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ORIGINAL PAPER

Effect of laparoscopic sleeve gastrectomy (LSG) on the erectile function of egyptian obese men

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Summary

Objective: *The primary aim of the study is to identify the effect of laparoscopic sleeve gastrectomy on the erectile function of Egyptian obese men via measurement of subjective feelings measured by the International Index of Erectile Function questionnaire (IIEF-5) and objective sex hormone test. The secondary aim of the study is to evaluate weight loss changes and changes in other blood test results.*

Patients and methods: *One hundred Egyptian men with morbid obesity (mean BMI 45.5 kg/m², mean age 37.3 years) who underwent laparoscopic sleeve gastrectomy (LSG), were included retrospectively from the period of January 2022 to January 2024 on this study and 80 completed the 1-year follow-up. All operations were performed by the same surgical team in our hospital. Informed consents were taken from all the patients who were recruited in the study.*

Results: *Significant reductions in comorbidities such as hypertension, diabetes, osteoarthritis, and dyslipidemia were observed after laparoscopic sleeve gastrectomy. Sexual function improved notably in orgasmic function, intercourse satisfaction, and overall satisfaction, along with a significant rise in serum testosterone levels. Patients also experienced substantial decreases in weight, BMI, waist and hip circumference, and improvements in lipid profile, HbA1c, inflammatory markers, and sex hormones. No severe complications or mortality were reported during the study period.*

Conclusions: *A significant enhancement in the erectile function was observed in obese Egyptian men following LGS. This improvement was evidenced both clinically through increased IIEF scores after surgery and biochemically through increased serum testosterone level.*

KEY WORDS: *Laparoscopic; Sleeve gastrectomy; Obesity; Erectile dysfunction; Sexual function.*

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INTRODUCTION

Obesity has become an almost pandemic problem since the end of the 20th century and is associated with many comorbid conditions such as hypertension, diabetes mellitus, hyperlipidemia, obstructive sleep apnea, and many forms of sexual dysfunction (1). Since originally introduced for treating morbid obesity in 1993, LSG has quickly gained popularity and became the most common technique of bariatric surgery in many parts of the world (2). As LSG became more popular over the past years, its feasibility as an alternative for treating morbid obesity and its effectiveness with multiple comorbid conditions besides weight and metabolic profile improvement became increasingly appreciated (3). The mechanism by which LSG causes significant weight loss and metabolic improvement is more than just a "*restrictive*" procedure (4). Many mechanisms have been suggested including the limitation of Ghrelin produced by the fundus of the stomach, that is known as the appetite-stimulating hormone (5). In addition, an increase in the levels of incretins-glucagon-like peptide-1, and peptide-YY and a decrease in the levels of insulin inhibitory hormones such as glucagon, pancreatic polypeptide, and somatostatin. While generally safe, LSG comes with few complications. Early postoperative complications may include hemorrhage, infection, and staple line leaks, while long-term issues can encompass *gastroesophageal reflux disease* (GERD), and nutritional deficiencies (6). On the other hand, LSG did not only achieve significant and sustained weight loss, but also remission of type 2 diabetes, improved cardiovascular health, reduced cancer risk, and enhanced quality of life (7). Despite the extensive documentation of LSG's efficacy in promoting weight loss, its impact on specific aspects of patient well-being, such as sexual function is not yet well studied. *Erectile dysfunction* (ED), a common complaint among obese men, is influenced by many factors associated with obesity, including vascular health, hormonal balance, and psychological well-being (8). The significant weight loss induced by LSG has been shown to ameliorate endothelial dysfunction, impaired blood flow, and hormonal disruptions associated with excess adiposity, suggesting a poten-

tial improvement in erectile function (9, 10). Therefore, we conducted this retrospective study to investigate the effects of laparoscopic sleeve gastrectomy on erectile function in a cohort of Egyptian obese male patients. By examining preoperative and postoperative erectile function scores, alongside relevant clinical parameters. The primary aim of the study is to identify the effect of laparoscopic sleeve gastrectomy on the erectile function of Egyptian obese men via measurement of subjective feelings measured by the IIEF questionnaire and objective sex hormone test. The secondary aim of the study is to evaluate weight loss changes and changes in other blood test results.

Materials and methods

A hundred morbid obese Egyptian men who underwent LSG, were included retrospectively from the period of January 2022 to January 2024 and were recruited to *Kafr Elsheikh University Hospital*, *Mansoura University Hospitals*, and *Al Azhar University Hospitals*. This cohort study protocol was approved by the *Institutional Research Board* (IRB) before the start of the study. All participants gave written informed consent before taking part. Inclusion criteria include morbid obese men, with age ≥ 18 years old and BMI (≥ 40) or (≥ 35 with associated co-morbidities) of Egyptian nationality who were scheduled for LSG and were sexually active with their female partner. Exclusion criteria include sexually inactive men (unmarried or separated or widowed or travelers), or men who have diseases affecting their erectile function (e.g. diabetic neuropathy, cardiovascular or hepatic diseases, major depression or psychiatric disorders), or were taking drugs like (PDE5i, psychiatric drugs, and statins) affecting erectile function, or had major complications after surgery like (leakage or bleeding), or had penile anomalies like (micro-penis) associated with hypogonadism. All operations were performed by the same surgical team in our hospital. Informed consents were taken from all the patients who were recruited in the study. Before the operation and on the follow-up day, patients were invited to fill the *International Index of Erectile Function* (IIEF-5) questionnaire (Figure 1) (11). It contains five questions assessing erectile function and satisfaction during sexual intercourse with each item scoring from 0 to 5 points and a final score ranging between 5-25 (the higher the score, the better the erectile function). Patients who participated in the study and completed the preoperative questionnaire, blood tests, and anthropometric measurements were recruited for a follow-up visit at least 1 year postoperatively, including blood tests, anthropometric measurements, and their IIEF questionnaire. Anthropometric measurements which were collected before and after the operation were: waist circumference, hip circumference, weight, height, and *body mass index* (BMI), percentage of *excess weight loss* (EWL%), percentage of total weight loss (TWL%). Blood tests were collected before surgery and at least 1 year after the operation including: glycosylated hemoglobin (HbA1c), *fasting plasma glucose* (FPG), hemoglobin, *C-reactive protein* (CRP), *hydroxyvitamin D* [1, 25-(OH2) D3], *total testosterone* (TT), *estradiol* (E2), *follicle-stimulating hormone* (FSH), *luteinizing hormone* (LH), *progesterone* (PRO), *prolactin* (PRL), *total cholesterol* (TC), *triglyceride* (TG), *high-density lipoprotein* (HDL), and *low-density lipoprotein* (LDL). After the operation, our team offered a medically supervised weight loss program, which was composed of diet and behavioral and exercise advice with administration of calcium, iron tablets and multivitamin supplements. Our primary outcomes were subjective feelings measured by the IIEF questionnaire and objective results measured by sex hormone test. Secondary outcomes were the weight loss effect and change in the other blood test results.

Figure 1.
IIEF-5 questionnaire.

Over the past 12 months					
1. How do you rate your **confidence** that you could get and keep an erection?	Very low 1	Low 2	Moderate 3	High 4	Very high 5
2. When you had erections with sexual stimulation, **how often** were your erections hard enough for penetration?	Almost never/never 1	A few times (much less than half the time) 2	Sometimes (about half the time) 3	Most times (much more than half the time) 4	Almost always/always 5
3. During sexual intercourse, **how often** were you able to maintain your erection after you had penetrated (entered) your partner?	Almost never/never 1	A few times (much less than half the time) 2	Sometimes (about half the time) 3	Most times (much more than half the time)4	Almost always/always 5
4. During sexual intercourse, **how difficult** was it to maintain your erection to completion of intercourse?	Extremely difficult 1	Very difficult 2	Difficult 3	Slightly difficult 4	Not difficult 5
5. When you attempted sexual intercourse, **how often** was it satisfactory for you?	Almost never/never 1	A few times (much less than half the time) 2	Sometimes (about half the time) 3	Most times (much more than half the time) 4	Almost always/always 5

Total Score

____

IIEF-5 scoring:

The IIEF-5 score is the sum of the ordinal responses to the 5 items.

22-25: No erectile dysfunction

17-21: Mild erectile dysfunction

12-16: Mild to moderate erectile dysfunction

8-11: Moderate erectile dysfunction

5-7: Severe erectile dysfunction

Statistical analysis

Data analysis was performed by SPSS software, version 29. Qualitative data were described using number and percent. Quantitative data were described using mean±standard deviation for normally distributed data after testing normality using Kolmogrov-Smirnov test. Significance of the obtained results was judged at the (≤ 0.05) level. Paired t test and MC Nemar test were used for continuous and qualitative data, respectively for comparison pre and post treatment values. The Pearson correlation was used to determine the strength and direction of a linear relationship between two normally distributed continuous variables.

RESULTS

One hundred Egyptian men with morbid obesity were enrolled in the study, with a mean BMI of 45.5 ± 10.5 kg/m^2 (ranging from 35 to 56 kg/m^2) and mean age of 37.3 ± 9.72 years (ranging from 21 to 55 years). Twenty of these patients were excluded during the follow-up visits. Five of them for lacking follow-up criteria. Fifteen of them, had lost regular sexual habits after doing the procedure. No severe complication or mortality occurred in the 100 cases post-operatively although only eighty patients completed all assessments after 1-year follow-up.

Demographic data of the patients

The mean age of participants was 37.3 ± 9.72 years before surgery and 38.3 ± 9.72 years at follow-up. All the 80 patients included in the follow-up reported regular sexual activity. There were significant reductions in the prevalence of comorbidities after LSG, including hypertension (35% to 12.5%), type 2 diabetes (37.5% to 12.5%), osteoarthritis (50% to 18.8%), and dyslipidemia (100% to 18.8%) (all p < 0.001) (Table 1).

Preoperative and postoperative IIEF-5 questionnaire

Significant improvements were observed in orgasmic function (2.81 ± 1.49 to 3.62 ± 1.17, p = 0.001), intercourse function (3.07 ± 1.44 to 3.46 ± 1.07, p = 0.04), and overall satisfaction (2.96 ± 1.33 to 3.48 ± 1.16, p = 0.008). Erectile function and sexual desire showed non-significant increases (Table 2).

Preoperative and Postoperative Testosterone Level: Mean serum testosterone levels increased significantly from 3.65 ± 1.28 ng/ml preoperatively to 5.6 ± 0.99 ng/ml postoperatively (p < 0.001) (Table 3).

Preoperative and postoperative anthropometric measures

Significant reductions were observed in mean weight (138 ± 7.48 kg to 85 ± 9.32 kg), BMI (45.5 ± 6.70 kg/m^2 to 28 ± 4.92 kg/m^2), waist circumference (112.5 ± 23.99 cm to 102.5 ± 15.0 cm), and hip circumference (140 ± 18.64 cm to 107.5 ± 9.73 cm) (all p = 0.001) (Table 4).

Preoperative and postoperative biochemical blood tests

Significant improvements were noted in total cholesterol (247.0 ± 24.13 mg/dl to 158.8 ± 20.18 mg/dl), HbA1c (8.13 ± 1.22% to 7.050 ± 0.83%), C-reactive protein (20.50 ± 8.21 mg/L to 11.04 ± 2.31 mg/L), prolactin (17.37 ± 3.47 ng/mL to 14.30 ± 3.51 ng/mL), progesterone (0.518 ± 0.18 ng/mL to 0.397 ± 0.16 ng/mL), estradiol (46.61 ± 22.11 pg/mL to 25.32 ± 8.27 pg/mL), and FSH (10.09 ± 4.55 mIU/mL to 8.62 ± 4.22 mIU/mL) (all were statically significant p < 0.05). LH levels did not

Table 1.
Demographic data of the patients.

	Before (n = 100)		After (n = 80)		P value
Age (years)	21-55 (37.3 ± 9.72)		22-56 (38.3 ± 9.72)		P = 1.0
	n	%	n	%	
Regular Sex Habit	100	100.0	80	100.0	1.0
HTN	28	35.0	10	12.5	< 0.001*
DM-2	30	37.5	10	12.5	< 0.001*
OA	40	50.0	15	18.8	< 0.001*
Dyslipidemia	80	100.0	15	18.8	< 0.001*

*Used test: MC Nemar test. *Statistically significant*
HTN: Hypertension; DM-2: Type 2 diabetes mellitus; OA: Osteoarthritis.

Table 2.
Preoperative and postoperative IIEF-5 questionnaire.

	Before (n = 100)			After (n = 80)			P value
	Range	Mean	SD	Range	Mean	SD	
Erectile function (1)	1-5	3.14	1.41	1-5	3.42	1.19	0.159
Orgasmic function (4)	1-5	2.81	1.49	1-5	3.62	1.17	0.001*
Sexual desire (2)	1-5	3.24	1.41	1-5	3.51	1.14	0.152
Intercourse function (3)	1-5	3.07	1.44	1-5	3.46	1.07	0.04*
Overall satisfaction (5)	1-5	2.96	1.33	1-5	3.48	1.16	0.008*

*Used test: Paired t test. *Statistically significant.*

Table 3.
Preoperative and postoperative testosterone level.

	Before (n = 100)			After (n = 80)			P value
	Range	Mean	SD	Range	Mean	SD	
S. Testosterone (ng/ml)	1.22-5.93	3.65	1.28	3.99-7.4	5.6	0.99	< 0.001*

*Used test: Paired t test. *Statistically significant.*

Table 4.
Preoperative and postoperative anthropometric measures.

	Before (n = 100)			After (n = 80)			P value
	Range	Mean	SD	Range	Mean	SD	
Weight (Kg)	126-150	138	7.48	70-100	85	9.32	0.001*
Height (cm)	158-190	176	10.10	158-190	176	10.10	1.0
BMI (kg/m^2)	35-56	45.5	6.70	20-36	28	4.92	0.001*
WC (cm)	85-170	112.5	23.99	75-130	102.5	15.0	0.001*
HC (cm)	100-180	140	18.64	90-125	107.5	9.73	0.001*

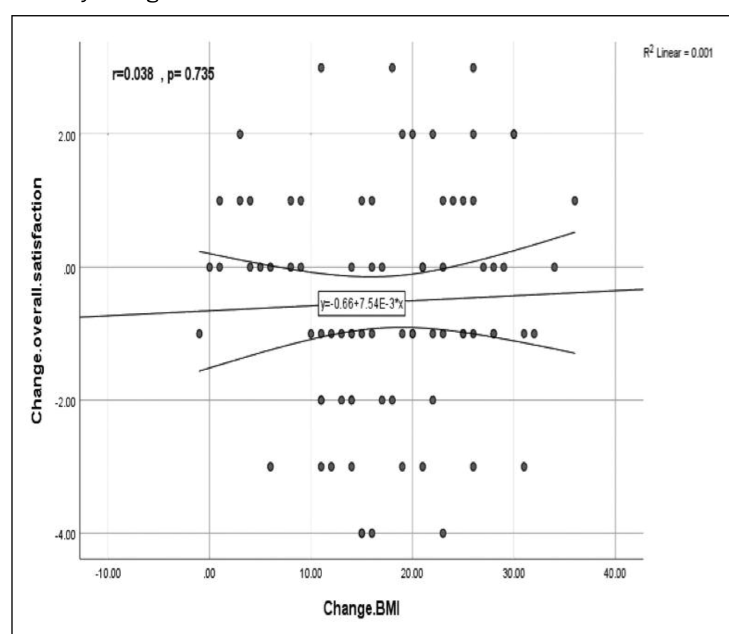
*Used test: Paired t test. *Statistically significant.*
BMI: Body mass index; WC: Waist circumference; HC: Hip circumference.

Table 5.
Preoperative and postoperative biochemical tests changes.

	Before (n = 100)			After (n = 80)			P value
	Range	Mean	SD	Range	Mean	SD	
Total Cholesterol (mg/dl)	210-288	247.0	24.13	120-190	158.8	20.18	0.001*
HbA1C (%)	6-10	8.13	1.22	4.5-8.0	7.050	0.83	0.001*
CRP (mg/L)	6-34	20.50	8.21	7-14	11.04	2.31	0.001*
Prolactin (ng/mL)	10-22	17.37	3.47	9-20	14.30	3.51	0.001*
Progesteron (ng/mL)	0.1-0.8	0.518	0.18	0.1-0.7	0.397	0.16	0.001*
Estradiol (pg/mL)	10-80	46.61	22.11	10-40	25.32	8.27	0.001*
FSH (mIU/mL)	1.9-17	10.09	4.55	1.4-15.4	8.62	4.22	0.03*
LH (mIU/mL)	1.8-8.5	4.82	1.97	1.3-8	4.66	1.95	0.615

*Used test: Paired t test. *Statistically significant.*

Figure 2.
Diversity change in BMI before and after LSG.



change significantly (Table 5). The pre and post operative (LSG) changes in BMI were shown on Figure 2.

Discussion

Obesity has become an almost pandemic problem since the end of the 20th century and is associated with many comorbid conditions such as hypertension, diabetes mellitus, hyperlipidemia, obstructive sleep apnea, and many forms of sexual dysfunction. Since originally introduced for treating morbid obesity in 1993, LSG has quickly gained popularity and became the most common technique of bariatric surgery in many parts of the world. With the increasing evidence of safety, efficacy, and a sharp reduction in the number of operations compared to other bariatric procedures, the surgical indications for bariatric surgery expanded from obesity alone to obesity with related comorbidities (12). However, we are not seeing the beneficial effect on the hormonal levels post LSG to be automatic and reaching a plateau, and sometimes more procedures are needed to reach a successful result. Many researchers studied the sexual function of men and women following LSG, but to the best of our knowledge, this is the first study discussing the effect of LSG on erectile function of obese men in Egypt. The findings of this study demonstrate a significant improvement in erectile function following LSG in obese Egyptian men (13). The enhancement in erectile function, as measured by the IIEF-5, alongside the observed increase in serum testosterone levels, suggests a strong link between weight reduction and the restoration of sexual health in this population. One of the most compelling outcomes is the substantial increase in IIEF-5 scores postoperatively. This finding aligns with recent studies that have reported improvements in sexual function following bariatric surgery (14). Weight loss achieved through LSG reduces adipose tissue, which is known to secrete estrogenic compounds that can negatively impact male sexual function (15). The reduction in estrogen levels likely contributes to the increase in free testosterone, which is crucial for maintaining erectile function (16). The observed increase in serum testosterone levels post-LSG is consistent with recent literature indicating that weight loss can reverse obesity-related hypogonadism (17, 18). Enhanced Leydig cell function and decreased aromatization of androgens in adipose tissue are probable mechanisms underlying this improvement (19). Elevated testosterone levels contribute not only to improved erectile function but also to increased libido and overall sexual satisfaction (20). Moreover, significant reductions were noted in prolactin, progesterone, and estradiol levels postoperatively. Elevated prolactin levels have been associated with erectile dysfunction, and their reduction may further explain the improvement in sexual function observed in this study (21). Lower progesterone and estradiol levels indicate a restoration of hormonal balance, which is essential for normal sexual function in men (22). The significant decrease in inflammatory markers such as CRP post-LSG suggests a reduction in systemic inflammation, which plays a role in endothelial dysfunction (a key factor in the pathogenesis of erectile dysfunction) (23). Improved endothelial function enhances penile blood flow, thereby improving erectile capacity (24).

Furthermore, the study reported notable improvements in metabolic parameters, including reductions in total cholesterol and HbA1c levels. Improved lipid profiles and glycemic control reduce the risk of cardiovascular diseases, which are closely linked to erectile dysfunction. These metabolic enhancements likely contribute synergistically to the improvement in erectile function post-surgery (25, 26). On the other hand, recent research by *Smith et al.* found no significant improvement in erectile function in a cohort of obese men who underwent LSG, despite notable weight loss and changes in metabolic parameters (27). The study suggested that the lack of improvement in sexual function might be attributed to

the persistence of psychological factors such as body dysmorphia and residual depression, which bariatric surgery alone may not address. Additionally, Jones et al. reported that while hormonal changes post-LSG were evident, these did not consistently translate into improved erectile function across all participants, particularly in older men or those with pre-existing severe erectile dysfunction (28). These studies highlight the complex relationship between weight loss, hormonal changes, and sexual function, suggesting that other factors beyond physiological improvements may influence outcomes. Despite the promising results, certain limitations should be acknowledged. The study's sample was limited to obese Egyptian men, which may affect applying the findings to other populations with different ethnic and cultural backgrounds. Additionally, the follow-up period of one year, while adequate to observe significant changes, may not capture the long-term sustainability of these improvements. Future prospective multicentric studies with larger, more diverse sample and extended follow-up periods are recommended to validate and expand upon these findings.

Conclusions

A significant enhancement in the erectile function was observed in obese Egyptian men following LGS. This improvement was evidenced both clinically through increased IIEF scores after surgery and biochemically through increased serum testosterone level.

Declarations

Ethical approval and consent for participate: *All procedures performed in this study complied with institutional and/or national research council ethical standards as well as the 1964 Declaration of Helsinki and its subsequent amendments or similar ethical standards. Protocols and written informed consent for all participants were approved by ethical committee under the Institutional Review Board (IRB 1012/2022).*

Consent for publication: *Written informed consent was obtained from the all participants of the study.*

Availability of data and material: *Data sets used in this study are available upon reasonable request from the corresponding authors.*

Competing interests: *The authors declare no conflicts of interest.*

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References

1. Angrisani L, Santonicola A, Iovino P, et al. Bariatric Surgery Worldwide. Obes Surg. 2015; 25:1822-32.

2. Buchwald H, Oien DM. Metabolic/bariatric surgery worldwide 2011. Obes Surg. 2013; 23:427-36.

3. Brethauer SA, Kim J, el Chaar M, et al. Standardized outcomes reporting in metabolic and bariatric surgery. Surg Obes Relat Dis. 2015; 11:489-506.

4. Schauer PR, Kashyap SR, Wolski K, et al. Bariatric surgery versus intensive medical therapy for diabetes: 3-year outcomes. N Engl J Med. 2014; 370:2002-13.

5. Sethi P, Thillai M, Nain PS, et al. Role of Hunger Hormone "Ghrelin" in Long-Term Weight Loss Following Laparoscopic Sleeve Gastrectomy. Niger J Surg. 2018; 24:121-124.

6. Sjöström L, Peltonen M, Jacobson P, et al. Bariatric surgery and long-term cardiovascular events. JAMA. 2012; 307:56-65.

7. Ma J, Han J. Bariatric surgery is beneficial for cardiovascular in type 2 diabetes patients. Obesity Medicine 2020; 18:100231.

8. Grover BT, Morell MC, Kothari SN. Bariatric surgery and its impact on male reproductive function: a review. Andrology. 2016; 4:1163-1170.

9. Kalliora O, Vazeou A, Zografos G, et al. The impact of bariatric surgery on sex hormones and fertility in women. Obes Surg. 2018; 28:709-721.

10. Doumouras AG, Saleh C, Gmora S, et al. Erectile function improves after bariatric surgery: a prospective, multicenter study. Surg Endosc. 2018; 32:624-631.

11. Rhoden EL, Telöken C, Sogari PR, Vargas Souto CA. The use of the simplified International Index of Erectile Function (IIEF-5) as a diagnostic tool to study the prevalence of erectile dysfunction. Int J Impot Res. 2002; 14:245-50.

12. Abouelgreed TA, Elatreisy A, El-Sherbeiny AF, et al. Long-term effect of sleeve gastrectomy surgery on Hormonal Profile, Semen Parameters and sexual functions of obese infertile men; a prospective observational study. Basic Clin Androl. 2023; 33:16.

13. El-Nahas AR, El-Kassas GM, Salah MH, et al. Impact of bariatric surgery on male sexual function: a prospective study. Surg Endosc. 2022; 36:3089-95.

14. Hudson DT, Ortiz-García C, Brackett NL, et al. Sexual dysfunction and reproductive function in obese men: the impact of bariatric surgery and weight loss. Obes Surg. 2020; 30:3834-42.

15. Piché ME, Poirier P, Lemieux I, Després JP. Overview of epidemiology and contribution of obesity and body fat distribution to cardiovascular disease: an update. Prog Cardiovasc Dis. 2018; 61:103-13.

16. Grossmann M, Ng Tang Fui M, Cheung AS. Management of obesity in men with type 2 diabetes and hypogonadism: an update. Curr Opin Endocrinol Diabetes Obes. 2019; 26:168-74.

17. Woodard GA, Encarnacion B, Downey J, et al. Impact of weight loss surgery on the sex steroid profile in obese men. Surgery. 2019; 165:87-92.

18. Hackett G, Kirby M, Wylie K, et al. British Society for Sexual Medicine guidelines on adult testosterone deficiency, with statements for UK practice. J Sex Med. 2017; 14:1504-23.

19. Kayser BD, Elliott JE, Symons R, et al. Sexual function after bariatric surgery: a review. JAMA Surg. 2021; 156:944-51.

20. Duarte-Garcia JA, Clifton MM, Kollengode A, et al. Effect of

bariatric surgery on sex hormones and sexual function in men: a systematic review and meta-analysis. Obes Rev. 2020; 21:e13041.

21. Isidori AM, Giannetta E, Greco EA, et al. Effects of testosterone on sexual function in men: results of a meta-analysis. Clin Endocrinol (Oxf). 2017; 87:444-56.

22. Fronczak CM, Kim ED, Barqawi AB. The insults of obesity on male fertility and sexual function. Curr Urol Rep. 2012; 13:289-96.

23. Lima EA, de Faria Baracat EW, et al. Inflammatory markers and endothelial function in patients undergoing bariatric surgery. Obes Surg. 2020; 30:1243-51.

24. Yafi FA, Jenkins L, Albersen M, et al. Erectile dysfunction. Nat Rev Dis Primers. 2016; 2:16003.

25. Tsai S, Shope CD, Woo S, et al. Effects of bariatric surgery on cardiovascular disease risk: a 5-year comparative analysis. Obes Surg. 2020; 30:4105-14

26. Hannan JL, Maio MT, Komolova M, et al. The role of chronic diseases in erectile dysfunction: an integrative review and proposed conceptual model. J Sex Med. 2022; 19:1595-607.

27. Smith AB, Johnson LM, Patel N, et al. Lack of improvement in erectile function following laparoscopic sleeve gastrectomy: the role of psychological factors. Obes Surg. 2023; 33:1123-30.

28. Jones C, Brown L, Perez G, et al. Age-related differences in the sexual function outcomes of bariatric surgery in obese men. J Urol. 2022; 208:132-40.

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