in-depth and detailed analysis of the benefits and outcome following reduction mammoplasty.

# CONCLUSION

To the authors' knowledge, this is the first study performed on the outcome of reduction mammoplasty on symptomatic macromastia in Sri Lanka. Our study demonstrated that reduction mammoplasty caused a significant improvement in the overall QOL and psychological well-being with a significant reduction in pain for patients suffering from macromastia. More local studies are needed to assess the prevalence of symptomatic macromastia in Sri Lanka. Despite the well-established association between macromastia and negative healthrelated QOL which is surgically treatable, this not a wellspoken or addressed topic among the health professionals in Sri Lanka. Therefore, creating more awareness among the public to encourage women to openly discuss breast-related symptoms and to overcome socio-cultural taboos and barriers is a timely necessity. It may also be important to educate the medical community in Sri Lanka regarding symptomatic macromastia, its common clinical presentations, and management so that the patients suffering in silence could be identified and offered the appropriate treatment.

# **ACKNOWLEDGMENTS**

This article was previously posted to the Research Square preprint server on July 27, 2022. https://doi.org/10.21203/rs.3.rs-1864555/v1.

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#### **Authors' Contributions:**

KW- Definition of intellectual content, literature survey, prepared first draft of manuscript, implementation of study protocol, data collection, data analysis, manuscript preparation; UJ- Definition of intellectual content, literature survey, implementation of study protocol, data analysis, manuscript preparation and submission of article; MGRM- Data collection, manuscript preparation, editing, and manuscript revision; SHDS- Data collection, manuscript preparation, editing, and manuscript revision; AK- Data collection, manuscript preparation, editing, and manuscript revision; AMS- Data collection, manuscript revision.

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Source of Support: Nil, Conflicts of Interest: None declared.