sciendo

ARS Medica Tomitana - 2023; 1(29): pag. 68 - 74
doi: 10.2478/arsm-2023-0010

BEYOND WEIGHT LOSS: EXPLORING THE IMPACT OF BARIATRIC SURGERY ON OTOLARYNGOLOGICAL HEALTH

Andreea Hagi[1,2], Leonard Gurgas[1], Mihai Victor Lupascu[2]

[1] Faculty of Medicine, University "Ovidius" of Constanta
[2] Emergency Country Clinical Hospital "Sfantul Apostol Andrei" of Constanta

Leonard Gurgas
email: leonard.gurgas@365.univ-ovidius.ro

ABSTRACT

The prevalence of obesity is now one of the main concerns of public health worldwide. Obesity leads to various otolaryngological (ENT) problems by altering the immune system, studies are showing a positive correlation between obesity and common otolaryngological diseases. Following the studies carried out so far, it has been shown that bariatric surgery is currently the most effective and long-lasting treatment for severe obesity. Gastric bypass and other weight loss surgeries - known collectively as bariatric surgery - involve making changes to the digestive system to help the patient lose weight. The present study highlights significant weight loss between approximately two years and six years, and the highest percentage is of patients who have lost more than 50 kg through bariatric surgery, and aims to explore the benefits or risks of bariatric surgery in the ENT field. The purpose of the research is to deepen and research the ENT manifestations following bariatric surgery.

Keywords: Obesity, bariatric surgery, ENT.

Introduction

The prevalence of obesity has increased a lot recently, and this is now one of the main concerns of public health worldwide. (1).

There is an association between otolaryngological (ENT) manifestations and obesity. It is suggested that, with obesity, children are prone to otorhinolaryngological diseases by affect the organs of the upper respiratory tract, mechanical disorders in the upper airways, otitis media with effusion, acute and recurrent, etc. Furthermore, childhood obesity is significantly correlated with obstructive sleep apnea and asthma (2). Obesity leads to various ENT problems by altering the immune system, studies are showing a positive correlation between obesity and common otolaryngological diseases (3). Obesity is also one of the diagnostic factors of metabolic syndrome, which is associated with the physiopathological characteristics of sudden sensorineural hearing loss (4). Moreover, the neck circumference showed associations, it is true, with poor results, with cardiovascular risk factors (5). The association of neck circumference with some cardiometabolic risk factors has already been demonstrated in children (6), and neck circumference measurement is already a simple and convenient screening measure to identify overweight and obese patients (7). Because

BMI was associated with the prevalence of posterior longitudinal ligament ossification, this may suggest that obesity is associated with the development of heterotopic ossification of the spinal ligaments (8). Continuing the discussion between ENT manifestations and obesity, it should be remembered that the association between obesity and chronic rhinosinusitis with nasal polyps was evaluated, demonstrating this association (9). Moreover, the different phenotypes of chronic rhinosinusitis show the importance of obesity, forcing its very careful evaluation (10). There are reports linking obesity with an increased prevalence of sinonasal disease, although not with increased severity of this disease (11). Even though there was no correlation between obesity and nasal volume assessment, obesity was significantly correlated with subjective nasal obstruction (12). The previously mentioned metabolic syndrome significantly increases nasal and parotid activity on blood basin scans, so there is increased nasal blood activity in patients with increased body mass indices (13). As can be seen, the comorbidities related to obesity are major, and the increase in its prevalence causes a proportional increase in the conditions associated with it. Substantially affecting vascular function, obesity also has an impact on the auditory system, and hearing impairment dramatically reduces the patient's quality of life (14). This is also the reason why we always warn that a high body fat index is related to the etiology of hearing loss in the elderly population (15). Otitis media is also a public health problem and some studies show that its increased incidence is correlated with obesity (16).

Following some studies, it has been shown that bariatric surgery is currently the most effective and long-lasting treatment for severe obesity (17). Gastric bypass and other weight loss surgeries - known collectively as bariatric surgery - involve making changes to the digestive system to help the patient lose weight. (18). These patients undergo many dramatic lifestyle changes (19), and the preoperative screening (20), carried out by a multidisciplinary team, has a very important role, both for the patient and for the operating team, it helps the doctor to identify patients who would benefit from additional investigations and procedures, before or after the intervention (21).

The purpose of this study is to deepen and research the ENT manifestations following bariatric surgery.

Material and Method

This study is both retrospective and prospective, being carried out on a group of 47 patients. All patients underwent bariatric surgery. The age of the people included in the study is between 20-70 years.

For the objective determination of the group of patients, we considered it necessary to establish inclusion and exclusion criteria, as follows:

Inclusion criteria

- Age over 19 years;
- BMI (body mass index) over 30 with type 2 diabetes difficult to control with medication;
- BMI (body mass index) over 35 and have serious health problems associated with obesity, such as high blood pressure, diabetes, gout and breathing problems, etc;
- BMI (body mass index) over 40. In the case of women, this means that the surplus should be about 35 kilograms, while men should have about 45 kilograms;
- Manifestations in the field of ENT;
- The possibility of evaluating the patient, at least 1 year;
- Bariatric surgery.

Exclusion criteria

- Gastroesophageal reflux disease without ENT manifestations;
- Patients with Barrett's esophagus in an advanced form, who can no longer benefit from medical/surgical treatment;

The data about the ENT manifestations that appear both before and after the surgical intervention were processed and analyzed statistically and then compared with those from the specialized literature.

For the processing of personal data as well as the photographing of the results of paraclinical investigations, the patient's consent was requested. Each person was informed of the exclusively scientific consequences of the

photographs taken.

47 patients who underwent bariatric and metabolic surgery between 2009 and 2022 were surveyed, the ratio of women/men being 10.75 - 91.48% women (43 women) and 8.52% men (4 men).

Results

Table 1 Socio-demographic distributions

Category	Male	Female
Genders	4 (8,52%)	43 (91,48%)
20 - 30 years	1 (25%)	7 (16,28%)
31 - 40 years	3 (75%)	18 (41,87%)
41 - 50 years	0 (0%)	7 (16,28%)
52 - 60 years	0 (0%)	10 (2,32%)
61 - 70 years	0 (0%)	1 (23,25%)
Urban	4 (8,51%)	37 (78,72%)
Rural	0 (0%)	6 (12,77%)
Work environment	Toxic	Non-toxic
	1 (2,12%)	46 (97,88%)

Table 1 shows that there are more women (43) than men (4) who resort to bariatric surgery in the present study, 91.48% versus 8.52%.

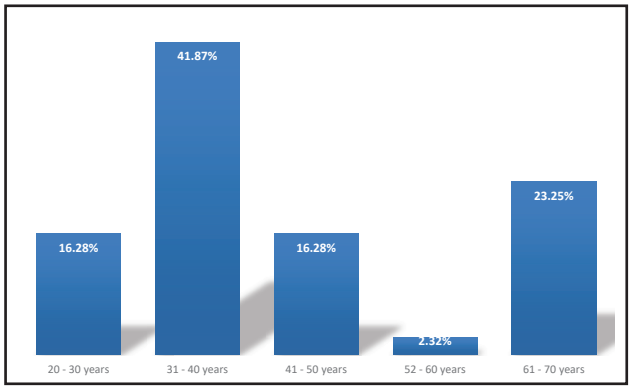


Figure 1 Female age distribution according to bariatric intervention

Regarding the distribution of cases by age group, it can also be seen from Figure 1 that there is a maximum between 31-40 years old, 18 cases of women who resorted to bariatric surgery (41.87%). And between 52-60 years several 10 cases resorted to surgery (23%).

People's environment is a very important factor in the pathology of gastroesophageal reflux disease. So of the 47 patients who applied for this intervention, 41 are part of the urban environment (37 women, 4 men) and the remaining 6 (being women) come from the countryside.

Out of the total number of patients who requested surgical intervention, 46 claim that they do not work in a toxic environment and one works in a toxic environment.

Table 2 Distribution of risk factors and type of surgical intervention

The type of surgery	
Gastric- sleeve	44 (93,62%)
Bypass	3 (6,38%)
Smokers/non-smokers	
Smokers before and after the intervention	20 (42,56%)
Smokers only before the intervention	5 (10,64%)
Smokers after the intervention	2(4,25%)
Non-smokers	20 (42,55%)
Alcohol consumption	
Consumes alcohol/ consumes occasionally	19 (40,42%)
Do not drink alcohol	28 (59,58 %)

Table 2 shows an important frequency of the type of Gastric-sleeve surgical intervention of 93.62% compared to bypass of only 6.38%.

Factors favoring the occurrence of reflux disease are smoking and drinking alcoholic beverages. Of the 47 patients, 20 stated that they smoked both before and after surgery (42.56%), 5 of them smoked only before surgery (10.64%) and 2 started smoking after surgery (4.25%). The remaining 20 have never smoked until now (42.55%).

Out of the total number of operated patients (47), 19 consume alcohol or only occasionally (40.42%), and 28 have never consumed alcohol (59.58%).

Table 3 presents the chronology of the loss of excess weight percentages, a loss that increases progressively, reaching a maximum between months 18 and 70. Most patients fall within the initial weight of 101-140 Kg. It is observed that 13 patients (27.66%) lost more than 50 Kg in weight.

Table Weight manifestations

Chronology of weight loss percentages	
3-25 months	35%
6-45 months	55%
12-65 months	70%
18-70 months	75%
Initial weight/ Number of patients	
85 – 100 Kg	9 (19.15 %)
101 – 120 Kg	17 (36.17 %)
121 – 140 Kg	16 (34.04 %)
> 141 Kg	5 (10.64 %)
Weight loss/Number of patients	
10 – 20 Kg	4 (8.52%)
21 – 30 Kg	7 (14.89 %)
31 – 40 Kg	11 (23.40 %)
41 – 50 Kg	12 (25.53 %)
> 50 Kg	13 (27.66 %)

Table 4 BRGE and other symptoms

BRGE	Present	Absent
Before the intervention	31 (65.95%)	16 (34.05%)
Only after the intervention	6 (12.77 %)	41 (87.23%)
Before and after the intervention	23 (48.93 %)	24 (51.07%)
Symptoms	Present	Absent
Reflux pharyngolaryngitis	5 (10.64%)	42 (89.36%)
Heartburn	20 (42.55%)	27 (57.45%)
Morning reflux/ sour taste in the morning	14 (29.78 %)	33 (70.22%)
Dry cough/ nocturnal dry cough	15 (31.91%)	32 (68.09%)
Hemaj	2 (4.25%)	45 (95.75%)
Sleep quality – sleep apnea	3 (6.38 %)	44 (93.62%)
Vocal fatigue	15 (31.91 %)	32 (68.09%)
Dysphonia	10 (21.28 %)	37 (78.72%)
Tubal dysfunction	1 (2.13 %)	46 (97.87%)
Lack of air during phonation	13 (27.66%)	34 (72.34%)

Regarding gastroesophageal reflux disease, 31 patients had GERD (65.95%) before the intervention and only six after the intervention (12.77%). 23 people kept these manifestations before and after bariatric surgery. The symptomatology is represented with a higher frequency by heartburn, in 20 patients, dry cough in 15 patients, vocal fatigue in 15 patients, and morning reflux/ acid taste in the morning, in 14 patients.

Discussions

The study reveals a majority (table I) of women who resort to bariatric surgery, compared to men who use this surgical method. Moreover, in the last decade, the number of men who used bariatric surgery continued to decrease compared to the number of women. This may also be caused by the complications caused by the increased severity of the disease and higher percentages of morbidity and mortality (22). However, women may have different motivations for which they turn to this type of surgery, one of them being the need to change their lifestyle along with losing weight and improving comorbidities (23).

There is a significant share of women in the 31-40 age group who have resorted to bariatric surgery. Moreover, weight loss due to bariatric surgery is less in older patients due to changes in metabolism. There are higher rates of remission of obesity-related comorbidities in younger patients compared to older people (24). However, some studies show that laparoscopy with sleeve gastrectomy in elderly patients is effective in terms of weight loss and improvement of comorbidities (25).

There is a preponderance of urban women who resort to this type of intervention, perhaps because urban patients are favored over rural ones (26)

Laparoscopic sleeve gastrectomy has a high frequency with other surgical interventions (laparoscopic gastric bypass) due to the technical ease to which is added the low risk of anatomical complications. However, there is emerging evidence for progressive gastroesophageal reflux disease after sleeve gastrectomy, as well as lower weight loss, evidence that could lead to a reevaluation of this surgical intervention in the future (27).

The present study shows a significant weight loss between about two years and six years, and the highest percentage is of patients who lost more than 50 Kg of weight through bariatric surgery, and this can lead to neuralgia of the superior laryngeal nerve (28). If significant weight loss is 50% (29, 30) the present study shows that this goal was achieved within the first 45 months (about 4 years).

This study shows that a fairly large percentage of patients are smokers who have kept this habit even after the studio operation. Studies show that after 30 days after the intervention, the results are significantly worse in smokers compared to non-smokers (29) in the sense of increasing postoperative complications. However, the effect of smoking on bariatric surgery outcomes is unclear (30).

The percentage of patients in this study who consume alcohol is slightly lower, but not insignificant than those who do not. Some of these may be also patients who replaced food addiction with a new addiction (alcohol) after the operation (31). There is no conclusive evidence that alcohol could lead to the reappearance of obesity (32), but the systemic effects of alcohol interact with local changes in the function of the salivary glands leading to a susceptibility to carcinogenic agents (33).

Obviously, after a certain period, weight loss is more evident, although re-surgery may be necessary after a certain number of years (34, 35). Some studies report that one-third of weight loss patients report ENT changes, for example, changes in voice quality (36). Other studies suggest that bariatric surgery may lead to symptoms of Eustachian tube dysfunction due to acute weight loss but also the consequent loss of peritubal fat (37).

It is known that esophageal motility disorders have a high frequency in the obese population, and this is also observed in the present study. Gastroesophageal reflux disease appears to be aggravated by bariatric surgery by affecting esophageal motility (38) but these symptoms can be improved depending on the type of laparoscopic gastrectomy used (for example with a sleeve) (39). Although not many people developed GERD in the present study, there is still concern that bariatric surgery leads to the development of this disease later on. (40).

The present study shows an important percentage of patients have dry cough symptoms. According to the results of epidemiological studies, obesity can be associated with chronic cough and obstructive sleep apnea can be involved in the development of chronic cough. (41). The rate of respiratory impairment from severe chronic cough after weight loss surgery is very high, so doctors must anticipate such potential complications after bariatric surgery (42, 43).

Conclusions

Obesity remains a major cause of illness and death, and bariatric surgery remains the only modality for substantial and sustained weight loss.

Although studies have shown inconsistencies regarding the various types of bariatric surgery and their effects on GERD manifestations, weight loss has been shown to significantly improve GERD symptoms.

The safety of such a surgical intervention is an important aspect, and following the study, a dramatic improvement in the quality of life after the surgical intervention is highlighted.

Following the parents' questionnaire, a maximum improvement in the quality of life was evident in the period 6-12 months postoperatively, but these deteriorated slightly 2 years postoperatively. Also during this period, the patient's weight stabilizes, if the indications and the hygienic-dietary regimen recommended by the surgeon and nutritionist are respected.

References

1. Hruby A, Hu FB. The Epidemiology of Obesity: A Big Picture. Pharmacoeconomics. 2015 Jul;33(7):673-89.
2. Krajewska Wojciechowska J, Krajewski W, Zatoński T. The Association Between ENT Diseases and Obesity in Pediatric Population: A Systemic Review of Current Knowledge. Ear Nose Throat J. 2019 Jun;98(5):E32-e43.
3. Saraf A, Manhas M, Manhas A, Kalsotra P. Obesity and ENT manifestations — a tertiary care centre study. The Egyptian Journal of Otolaryngology. 2023 2023/01/23;39(1):22.
4. Jung SY, Shim HS, Hah YM, Kim SH, Yeo SG. Association of Metabolic Syndrome With Sudden Sensorineural Hearing Loss. JAMA Otolaryngology–Head & Neck Surgery. 2018;144(4):308-14.
5. Tal S, Litovchik I, Klar MM, Maresky HS, Grysman N, Wiser I, et al. The association between neck adiposity and long-term

outcome. PLoS One. 2019;14(4):e0215538.
6. Kelishadi R, Heidari-Beni M, Qorbani M, Motamed-Gorji N, Motlagh ME, Ziaodini H, et al. Association between neck and wrist circumferences and cardiometabolic risk in children and adolescents: The CASPIAN-V study. Nutrition. 2017 Nov-Dec;43-44:32-8.
7. Qureshi NK, Hossain T, Hassan MI, Akter N, Rahman MM, Sultana MM, et al. Neck Circumference as a Marker of Overweight and Obesity and Cutoff Values for Bangladeshi Adults. Indian J Endocrinol Metab. 2017 Nov-Dec;21(6):803-8.
8. Endo T, Takahata M, Koike Y, Fujita R, Suzuki R, Hisada Y, et al. Association between obesity and ossification of spinal ligaments in 622 asymptomatic subjects: a cross-sectional study. J Bone Miner Metab. 2022 Mar;40(2):337-47.
9. Nam JS, Roh YH, Fahad WA, Noh HE, Ha JG, Yoon JH, et al. Association between obesity and chronic rhinosinusitis with nasal polyps: a national population-based study. BMJ Open. 2021 May 25;11(5):e047230.
10. Clarhed UKE, Schiöler L, Torén K, Fell AKM, Hellgren J. BMI as a risk factor for the development of chronic rhinosinusitis: a prospective population-based study. Eur Arch Otorhinolaryngol. 2022 Oct;279(10):4953-9.
11. Kanagalingam S, Shehab SS, Kaminsky DA, Wise RA, Lang JE, Dixon AE. Effect of obesity on sinonasal disease in asthma. J Asthma. 2018 May;55(5):525-31.
12. Rodrigues MM, Carvalho PHA, Gabrielli MFR, Lopes RN, Garcia Junior OA, Pereira Filho VA, et al. How obesity affects nasal function in obstructive sleep apnea: anatomic and volumetric parameters. Braz J Otorhinolaryngol. 2022 May-Jun;88(3):296-302.
13. Phillips WT, Issa NJ, Elhalwagi SB, Draeger HT, Schwartz JG, Gelfond JA. Nasal and Parotid Blood Pool Activity Is Significantly Correlated with Metabolic Syndrome Components and Sleep Apnea. Metab Syndr Relat Disord. 2022 Sep;20(7):395-404.
14. Dhanda N, Taheri S. A narrative review of obesity and hearing loss. Int J Obes (Lond). 2017 Jul;41(7):1066-73.
15. Croll PH, Voortman T, Vernooij MW, Baatenburg de Jong RJ, Lin FR, Rivadeneira F, et al. The association between obesity, diet quality and hearing loss in older adults. Aging (Albany NY). 2019 Jan 4;11(1):48-62.
16. Gavrilovici C, Spoială EL, Ivanov AV, Mocanu A, Ștreangă V, Alecsa MS, et al. Otitis Media and Obesity-An Unusual Relationship in Children. Healthcare (Basel). 2021 Apr 14;9(4).
17. Kissler HJ, Settmacher U. Bariatric surgery to treat obesity. Semin Nephrol. 2013 Jan;33(1):75-89.
18. Secretariat, MA. Bariatric surgery: an evidence-based analysis. Ont Health Technol Assess Ser. 2005;5(1):1-148.
19. Soroceanu RP, Timofte DV, Danila R, Timofeiov S, Livadariu R, Miler AA, et al. The Impact of Bariatric Surgery on Quality of Life in Patients with Obesity. J Clin Med. 2023 Jun 23;12(13).
20. Allotey J, Caposole M, Attia A, Coonan E, Noguera V, Lewis E, et al. GERD-screening before bariatric surgery: the predictive value of the GERD-HRQL questionnaire score compared with preoperative EGD findings. Surg Endosc. 2023 Sep 20.
21. Sall AR, Jones MW. Bariatric Surgery Preoperative Assessment. StatPearls. Treasure Island (FL): StatPearls Publishing, StatPearls Publishing LLC.; 2023.
22. Young MT, Phelan MJ, Nguyen NT. A Decade Analysis of Trends and Outcomes of Male vs Female Patients Who Underwent Bariatric Surgery. J Am Coll Surg. 2016 Mar;222(3):226-31.
23. Hult M, te Riele W, Fischer L, Röstad S, Orava K, Heikkinen T, et al. Women's Reasons to Seek Bariatric Surgery and Their Expectations on the Surgery Outcome — a Multicenter Study from Five European Countries. Obesity Surgery. 2022 2022/11/01;32(11):3722-31.
24. Pfefferkorn U, Hort S, Beluli M, La Vista M, Züger T. Weight Loss After Bariatric Surgery in Different Age Groups. Obesity Surgery. 2023 2023/04/01;33(4):1154-9.
25. Fernández-Ananín S, Ballester E, Gonzalo B, Codina C, Miñambres I, Pérez A, et al. Is Sleeve Gastrectomy as Effective in Older Patients as

in Younger Patients? A Comparative Analysis of Weight Loss, Related Comorbidities, and Medication Requirements. Obes Surg. 2022 Jun;32(6):1909-17.
26. Szeliga J, Kupczyk W, Kupczyk K, Chojnowski J, Jackowski M, Ponikowska I. Withdrawal from bariatric treatment – an analysis under various demographic conditions. Ann Agric Environ Med. 2016 2016;23(4):688-91.
27. Varvoglis DN, Lipman JN, Li L, Sanchez-Casalongue M, Zhou R, Duke MC, et al. Gastric Bypass Versus Sleeve Gastrectomy: Comparison of Patient Outcomes, Satisfaction, and Quality of Life in a Single-Center Experience. J Laparoendosc Adv Surg Tech A. 2023 Feb;33(2):155-61.
28. Stuck BA, Maurer JT, Möckel C, Hörmann K. [Excessive weight loss caused by dysphagia in superior laryngeal nerve neuralgia--a case report]. Laryngorhinootologie. 2000 Sep;79(9):548-50.
29. Yuce TK, Khorfan R, Soper NJ, Hungness ES, Nagle AP, Teitelbaum EN, et al. Post-Operative Complications and Readmissions Associated with Smoking Following Bariatric Surgery. J Gastrointest Surg. 2020 Mar;24(3):525-30.
30. Haskins IN, Amdur R, Vaziri K. The effect of smoking on bariatric surgical outcomes. Surg Endosc. 2014 Nov;28(11):3074-80.
31. Steffen KJ, Engel SG, Wonderlich JA, Pollert GA, Sondag C. Alcohol and Other Addictive Disorders Following Bariatric Surgery: Prevalence, Risk Factors and Possible Etiologies. Eur Eat Disord Rev. 2015 Nov;23(6):442-50.
32. Traversy G, Chaput JP. Alcohol Consumption and Obesity: An Update. Curr Obes Rep. 2015 Mar;4(1):122-30.
33. Riedel F, Goessler U, Hörmann K. Alcohol-related diseases of the mouth and throat. Best Pract Res Clin Gastroenterol. 2003 Aug;17(4):543-55.
34. Hatami M, Pazouki A, Kabir A. Excessive weight loss after bariatric surgery: a prediction model retrospective cohort study. Updates Surg. 2022 Aug;74(4):1399-411.
35. O'Brien PE, Hindle A, Brennan L, Skinner S, Burton P, Smith A, et al. Long-Term Outcomes After Bariatric Surgery: a Systematic Review and Meta-analysis of Weight Loss at 10 or More Years for All Bariatric Procedures and a Single-Centre Review of 20-Year Outcomes After Adjustable Gastric Banding. Obes Surg. 2019 Jan;29(1):3-14.
36. Hamdan AL, Safadi B, Chamseddine G, Kasty M, Turfe ZA, Ziade G. Effect of weight loss on voice after bariatric surgery. J Voice. 2014 Sep;28(5):618-23.
37. Pascoto G, Abreu C, Silva ML, Weber R, Pignatari SS, Stamm A. The impact of acute loss of weight on eustachian tube function. Int Arch Otorhinolaryngol. 2014 Oct;18(4):376-9.
38. Nguyen AD. Impact of bariatric surgery on gastroesophageal reflux disease and esophageal motility. Curr Opin Gastroenterol. 2021 Jul 1;37(4):364-71.
39. Elzouki AN, Waheed MA, Suwileh S, Adoor DM, Tashani O, Abou Samra AB. GERD outcome after bariatric surgery: A protocol for systematic review and meta analysis. Medicine (Baltimore). 2020 May;99(19):e19823.
40. Bellorin O, Senturk JC, Cruz MV, Dakin G, Afaneh C. Predictive Factors for Developing GERD After Sleeve Gastrectomy: Is Preoperative Endoscopy Necessary? J Gastrointest Surg. 2022 May;26(5):1015-20.
41. Guilleminault L. Chronic cough and obesity. Pulm Pharmacol Ther. 2019 Apr;55:84-8.
42. Nemni J. Severe chronic cough after Lap-Band gastric surgery. Can Respir J. 2007 Apr;14(3):171-2.
43. Savir S, Kalchiem-Dekel O, Naggan L, Maimon N. Respiratory deterioration following laparoscopic adjustable gastric banding: A three-year follow-up of over 3,000 subjects. Respir Med. 2016 Jun;115:66-71.