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Expanding Global Surgery Services to Include Reduction Mammaplasty Procedures

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Background: Global surgery is a multidisciplinary field that aims to deliver equitable and improved surgical services. Surgical care has been previously considered to play a limited role in the global burden of disease, in part due to its complexity and associated expense. A functional health system mandates high-quality, accessible, and timely surgical care.

Methods: Literature was reviewed on the role of plastic and reconstructive surgery in global surgery programs, reduction mammaplasty, and quality of life (QoL). Definitions of emergency and essential surgical care were explored to understand which surgical procedures are included in these programs. Reduction mammaplasty is the most researched aesthetic surgery procedure when considering QoL.

Results: The surgical conditions treated by plastic surgeons comprise a large proportion of the global surgical disease burden and disproportionately affect individuals in low- to middle-income countries. Over time, reconstructive surgery has gained equivalence to other surgical fields, partly due to a broader understanding of health; the need for psychological well-being; and the fact that some aesthetic surgery procedures are now considered reconstructive, such as a reduction mammaplasty. Essential surgery comprises low-cost, basic surgical procedures that prevent disability or life-threatening complications and may be performed at the district hospital level. Reconstructive plastic surgery improves QoL in multiple domains, including reduction mammaplasties.

Conclusions: The cost-effectiveness and QoL improvements of reduction mammaplasty have been elucidated; therefore, this can make a real difference for many patients in developing countries. Consideration should be given to expanding the essential surgical care package to include reduction mammaplasty. *(Plast Reconstr Surg Glob Open 2025;13:e6609; doi: 10.1097/GOX.0000000000006609; Published online 12 March 2025.)*

INTRODUCTION

Approximately 5 billion people do not have access to surgical care that is safe, timely, and affordable.[1] One-third of the global burden of disease is accounted for by surgical conditions.[2] Achieving the Sustainable Development Goals 2030 (SDG) is enabled by global surgery by eliminating poverty (SDG1), improving well-being and health (SDG3), encouraging economic growth (SDG8), and reducing inequality (SDG5 and SDG10).[3]

High mortality rates from treatable surgical conditions in low- to middle-income countries (LMICs) are accounted for by the chronic surgical workforce shortages, low operative case volumes, barriers to accessing surgical care, and marginalization of some groups of society.[3] In sub-Saharan Africa, surgical conditions account for 38 disability-adjusted life years (DALYs) compared with less than 9 DALYs in developing countries.[4] A DALY is defined as 1 year of healthy life lost; it has remained an acceptable substitute for assessing the cost-effectiveness of interventions.[5]

There is a need to make plastic and reconstructive surgery care essential in reducing the global disease burden. The Lancet Commission on Global Surgery report initiated a shift in focus from direct patient care models to sustainable global surgical models.[6]

Multiple determinants of global health require national and international collaboration among governments, nongovernmental organizations, private entities, and

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other actors.[3] Although global health surpasses national boundaries, politics and geographic location play a role in the equity of global healthcare provision.[3]

Surgical care has been previously considered to play a limited role in the global burden of disease, in part due to its complexity and associated expense.[7] A functional health system mandates high-quality, accessible, and timely surgical care.[7]

The surgical conditions treated by plastic surgeons comprise a large proportion of the global surgical disease burden and disproportionately affect individuals in LMICs.[8] There is a global shortage of plastic surgeons, especially in LMICs.[8] As a discipline, plastic and reconstructive surgery has always been a leader in the development of global surgery and an enduring tradition of humanitarian aid.[8]

Reduction mammaplasties have often been referred to as aesthetic or cosmetic procedures. The American Medical Association in June 1989 defined cosmetic and reconstructive surgery as follows:

> "Cosmetic surgery is performed to reshape normal structures of the body in order to improve the patient's self-esteem. Reconstructive surgery is performed on abnormal structures of the body, caused by congenital defects, developmental abnormalities, trauma, infection, tumors or disease. It is generally performed to improve function but may also be done to approximate a normal appearance."[9]

In a study done by Roy et al,[10] breast procedures such as augmentation, breast reduction, and mastopexy were referred to as aesthetic breast procedures. Due to the positive impact on quality of life (QoL) of breast reduction, this is now commonly viewed as reconstructive surgery. Many articles indicate that bilateral breast reductions are not a cosmetic operation and that macromastia places stress on the upper spine, leading to backache, shoulder pain, headaches, and intertrigo.[11]

More than 100,000 women worldwide undergo reduction mammaplasty for macromastia every year, with symptomatic relief as the motivating factor for the majority of these women.[12] Macromastia is defined as excessive enlargement of breast tissue, which is more than the normal range.[13] The precise causation of macromastia is unknown, and some triggers, such as hormones, mutations in oncogenes, and anovulation, have been suggested.[13] It may cause a wide variety of symptoms (psychosomatic, physical, or behavioral), and in most cases, reduction mammaplasty may adequately treat these impairments.[14] Physical symptoms experienced include pain in the shoulders, back, chest and neck, spinal degenerative changes, and chronic headache.[15] Conservative treatment options have been suggested but fail to improve QoL and do not have long-lasting effects on symptom reduction.[16] Jud et al[13] showed that when macromastia is treated conservatively, considerable healthcare costs arise, with loss of productivity due to sick days taken and the associated costs of physical therapy.

METHODS

Two authors conducted a literature review on the role of plastic and reconstructive surgery in global surgery programs, reduction mammaplasty, and QoL. Definitions of emergency and essential surgical care (EESC) were explored to understand which surgical procedures are included in these programs. Reduction mammaplasty was the most researched reconstructive surgery procedure when considering outcomes and QoL.

Takeaways

Question: Should the emergency and essential surgical care package include reduction mammaplasty?

Findings: Reduction mammaplasty can improve quality of life.

Meaning: Reduction mammaplasty can improve quality of life in developing countries, and consideration should be given to include it in the emergency and essential surgical care package.

LIMITATIONS

This is the first review that considers expanding the EESC package to include reconstructive surgery procedures. There is a paucity of quantitative evidence, and the hope is that this review will form the basis of future quantitative studies.

RESULTS

Sustainability and patient safety are imperative for maintaining global surgical partnerships and facilitating plastic surgical care in LMICs. Best practices are essential in establishing global health partnerships, focusing on cultural understanding and humility, international collaboration, and technology and innovation. Global plastic surgical initiatives should incorporate these 3 core components to optimize patient experiences and reduce inequalities in plastic surgical care.[6]

Educating local plastic surgeons is crucial to creating sustainable plastic surgery interventions worldwide. Virtual platforms have grown popular and effective since the COVID-19 pandemic and are beneficial in plastic surgery for both diagnosis and teaching methods. However, significant potential remains to develop more effective virtual platforms for educating plastic surgeons in LMICs, which would lower costs and sustainably increase surgical capacity in underserved areas.[17] Reduction mammaplasty (breast reduction) is the most researched reconstructive surgery procedure when considering QoL.[18]

Reduction mammaplasty was shown to have the highest improvement in the 36-item Short-Form (SF-36) scale scores, notably in the social and physical functioning domains.[18] The SF-36 is a validated scale that explores multiple limitations in daily life, namely physical activity, social activity, mental health, and others.[19] There is a wealth of research that discusses the benefits of reduction mammaplasty surgery on the physical, sexual, and psychosocial well-being of adult patients.[20]

From January 1997 to June 1997, the Department of Reconstructive Plastic Surgery at Stockholm Söder Hospital/Karolinska Hospital conducted a prospective study with

preoperative and postoperative assessments at 6 and 12 months in 49 women, 20 years of age or older. The results showed that a reduction mammaplasty significantly reduced pain in all locations, and improvements continued up to 12 months postoperatively. The patients scored significant improvements in all subjective problems ($P < 0.001$) except sleep. In some areas, such as sexual, femininity, and social contacts, the results exceeded the preoperative expectations. Reduction mammaplasty significantly improved QoL; the results were similar after 6 and 12 months, indicating long-term improvement, that is, the women were normalized in health-related QoL as judged by the SF-36.[21]

A single-center study done by Chao et al[15] was designed to show objectively the benefits of breast reduction surgery to improve physical disabilities related to breast hypertrophy and improve their QoL. Fifty-five consecutive patients with an average age of 38 years undergoing breast reduction surgery were recruited. The North American Spine Society Lumbar Spine Outcome Assessment Instrument was used to assess patients' disability, expectations for treatment, and satisfaction with treatment. Muscle strengths of the pectoralis major, minor, rhomboid, middle trapezius, and lower trapezius muscles and postural measures were obtained. The information was collected preoperatively and 6 months postoperatively for comparison. There was a statistically significant improvement in muscle strength, and all postural measures showed improvement postoperatively, with head translation and cranial rotation showing statistical improvement ($P < 0.05$). By standardizing and quantifying preoperative and postoperative evaluations with validated pain scoring, questionnaires, and standardized muscle and posture testing, it was shown that breast reduction for symptomatic breast hypertrophy could have a significant improvement in the measures of pain, disability, muscle weakness, and poor posture.[15] In 2009, the BREAST-Q reduction module, a comprehensive and reliable patient-reported outcome instrument, was made available, which focused on details such as the appearance of breasts, the patients' satisfaction with the procedure, and the care they received from their healthcare providers.[22]

The BREAST-Q stands out as a questionnaire designed specifically for bilateral reduction mammaplasty. Its development adheres to international standards, making it a unique and reliable tool in the field.

In a study conducted by Wampler et al[23] in 2021, a substantial prospective set of reduction patients' BREAST-Q scores revealed that patients seeking reduction mammaplasty were burdened with significant symptoms. However, after the surgery, they reported a QoL that was either equal to or higher than that of the average woman, indicating significant improvements in their well-being.[23]

Reduction mammoplasty led to higher patient reported outcome measures scores than before the procedure, consistent with previous studies. Patients noted improvements in their mental and physical health.[22]

DISCUSSION

The World Health Organization[24] (WHO) definition of health is "a state of complete physical, mental, and social well-being and not merely the absence of disease or infirmity." Saboye[25] asserts that if one considers the WHO definition as the standard of health, reconstructive surgery should be considered essential to overall health due to its effect on physical, mental, and social aspects of welfare.[25] Breast hypertrophy creates a functional disability, adversely affecting the QoL due to disproportionate upper body weight.

Reduction mammaplasty is a standard procedure in plastic surgery. Patients often seek an operation for neck and lower back pain and social and emotional problems. The evaluation of health issues based on the patient's opinion has become an essential and reliable method for analyzing alterations resulting from treatment. To evaluate the impact of plastic surgery on the QoL of patients with mammary hypertrophy, using the SF-36 standardized questionnaire is a reliable method for assessing the patient's needs and outcomes.[26] Using the BREAST-Q questionnaire is a reliable tool for accessing patient reported outcome measures following surgery.[22,23]

Essential surgery focuses on providing accessible, low-cost interventions at the district hospital level to prevent disability. Traditional criteria determining eligibility for breast reduction have included body mass index, minimum weight to be removed at surgery, and consideration of symptoms such as back or neck pain.[27] When taught correctly, reduction mammaplasty is a procedure that may be performed with standardized and reliable techniques.[28] Reduction mammaplasty has no mesh or use of an implant, and the only excess disposable cost is that of surgical sutures.[11] Therefore, it can be performed in developing countries without the associated costs of specialized equipment or consumables, with the only significant requirement being adequately trained surgeons and basic surgical facilities. It has been shown since 1996 that reduction mammaplasty may be performed as a day-case procedure on an ambulatory basis.[29] A Cochrane review affirmed that drains were not necessary after the procedure, thereby reducing the postoperative care requirement for the procedure.[30] The cost-effectiveness and QoL improvements of the procedure have been elucidated; therefore, this surgery can make a real difference for many patients in developing countries. Consideration should, therefore, be given to expanding the essential surgical care package to include reconstructive procedures such as reduction mammaplasty.

Plastic surgeons have long been responsible for performing breast reductions because the nipple–areolar complex is most commonly carried on a flap, and flap design and movement have always been the area of expertise of plastic surgeons.[11] The 4 key elements of the operative approach in reduction mammaplasty are the incorporation of a pedicle to carry sensation and vascularity to the nipple–areolar complex, removal of excess breast tissue to achieve volume reduction, reduction of the excess skin envelope, and achievement of an attractive, well-projected conical breast.[31] Breast reduction techniques are standardized and have been shown to be reliable and applicable to

the wide range of breast sizes in patients who may present for surgical treatment.[26] These techniques are teachable, with some simulation models becoming available to teach preoperative therapeutic mammaplasty markings.[32]

The QoL improvement for patients undergoing reduction mammaplasty for symptomatic macromastia is undisputed. Studies have shown that when comparing the costs of surgical treatment with ongoing conservative treatment costs, the additional upfront cost of surgery is recovered in a relatively short period.[16] A cost-utility analysis of reduction mammaplasty showed a saving of EUR 380 for every quality-adjusted life year gained. When comparing the cost of quality-adjusted life year treatments for preventative interventions or treatment of benign disease, it is evident that the associated cost of reduction mammaplasty is low.[16] In a study by Crittenden et al,[33] the cost-effectiveness of breast reduction was proven.[33] The mean hospital cost per patient was $11,857.[26] The procedure, therefore, not only improves overall QoL but also leads to significant savings in the long term.[15]

Global surgery remains an essential part of global health, and with the chronic surgical workforce shortages, low operative case volumes, barriers to accessing surgical care, and marginalization of some groups of society, it has become important to identify which procedures should form part of EESC. Since 1948, the WHO definition of health has emphasized the importance of both physical and psychosocial well-being. Reconstructive plastic surgery has been shown to improve QoL in multiple domains, both physically and psychosocially. Reduction mammaplasty (breast reduction) is the most researched reconstructive surgery procedure when considering QoL, and the QoL improvement for patients undergoing surgery for symptomatic macromastia is undisputed. Techniques for reduction mammaplasty are teachable and standardized and could be performed at district hospitals as ambulatory or day-case surgery. The procedure itself is cost-effective and may prevent long-term disability. Therefore, this review calls for an expansion of the essential surgical care package of global surgery programs to consider therapeutic mammaplasty as one of the core surgical procedures offered.

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DISCLOSURE

The authors have no financial interest to declare in relation to the content of this article.

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