

Postoperative Psychological Impact on Teenagers after Gynecomastia Correction

Riham Lashin, MD
Ramy A. Youssef, MBBCh
Ahmed Elshahat, MD
Eman Nagy Mohamed, MD

Background: Gynecomastia is common among teenagers. Most published research focused on how surgery is effective in enhancing the aesthetic appearance of the breast. Limited information is already known about the psychosocial benefits of surgical interventions. This study explores and assesses the surgical, cosmetic, and psychological outcome of gynecomastia correction in teenagers.

Methods: This prospective study included 20 teenagers with Simon grade IIA gynecomastia. The assessment included complications, patients' satisfaction, Manchester Scar Scale, and Li et al questionnaire at 12 months postoperative. Rosenberg Self-Esteem Scale, 36-Item Short Form Survey (SF-36) for quality of life, and school achievement level were evaluated 1 month preoperative and 12 months postoperative. Statistical analysis was done.

Results: Patients were aged 13-19 years old. The follow-up period was 12±36 months. Postoperative complications included seroma formation (n = 1) and mild asymmetry (n = 3). Results were "uniformly good to excellent" on a satisfaction scale. The Manchester Scar Scale shows the lowest score, which denotes the highest outcomes. The Li et al questionnaire showed a positive overall change. Comparing Rosenberg Scale scores pre- and postoperatively revealed higher scores postoperatively, which indicate higher self esteem. Comparing SF-36 pre- and postoperatively showed a significant increase in postoperative quality of life. Comparing school achievement pre- and postoperatively showed marked improvement postoperatively. Results were highly statistically significant.

Conclusions: Surgical treatment of teenage gynecomastia is beneficial for different psychosocial domains. Pull-through of the mammary gland combined with liposuction provides satisfactory cosmetic results. Patients who underwent surgery reported a significant improvement in psychosocial load, better school achievement, higher quality of life, and better self-esteem. (*Plast Reconstr Surg Glob Open* 2023; 11:e5094; doi: [10.1097/GOX.0000000000005094](https://doi.org/10.1097/GOX.0000000000005094); Published online 22 June 2023.)

INTRODUCTION

Idiopathic gynecomastia is a common clinical diagnosis in male teenagers, aged between 13 and 19 years.¹⁻³ It is defined as a benign hypertrophy of the glandular structure.¹ The percentage of male teens affected ranged between 30% and 65%, with involution in around 1-2 years.⁴⁻⁶ By 17 years old, about 10% of patients may still complain of persistent gynecomastia.⁷ Therefore, surgical treatment is not indicated in the first year of presentation.^{4,5}

There is no solid indication for gynecomastia surgery because physical health is not compromised.^{8,9} Particularly in teens, gynecomastia should be surgically corrected if it causes pain or psychosocial distress, such as decreased sense of self-esteem, and accordingly, avoidance of social interactions.¹⁰

Several classifications for gynecomastia are available. The one by Simon et al¹¹ in 1973 is the most commonly used, and classifies male breasts into the following grades: grade I, minor hypertrophy without skin excess; grade IIa, moderate hypertrophy without skin excess; grade IIb, moderate hypertrophy with minor skin excess; and grade III, gross hypertrophy with skin excess with enlarged nipple-areola complex.

Surgical correction of gynecomastia includes either glandular tissue excision, liposuction, skin excision, or any combination of these.¹² Liposuction only is sufficient in patients with predominant fatty components.

From the Plastic, Burn, and Maxillofacial Surgery Department, Faculty of Medicine, Ain Shams University, Cairo, Egypt.

Received for publication March 16, 2023; accepted May 5, 2023.

Copyright © 2023 The Authors. Published by Wolters Kluwer Health, Inc. on behalf of The American Society of Plastic Surgeons. This is an open-access article distributed under the terms of the [Creative Commons Attribution-Non Commercial-No Derivatives License 4.0 \(CCBY-NC-ND\)](https://creativecommons.org/licenses/by-nc-nd/4.0/), where it is permissible to download and share the work provided it is properly cited. The work cannot be changed in any way or used commercially without permission from the journal.

DOI: [10.1097/GOX.0000000000005094](https://doi.org/10.1097/GOX.0000000000005094)

Disclosure statements are at the end of this article, following the correspondence information.

If liposuction is insufficient, then pull-through of the mammary gland is done. Other techniques, such as the open incisional technique and subcutaneous mastectomy, can be performed alone or with liposuction. Minimally invasive approaches are usually preferred.¹²

Gynecomastia surgery is usually associated with minimal morbidity, such as hematoma, seroma, contour deformity, and saucer-shape deformity.⁹ Other possible complications for surgical correction include wound infection, hypertrophic scar formation, postoperative numbness, recurrence of gland hypertrophy, and considering surgery ineffective and unsatisfying.¹³

Previous studies performed on gynecomastia in teenagers already reported significant negative impact on their psychosocial health.^{10,14} Li et al in 2012 reported that 94.8% of gynecomastia patients are psychologically distressed.¹⁵

In 1961, Schonfeld published a study proposing that gynecomastia necessitates both surgical and psychological treatment.¹⁶ Limited research studied the relationship between the psychological aspects of gynecomastia and how it is affected by surgical correction.¹⁷

AIM OF WORK

This study focused on the psychosocial impacts of teenage gynecomastia, evaluating long-term postoperative patient satisfaction. It also assesses the complication, and the surgical, cosmetic, and psychological outcome of pull-through of the mammary gland combined with liposuction in management of teenagers with bilateral Simon grade IIA gynecomastia.

PATIENTS AND METHOD

This is a prospective study conducted on a total of 20 teenagers with bilateral Simon grade IIA gynecomastia, who underwent pull-through delivery of the mammary gland through lateral periareolar incision, combined with liposuction of the fatty component as described previously in the Elshahat and Lashin publication in 2020.¹⁸ The study was done between November 2019 and November 2021 at the Plastic, Burn, and Maxillofacial Surgery Department of El-Demerdash Hospital, Faculty of Medicine, Ain Shams University, Cairo, Egypt.

The median age at the time of surgery was 16 years, with mean age \pm SD of 16 ± 2 , ranging from 13 to 19 years. All patients were of average weight and average BMI, with no history of bariatric surgery, and had normal male size areola (2.5 mm in diameter, the average diameter of male areola as proposed by Beckenstein et al).¹⁹ All these patients were surgically indicated because of the social discomfort. The indication for surgery was mainly cosmetic.

This study excluded patients who were younger than 13 years and older than 19 years, patients with Simon grade I, IIB, and III gynecomastia, patients with secondary causes, postbariatric surgery patients, patients who were morbidly obese with high BMI, patients with larger size areola (>2.5 mm in diameter), noncooperative patients, patients who were unable to understand the questionnaire, and patients with a less than 12-month postoperative follow-up period.

Takeaways

Question: This study explores and assesses the surgical, cosmetic, and psychological outcome after gynecomastia correction in teenagers.

Findings: A prospective study was conducted on 20 teenagers with Simon grade IIA gynecomastia. The assessment included complications, patient satisfaction, Manchester Scar Scale (MSS), and Survey for Quality-of-Life Assessment, and School Achievement Level was evaluated. Results were highly statistically significant, with a significant increase in postoperative quality of life. Comparing school achievement pre- and postoperatively showed marked improvement postoperatively.

Meaning: Patients who underwent surgery reported a significant improvement in psychosocial load, better school achievement, and higher quality of life.

Ethical Considerations

After approval by the ethical review committee of faculty of medicine, Ain Shams University, Cairo, Egypt, all patients or guardians who agree to participate in the study signed an informed written consent for intervention, including advantages, disadvantages, and risks of possible complications, according to the local ethical committee regulation, with absolute confidentiality for names and addresses of patients.

Postoperative photographs were taken at 3-, 6-, and 12-month postoperative visits, with anterior, oblique lateral, and dead lateral views. Written consent was obtained from all patients to publish their photographs.

The follow-up period ranged from 12 ± 36 months, with a median of 18 months. Follow-up examinations were performed with assessment of wound healing disorders, revisions, scar, numbness of nipples, retraction of the nipple region, nipple-areola viability, and postoperative breast symmetry.

Patients were asked to report on their general satisfaction with surgery (satisfied/not satisfied), and aesthetic results 12 months postoperative on a patient satisfaction scale (excellent, very good, good, fair, and poor), including breast contour and NAC position.²⁰ The Manchester Scar Scale (MSS) includes scar color, shine, contour, and distortion. It was conducted 12 months postoperative. Score ranges were 4–14. Lower scores denote better outcomes, with best outcome being 4.²¹ Surgical results were assessed with the self-assessment questionnaire developed by Li et al, which assessed postoperative breast contour, scar, and self-esteem. The questionnaire was also conducted 12 months postoperative to evaluate the satisfaction rate.¹⁵

The Rosenberg Self-Esteem Scale assesses global self-worth by measuring positive and negative impressions about the self. It includes a 10-item scale. All items are answered using a four-point Likert scale and ranging between 10 and 40. Higher scores mean higher self-esteem. Assessment was done at 1 month preoperative and 12 months postoperative.²²

School achievement level includes excellent (score 20), very good (score 18–19), good (score 14–17), fair (score

10–1), and poor (score below 10). Assessment was done at 1 month preoperative and 12 months postoperative.²³

The 36-Item Short Form Survey (SF-36) for quality of life contains eight scaled scores. Scores range from 0 to 100. Lower scores indicate higher disability, and vice versa. Sections include many items, such as physical functioning, pain, general health perceptions, mental, emotional, and social functioning. It was assessed 1 month preoperative and 12 months postoperative.²⁴

Statistical Analysis

Data were analyzed using the Statistical Package for Social Sciences (SPSS version 27). Descriptive analyses were performed to obtain the means and deviations for quantitative data, and numbers and frequencies for qualitative data. Different types of graphs were used according to the type and distribution of data (bar and error bars).

Bivariate analyses were performed using the Wilcoxon signed rank test, the marginal test of homogeneity, and the Kruskal-Wallis test. A *P* value less than 0.05 was considered significant.

RESULTS

There was no evidence of malignancy in any of the specimens. Early postoperative complications included seroma formation (*n* = 1) that required a single bedside aspiration through the lateral periareolar incision, followed by compressive vest. No hematoma or postoperative wound infection occurred.

Late complications included mild breast asymmetry with unequal breast size in 15% of patients (*n* = 3), which required no further intervention. One of them was because of chest wall deformity, another one was because of asymmetrical NAC position preoperatively, and the third patient had asymmetrical hypertrophy of pectoralis major muscle preoperatively. There was no nipple or skin necrosis, compromised vascularity of nipple areola, contour irregularities, inadequate resection and residual swelling, disruption or dehiscence of periareolar suture line, keloid or hypertrophic scarring, nipple-areola malposition or retraction, inverted nipples, residual lax skin excess, or revision in any of the patients in this study. Hypesthesia of nipple areola was observed in most patients immediately postoperatively, but it was transient and resolved spontaneously within 6 months.

Table 1 shows descriptive analysis to obtain the means, deviations, medium, minimum, and maximum of all descriptive data, including patients' age, postoperative MSS, Li et al self-assessment postoperative questionnaire, Rosenberg Self-Esteem Scale 1 month preoperative and 12 months postoperative, and SF-36 1 month preoperative and 12 months postoperative.

All patients were satisfied with their cosmetic outcome. Figures 1A and 2A show preoperative photographs of patients aged 16 and 19 years old, and Figures 1B and 2B show 6-month postoperative photographs of the same patients. Results were reported as “uniformly good to excellent” on a postoperative patient satisfaction scale, as all patients were satisfied with their breast contour and

Table 1. Descriptive Analysis to Obtain the Means, Deviations, Medium, Minimum, and Maximum of All Descriptive Data

Patient age	Mean ± SD	16 ± 2
	Median	16
	Min–max	13–19
MSS postoperative	Mean ± SD	5 ± 1
	Median	5
	Min–max	4–8
Li et al self-assessment questionnaire postoperative	Mean ± SD	8 ± 1
	Median	9
	Min–max	7–9
Rosenberg Self-Esteem Scale 1 mo preoperative	Mean ± SD	13 ± 2
	Median	12
	Min–max	10–16
Rosenberg Self-Esteem Scale 12 mo postoperative	Mean ± SD	36 ± 4
	Median	36
	Min–max	28–40
SF-36 1 mo preoperative	Mean ± SD	43 ± 14
	Median	40
	Min–max	19–65
SF-36 12 mo postoperative	Mean ± SD	84 ± 6
	Median	83
	Min–max	75–94

nipple-areola position postoperatively. Three patients reported good results, five patients reported very good results, and 12 patients reported excellent results. The three patients who reported good results complained of some postoperative breast asymmetry.

Postoperative MSS revealed that all patients of this series show the lowest score, which denotes the highest outcomes. Results ranged between 4 and 8, with median score of 5 and mean ± SD of 5 ± 1 (Table 1).

The results evaluated with the Li et al self-assessment questionnaire at a minimum of 12 months postoperative found remarkable improvements in all domains, and improvement in self-confidence, scores ranged between 7 and 9 with median score of 9, and mean ± SD of 8 ± 1 on a 10-point scale (Table 1).

When comparing the Rosenberg Self-Esteem Scale done 1 month preoperative (average score was 10–16, with median score of 12 and mean ± SD of 13 ± 2), and 12 months postoperative (average score was 28–40, with median score of 36 and mean ± SD of 36 ± 4) (Table 1), revealing higher scores postoperatively, which indicates that the self-esteem of patients improved dramatically postoperatively and revealed significant decrease in social phobias and less social anxiety when compared with preoperative scores. The mean and the 95% confidence interval increased, and the *P* value was highly significant statistically using the Wilcoxon signed rank test.

When comparing the SF-36 for quality of life, range of results 1 month preoperative was 19–65, with median score of 40 and mean ± SD of 43 ± 14, while at 12 months postoperative, the range was 75–94, with median score of 83 and mean ± SD of 84 ± 6 (Table 1). Denoting those patients who underwent surgery noted a dramatic improvement in quality of life of patients postoperatively, with highly statistically significant difference between

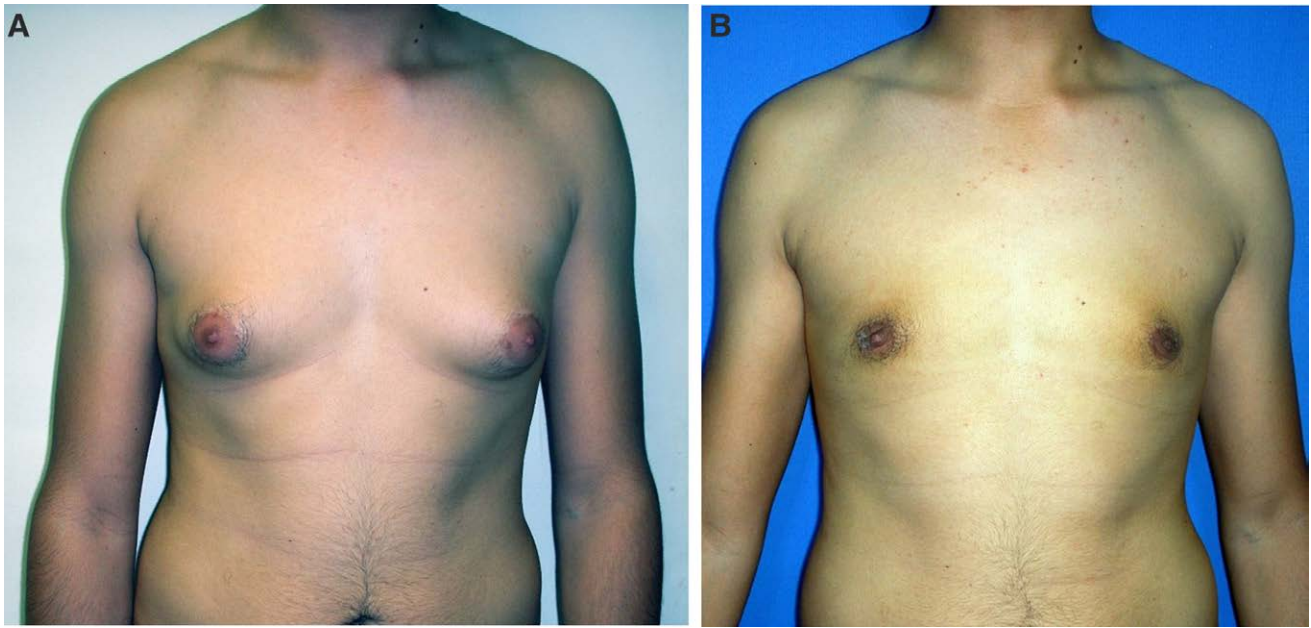


Fig. 1. Anterior view of a 16-year-old male patient with gynecomastia. A, Preoperative. B, Postoperative.

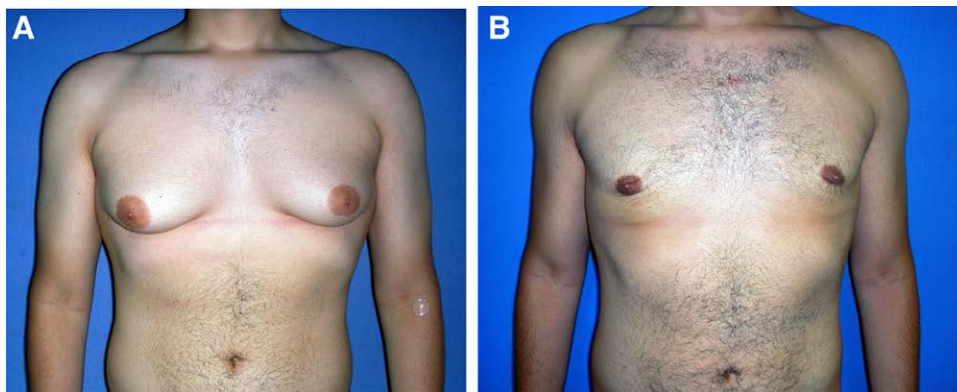


Fig. 2. Anterior view of a 19-year-old male patient with gynecomastia. A, Preoperative. B, Postoperative.

pre and postoperative quality of life using the Wilcoxon signed rank test.

Table 2 shows the combined data of both Rosenberg Self-Esteem Scale and SF-36 for quality of life pre and postoperatively, and comparing data, it shows marked improvement postoperatively, with highly statistically significant difference.

Comparison between school achievement score pre- and postoperatively showed marked improvement

postoperatively, and the difference is highly statistically significant using the marginal test of homogeneity, as shown in Figure 3. This study found that patients who underwent surgery noted a better school achievement.

While studying the correlation between the different postoperative patient satisfaction levels and different scores postoperatively, including the MSS, Li et al self-assessment questionnaire, Rosenberg Self-Esteem Scale, and SF-36, all were found to be significantly related to the

Table 2. Combined Data of Both Rosenberg Self-Esteem Scale and SF Survey for Quality of Life Pre- and Postoperatively, and Comparing Data

Assessment	N	Mean	SD	Wilcoxon Signed Rank Test	P
Rosenberg Self-Esteem Scale 1 mo preoperative	20	12.50	1.987	3.21	<0.001*
Rosenberg Self-Esteem Scale 12 mo postoperative	20	35.90	4.154		
SF survey 1 mo preoperative	20	42.65	13.608	3.99	<0.001*
SF survey 12 mo postoperative	20	83.65	6.418		

*Indicates significant statistical difference.

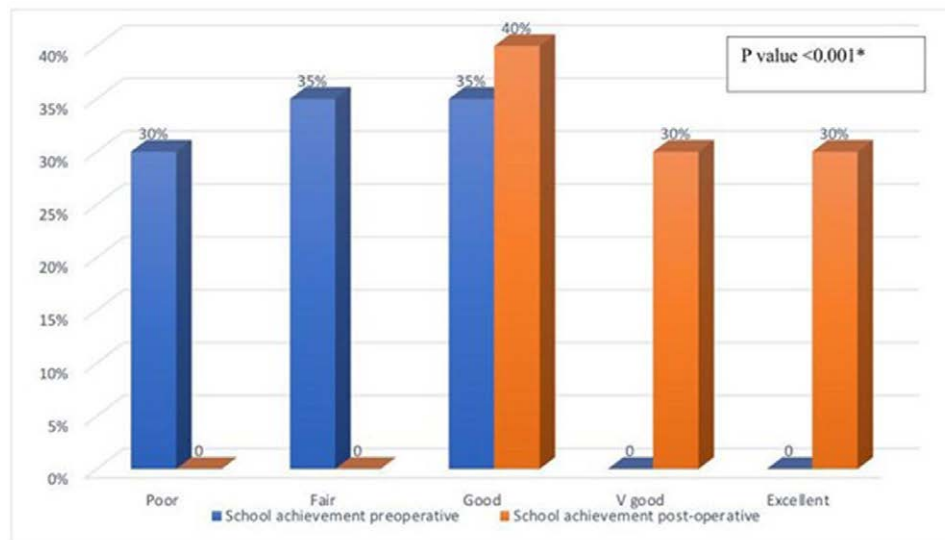


Fig. 3. Comparison between pre-and postoperative school achievement. Test of significance and Marginal test of homogeneity. *Significant *P* value.

level of patient satisfaction, except the SF-36, which was not found to be statistically significantly related using the Kruskal-Wallis test (Table 3). The self-assessment questionnaire, Rosenberg Self-Esteem Scale, and SF-36 show that all were significantly related to the level of patient satisfaction, except the SF-36, which was not found to be statistically significantly related using the Kruskal-Wallis test (Table 3).

DISCUSSION

Gynecomastia affects all ages. In various surveys, gynecomastia in teenagers is reported to have a significant lower quality of life and considerable physical and psychological impacts that last into adulthood, because they are subjected to social phobia, embarrassment, and teasing because of their large breast size.¹⁰

The current study identified several psychological domains affected by teenage gynecomastia. Surgical treatment has an obvious positive impact on these domains.

The “pull-through” technique was first described in 1996 by Morselli.²⁵ Morselli and Morellini in 2012²⁶ combined the pull-through technique with liposuction. Parenchymal excision was done by a scalpel or electrocautery through inframammary incisions. This technique is

used in the current study with some modifications, as previously described in the Elshahat and Lashin publication in 2020.¹⁸ We do not use a scalpel or electrocautery, and we use the same periareolar incision for pull-through of the gland instead of inframammary incisions.¹⁸

In the previous study by Fischer et al, in 2014,¹³ on 37 patients younger than 18 years, 11 patients underwent subcutaneous mastectomy, and 26 patients underwent subcutaneous mastectomy combined with liposuction, and the postoperative complication includes hematoma in two cases and recurrence of gynecomastia in two cases. Long-term complications included two cases with retracted nipples and one case with a hypertrophic scar. As regards patient satisfaction, four cases reported unsatisfactory results because of hypertrophic scar and contour deformity.¹³

In another study, Gabra et al, in 2004,²⁰ reported a high incidence of hematoma formation after drain insertion for subcutaneous mastectomy in 39 teenage males aged 13.3 years (range, 8±16 years). Early postoperative complications included three cases of hematoma, one case of seroma formation, and one case of wound infection because of a large dead space. Late complications included three cases with unequal breast sizes and one case with excess skin. Only four patients were not satisfied with the results.²⁰

Table 3. Association between Postoperative Patient Satisfaction and Different Scores Postoperatively

Scores	Postoperative Patient Satisfaction Level			Kruskal–Wallis Test	<i>P</i>
	Good, Mean ± SD	V. Good, Mean ± SD	Excellent Mean ± SD		
MSS postoperative	8±1	5±1	5±1	9.51	0.009*
Li et al self-assessment questionnaire postoperative	7±1	9±1	9±1	6.68	0.035*
Rosenberg Self-Esteem Scale 12 mo postoperative	32±3	34±1	38±4	7.01	0.03*
SF survey 12 mo postoperative	90±5	81±7	83±6	3.91	0.141*

*Significant *P* value.

In the current study, sharp dissection was only used superficially, while blunt dissection on the undersurface of the gland was performed, so no patients developed hematoma postoperatively, and there is no need to use drains. Early postoperative complications included seroma formation (n = 1), and late complications included mild breast asymmetry in 15% of patients (n = 3). MSS revealed that all patients showed the highest outcomes. Results were reported as “uniformly good to excellent” on a postoperative patient satisfaction scale in all patients.

In the current study, the focus on the patient’s perspective has been emphasized. The SF-36 that we used indicates the overall health state.²⁴ The studies that examined its reliability have reached 80%.^{27,28} Three previous studies also used the same form for gynecomastia surgery. The first study by Kasielska-Trojan and Antoszewski in 2017²⁹ found a statistically significant improvement in many domains and found a statistically significant increase in quality of life after surgery. The second study by Davanço et al in 2009¹⁴ reported the same results, except for limitations due to physical and emotional aspects, and limitations due to pain, which showed no improvement. A third study by Laituria et al,³⁰ in 2010, found that patients with gynecomastia given the SF-36 showed marked decrease in quality of life when compared with controls.

This was in accordance with the results of the current study, as we used the SF-36 and compared the results at 1 month preoperative and 12 months postoperative, finding remarkably higher quality of life scores postoperatively, with highly statistically significant difference. Other tools for assessment were previously used other than the SF-36, such as the CSQ-9³¹ used in the Fricke et al study in 2017³² and the simple 1–10 scale used in the Brafa et al study in 2011.³³ In both the Kasielska et al study in 2011³⁴ and Li et al study in 2012,¹⁵ the authors used questionnaires invented by themselves. Studies that used the validated SF-36 are reported to be the most informative when comparing results, as mentioned in a previous study.¹⁷

“Although gynecomastia of puberty is a common condition, affecting approximately 50% of mid-pubertal boys, in more than 90% of cases, it resolves spontaneously within 24 months.”³⁵

CONCLUSIONS

Surgical correction of teenage gynecomastia is beneficial for different psychosocial aspects. Pull-through delivery of the mammary gland combined with liposuction is a valid procedure for correction of teenage gynecomastia that guarantees satisfactory aesthetic results. This minimal scar technique improves the patients’ quality of life and showed a significant decrease in psychosocial burden, better school achievement, and better self-esteem.

Eman Nagy Mohamed, MD

Department of Plastic, Burn, and Maxillofacial Surgery
Faculty of Medicine
Ain Shams University
Eldemerdash Hospital
56 Ramsis Street, Abbassia
Cairo, Egypt
e-mail: e.nagy@hotmail.com

DISCLOSURE

The authors declare that they have no conflict of interest and have no commercial or financial interest to declare in relation to the content of this article.

PATIENT CONSENT STATEMENT

The patients signed an informed consent form.

STATEMENT OF CONFORMITY

All procedures performed in the current study were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards.

REFERENCES

- Braunstein GD. Gynecomastia. *N Engl J Med.* 1993;328:490–495.
- Nuttall FQ. Gynecomastia as a physical finding in normal men. *J Clin Endocrinol Metab.* 1979;48:338–340.
- Nydick M, Bustos J, Dale JH, et al. Gynecomastia in adolescent boys. *JAMA.* 1961;178:449–454.
- Lazala C, Saenger P. Pubertal gynecomastia. *J Pediatr Endocrinol Metab.* 2002;15:553–560.
- Brandt ML, et al. Disorders of the breast. In Grosfeld JL, ed. *Pediatric Surgery.* Mosby - Elsevier: Philadelphia, PA: 2006:892–893.
- Miranda EP, Mathes SJ, et al. Congenital defects of the skin, connective tissue, muscles, tendons, and hands. In Grosfeld JL, ed. *Pediatric Surgery.* Mosby - Elsevier: Philadelphia, PA: 2006:2066–2077.
- Lemaine V, Cayci C, Simmons PS, et al. Gynecomastia in adolescent males. *Semin Plast Surg.* 2013;27:56–61.
- Braunstein GD. Diagnosis and treatment of gynecomastia. *Hosp Pract (Off Ed).* 1993;28:37–46.
- Treves N. Gynecomastia; the origins of mammary swelling in the male: an analysis of 406 patients with breast hypertrophy, 525 with testicular tumors, and 13 with adrenal neoplasms. *Cancer.* 1958;11:1083–1102.
- Nuzzi LC, Cerrato FE, Erickson CR, et al. Psychosocial impact of adolescent gynecomastia: a prospective case-control study. *Plast Reconstr Surg.* 2013;131:890–896.
- Simon BE, Hoffman S, Kahn S. Classification and surgical correction of gynecomastia. *Plast Reconstr Surg.* 1973;51:48–52.
- Thorne CHM, Grabb WC, Beasley RW, eds. *Grabb and Smith’s Plastic Surgery.* New York, NY: Wolters Kluwer Health/Lippincott Williams & Wilkins; 2007.
- Fischer S, Hirsch T, Hirche C, et al. Surgical treatment of primary gynecomastia in children and adolescents. *Pediatr Surg Int.* 2014;30:641–647.
- Davanço RAS, Sabino Neto M, Garcia EB, et al. Quality of life in the surgical treatment of gynecomastia. *Aesthetic Plast Surg.* 2009;33:514–517.
- Li CC, Fu JP, Chang SC, et al. Surgical treatment of gynecomastia: complications and outcomes. *Ann Plast Surg.* 2012;69:510–515.
- Schonfeld WA. Gynecomastia in adolescence. Personality effects. *Arch Gen Psychiatry.* 1961;5:46–54.
- Sollie M. Management of gynecomastia—changes in psychological aspects after surgery—a systematic review. *Gland Surg.* 2018;7:S70–S76.
- Elshahat A, Lashin R. Comparative study between reconstruction of grade III gynecomastia in single stage versus two stage reconstruction. *Egypt, J Plast Reconstr Surg.* 2020;44:69–81.

19. Beckenstein MS, Windle BH, Stroup RT. Anatomical parameters for nipple position and areolar diameter in males. *Ann Plast Surg.* 1996;36:33–36.
20. Gabra HO, Morabito A, Bianchi A, et al. Gynaecomastia in the adolescent: a surgically relevant condition. *Eur J Pediatr Surg.* 2004;14:3–6.
21. Beausang E, Floyd H, Dunn KW, et al. A new quantitative scale for clinical scar assessment. *Plast Reconstr Surg.* 1998;102:1954–1961.
22. Rosenberg, M. *Society and The Adolescent Self-Image.* Princeton, NJ: Princeton University Press; 1965.
23. Ciarrochi J, Heaven PCL, Fiona D. The impact of hope, self-esteem, and attributional style on adolescents' school grades and emotional well-being: a longitudinal study. *J Res Pers.* 2007;41:1161–1178.
24. Ware JE, Sherbourne CD. The MOS 36-Item Short-Form Health Survey (SF-36): I. Conceptual framework and item selection. *Med Care.* 1992;30:473–483. PMID: 1593914
25. Morselli PG. "Pull-through": a new technique for breast reduction in gynecomastia. *Plast Reconstr Surg.* 1996;97:450–454.
26. Morselli PG, Morellini A. Breast reshaping in gynecomastia by the "pull-through technique": considerations after 15 years. *Eur J Plast Surg.* 2012;35:365–371.
27. McHorney CA, Ware JE, Lu JFR, et al. The MOS 36-item short-form health survey (SF-36): III. Tests of data quality, scaling assumptions and reliability across diverse patient groups. *Med Care.* 1994;32:40–66.
28. Ware JE, Snow KK, Kosinski M, Gandek B. *SF-36 Health Survey Manual and Interpretation Guide.* Boston, MA: New England Medical Center, The Health Institute; 1993.
29. Kasielska-Trojan A, Antoszewski B. Gynecomastia surgery-impact on life quality: a prospective case-control study. *Ann Plast Surg.* 2017;78:264–268.
30. Laituria CA, Gareya CL, Ostliea DJ, et al. Treatment of adolescent gynecomastia. *J Pediatr Surg.* 2010;45:650–654.
31. Baker R. Development of a questionnaire to assess patients' satisfaction with consultations in general practice. *Br J Gen Pract.* 1990;40:487–490.
32. Fricke A, Lehner GM, Stark GB, et al. Long-term follow-up of recurrence and patient satisfaction after surgical treatment of gynecomastia. *Aesthetic Plast Surg.* 2017;41:491–498.
33. Brafa A, Campana M, Grimaldi L, et al. Management of gynecomastia: an outcome analysis in a multicentric study. *Minerva Chir.* 2011;66:375–384.
34. Kasielska A, Antoszewski B. Effect of operative treatment on psychosocial problems of men with gynecomastia. *Pol Przegl Chir.* 2011;83:614–621.
35. Kanakis GA, Nordcap L, Bang AK, et al. EAA clinical practice guidelines-gynecomastia evaluation and management. *Andrology.* 2019;7:778–793.