Population Preferences of Undergoing Brachioplasty for Arm Laxity

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Background: The number of patients requesting surgical procedures performed for brachioplasty and massive weight loss is increasing. The authors set out to quantify the health state utility outcome assessment of living with arm deformity requiring brachioplasty.

Methods: Utility assessments using the visual analog scale (VAS), time trade-off (TTO), and standard gamble (SG) were used to obtain utilities scores for arm deformity, monocular blindness, and binocular blindness from a sample of the general population and medical students. Linear regression and Student *t* test were used for statistical analysis. A *P* value less than 0.05 was deemed statistically significant.

Results: All the measures for arm deformity of the 107 volunteers (VAS, 0.80 ± 0.14; TTO, 0.91 ± 0.12; SG, 0.94 ± 0.10) were significantly different ($P < 0.001$) from the corresponding measures for monocular blindness and binocular blindness. When compared to the sample of the general population, having a medical education demonstrated a statistical significance of being less likely to trade years of life and less likely to gamble risk of death for a procedure such as a brachioplasty. Race and sex were not statistically significant independent predictors of risk acceptance.

Conclusions: We have objectified the health state of living with upper arm deformity requiring brachioplasty. Utility outcome scores (VAS, 0.80 ± 0.14; TTO, 0.91 ± 0.12; SG, 0.94 ± 0.10) were comparable to living with health states such as aging neck needing rejuvenation, excess skin in the thighs necessitating thigh lift, and massive weight loss requiring panniculectomy based on previously reported studies.

Key Words: utility assessment, QALY, brachioplasty, body contouring, arm deformity

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Contour deformities of the upper arm can occur with increasing age or following massive weight loss to which surgical rejuvenation must address the degree of deformity.[1–4] If the arm is viewed as a sleeve, it has length and width, 2 planes in which the effects of aging and weight loss are primarily evident.[2,4] Furthermore, there is progression of the inferior curve of the upper arm in addition to loss of supporting structures resulting in ptosis or a "bat wing" appearance.[5] These issues can be resolved by reduction of the skin and subcutaneous fat.[3] Brachioplasty is a means of rejuvenating the upper arm.[3] It was first introduced in 1930 by Thorek[6] and since then a wide variety of modifications and approaches have been developed to enhance the appearance of the scar and improve the contour of the arm.[4,7–15] Recently, this procedure has grown in popularity, especially following massive weight loss.[1] With the advent of liposuction, the results of brachioplasty have improved significantly not only because it minimizes scarring and reduces complications but also as result of removal of excess fat which allows for improved sculpting of the entire arm.[3,16]

Despite the advances made in refining brachioplasty procedures, it is not without its limitations. It is regularly associated with the development of complications including wound dehiscence, seroma, and paresthesias.[1] In addition, the problem of skin ptosis can remain an issue.[3] Another cause for concern is poor scar formation, as such placement of the arm scar serves as a constant theme for debate among plastic surgeons.[1] To gain a better understanding of the health burden associated with living with an arm deformity requiring brachioplasty, we aimed to objectify this health state with validated measures.

Utility indices are standardized tools that offer a validated means of measuring the impact of a disease state or health condition.[17] They have been implemented previously to assess risk/benefit for a variety of conditions.[18–30] Furthermore, they serve to aid the surgical decision-making process as well as in the determination of the cost effectiveness of health interventions.[19,29] The most widely used tools in outcomes research are time trade-off (TTO), standard gamble (SG), and visual analogue scale (VAS).[31–33] The utility score of each tool is translated to a numeric value ranging from 0 to 1 representing the best and worst possible health states (1 being the best and 0 being the worst).[19]

In TTO, the number of years living in a disease state is compared to the number of years living in the best possible health state. The ratio of these is used to ascertain the TTO utility value. In SG, it is determined whether living in the disease state is worth the risk of undergoing treatment knowing that the outcome could either be positive (an improved health state) or negative (immediate painless death). This value therefore represents the respective probability of success. Finally in VAS, a score is provided indicating the most accurate representation of perception of a given health state.[19,34,35]

Understanding the utility outcomes scores of living with an arm deformity necessitating brachioplasty may help surgeons in the patient selection process to reduce the risk of wound-healing complications and enhance outcomes.

PARTICIPANTS AND METHODS

Study participants were prospectively recruited through anonymous, voluntary participation in an online utility assessment website. All participants were obligated to sign an electronic consent form to take part in this study. Consent was also provided by the patient for use of her photograph (Fig. 1). These ethical regulations were mandated by the McGill University institutional research ethics board which approved this study. A series of validated questions were used to present the health states of living with an arm deformity requiring brachioplasty, monocular blindness, and binocular blindness through which the utility outcomes were ascertained. Patients were excluded from participation if they ranked monocular blindness with

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