Case series / *Olgu serisi*

Effects of bariatric surgery on psychological well-being among adolescents: a case series study from Turkey

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ABSTRACT

Objective: *Our aim is to determine the psychiatric outcomes of bariatric surgery among adolescent patients with obesity, a condition with high psychiatric comorbidity rates.* ***Methods:*** *Psychiatric evaluation of the patients includes Beck Depression Inventory, Beck Anxiety Inventory, Eating Attitudes Test and World Health Organization Quality of Life questionnaire (WHOQOL-BREF) prior to surgery and at post-operative year.* ***Results:*** *Adolescent patients admitting for bariatric surgery have high rates of psychiatric comorbidities. We report significant improvement in psychological well-being of the adolescent patients following sleeve gastrectomy procedure including depression, anxiety and feeding behavior scores and quality of life.* ***Discussion:*** *Limited number of studies regarding the psychiatric outcomes of bariatric surgery on adolescent patients are present in the literature. Improvement in depression and quality of life scores have also been reported in previous studies, whereas, no comprehensive study on anxiety and feeding behavior scores, to our knowledge, had been performed. Therefore, our case series study is significant by demonstrating the psychiatric outcomes of bariatric surgery more thoroughly. In addition, higher reductions in BMI have been observed following sleeve gastrectomy procedure compared to the findings in the literature mostly including roux-en-Y gastric bypass procedure in adults. We propose that psychiatric comorbidities of the adolescent patients should be more prominent determinant of decision making procedure for bariatric surgery.* ***(Anatolian Journal of Psychiatry 2020; 21(5):544-548)***

Keywords: *adolescent, bariatric surgery, depression, anxiety, psychiatry*

Bariyatrik cerrahinin ergenlerde ruhsal durum üzerine etkileri: Türkiye'den bir olgu serisi çalışması

ÖZ

Amaç: *Bu çalışmada ergenlik çağındaki obezite hastalarında bariyatrik cerrahinin psikiyatrik sonuçlarını belirlemeyi amaçladık.* ***Yöntem:*** *Hastaların psikiyatrik değerlendirme süreci Beck Depresyon Ölçeği, Beck Anksiyete Ölçeği, Yeme Tutumu Testi ve Dünya Sağlık Örgütü Yaşam Kalitesi Ölçeğini (WHOQOL-BREF) içermektedir. Değerlendirme ameliyat öncesi dönemde ve ameliyat sonrasında 1. yıl takibinde yapılmıştır.* ***Sonuçlar:*** *Bariyatrik cerrahi amacıyla kliniğe başvuran ergenlik dönemi hastalarında eşlik eden psikiyatrik bozukluklar sık görülmektedir. Çalışmamızın sonucunda tüp mide ameliyatı sonrasında hastaların ruhsal durumlarında depresyon, anksiyete, yeme tutumu ve yaşam kalitesi ölçekleri de dahil olmak üzere önemli oranda iyileşme olduğunu gözledik.* ***Tartışma:*** *Bariyatrik cerrahinin psikiyatrik sonuçlarıyla ilişkili alan yazında az sayıda çalışma vardır. Depresyon ve yaşam kalitesi ölçeklerinde gözlemlediğimiz iyileşmeler önceki çalışmalarla uyumlu olup hastaların anksiyete ve yeme tutumlarındaki değişimleri inceleyen kapsamlı bir çalışma yoktur. Çalışmamız ergenlik döneminde bariyatrik cerrahi müdahale geçiren hastaların psikiyatrik durumlarını daha ayrıntılı incelemesi bakımından önemlidir. Ayrıca çalışma-*

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mızda tüp mide ameliyatı sonucunda ergenlik dönemi hastalarımızda beden kitle indeksinde alan yazında çoğunlukla yetişkin hastalarda yapılan roux-en-Y gastrik baypass ameliyatı sonucunda bildirilenden daha yüksek miktarda bir iyileşme görmekteyiz. Ergenlik dönemi hastalarında hastaların eşlik eden psikiyatrik bozukluklarının bariyatrik cerrahi kararı alınırken, kararın daha önemli bir parçası olmasını önermekteyiz. ***(Anadolu Psikiyatri Derg 2020; 21(5):544-548)***

Anahtar sözcükler: *Ergenlik, bariyatrik cerrahi, depresyon, anksiyete, psikiyatri*

INTRODUCTION

An epidemic of current medical era, childhood obesity, with an estimated prevalence of 18.5% has various comorbidities including type II diabetes mellitus, dyslipidemia, hypertension, obstructive sleep apnea, non-alcoholic fatty liver disease, pseudotumor cerebri and psychiatric conditions.[1,2] Behavioral therapy as dietary regulations and physical activity is preferred as first line treatment while pharmacotherapy such as orlistat and metformin are included if first line of treatment becomes ineffective. Despite being present at most guidelines; bariatric surgery is rarely preferred in patients under age 18 as it composes only 1% of all bariatric surgeries.[3] However, rates of surgical intervention at pediatric age group rises exponentially over the last decades despite the lack of large scale randomized studies regarding the efficiency and safety.[3,4]

Common adverse effects of surgical intervenetion in obesity are malnutrition, wound infections, post-operative bleeding, hiatal hernia, embolism, intestinal obstruction and micronutrient deficiency.[4] Post-operative depression or worsening of depressive status and suicidal intentions have also been reported. In addition, comorbid psychiatric conditions, especially eating disorders, and predominant etiologies of childhood obesity such as genetic, endocrinological and intrauterine factors are considered as negative predictors of success in bariatric surgery.[5] Therefore, multidisciplinary approach to childhood obesity is the basis of every treatment guideline. Eligibility criteria for bariatric surgery is as same as adult population, whereas, lack of consensus for age limitation is apparent among guidelines. However, bariatric surgery had been performed on pediatric patients as young as 5 years old.[6]

Most common psychiatric comorbidities include depression, anxiety and eating disorders while use of psychiatric medications such as anti-depressant and anxiolytic drugs is common among obese adolescents.[3-6] Although it has been considered as a minor eligibility criterion for bariatric surgery with lower prevalence rates compared to most organic comorbidities, psychiatric comorbidities are one of the major factors in the decision making process.[7] In this study, we report the effect of surgical intervention on psychological well-being of 4 adolescent patient suffering from obesity from a bariatric surgery center in Turkey.

METHODS

Prior to the study approval from Ethics Committee was obtained. Participants were recruited from a bariatric clinic performing high numbers of bariatric surgery per year in Turkey. Informed consent of the patients were obtained. Psychiatric evaluation of the patients prior to surgery and at 1-year follow-up include Beck Depression Inventory, Beck Anxiety Inventory, Eating Attitudes Test and World Health Organization Quality of Life questionnaire (WHOQOL-BREF).

WHOQOL-BREF, developed in 1998[8] and validated for Turkish population in 1999,[9] is a questionnaire composed of 26 questions designed to assess the quality of life of an individual through four subcategories as physical health, psychological health, social relationships, and environment. Score of 14 is considered as a standard score while scores higher than 14 are considered as high quality of life in those subcategories.

Beck Depression Inventory (BDI), a questionnaire with twenty-one 3-point Likert scale questions to evaluate the characteristic features and symptoms of depression, was developed in 1961[10] and validated for Turkish population in 2005.[11] Assessment of the individuals with BDI may reveal no depression (BDI ≤9), mild depression (10≤ BDI ≤15), moderate depression (16≤BDI≤23), and severe depression (BDI >23).

A questionnaire composed of twenty-one 3-point Likert scale questions, Beck Anxiety Inventory, is used to evaluate the characteristic features of anxiety in individuals. It is developed in 1998 by Beck et al.[12] and validated for Turkish population in 1998.[13] Assessment of the individuals may reveal no anxiety (BAI ≤15), minimal anxiety (16≤ BAI ≤22), moderate anxiety (23≤ BAI ≤42) and severe anxiety (BAI >42).

Eating Attitudes Test, developed in 1979 by Garfield and Garfinkel,[14] is a test with forty 6- point

Likert questions commonly used to evaluate troubled eating behaviors of individuals. It has been validated for Turkish population in 1989 by Savaşır and Erol.[15] Scores above 30 indicate troubled eating behavior.

CASE PRESENTATIONS

CASE 1

Sixteen-year-old female patient was presented to bariatrics clinic with BMI of 37.45 kg/m^2 (height: 162 cm, weight: 99 kg). Psychiatric history of the patient was significant for insomnia, severe podophobia triggered even with brief periods of visualization of feet, and aviophobia (phobia of airplanes) for two years. Social Isolation and distance to school were present with an average academic performance. She had been routinely followed-up by a child and adolescent psychiatrist and prescribed with fluoxe-tine. Pre-surgical evaluation of the patient demonstrated high eating behavior score and signs for depression and anxiety with low quality of life. Desire for surgery was originating from the patient. Primary complaint of the patient was social isolation and suicide threats towards parents. Further psychiatric evaluation of the patient showed no actual suicidal intentions and considered suicide threats as a mechanism to prevent her parents from discouraging her about the surgery. Patient underwent sleeve gastrectomy procedure after approval from the multidisciplinary council consisting of endocrinology, internal medicine, psychiatry and bariatric surgery specialists. Following the surgery fluoxetine treatment was discontinued and psychoeducation program was initiated for a year. At one-year follow-up patient had a BMI of 25.77 with improved psychological status. In addition, improvement in the feeding behavior, social relationship, psychological and physical health score had been recorded (Table 1).

Table 1. Body-mass index and psychiatric evaluation results of the patients before sleeve gastrectomy and at 1-year follow-up

Cases	Case 1		Case 2		Case 3		Case 4	
Features	Before surgery	At 1-year follow-up	Before surgery	At 1-year follow-up	Before surgery	At 1-year follow-up	Before surgery	At 1-year follow-up
General features (age, gender)	16, female		17, female		15, male		15, male	
BMI (kg/m^2)	37.45	25.77	44.98	26.70	56.63	29.40	53.06	34.61
Eating Attitudes score	38	12	32	19	45	16	52	22
Beck Depression Inventory	27	10	26	17	28	10	27	14
Beck Anxiety Inventory	21	6	16	11	19	8	18	12
General health score	4	9	3	6	5	8	6	8
Physical health score	17	27	10	20	23	25	16	23
Psychological health score	14	23	13	18	13	21	15	18
Social relationships score	6	12	5	11	12	13	10	12
Environmental health score	26	30	17	30	28	31	20	30

CASE 2-4

Seventeen-year-old female patient presented to bariatrics department with BMI of 44.45 kg/m^2 (height: 170 cm, weight: 133 kg). Psychiatric evaluation of the patient prior to surgery reveals high eating behavior and depression score with minimally high anxiety score. Quality of life was low (Case 2). She was routinely followed-up by a child and adolescent psychiatrists prior to bariatric surgery with no prescription.

Fifteen-year-old male patient presented to bariatrics clinic with BMI of 56.63 kg/m^2 (height: 165 cm, weight: 154.2 kg). Psychiatric evaluation performed prior to the surgery revealed high eating behavior and depression score with minimally elevated anxiety score (Case 3).

Fifteen-year-old male patient presented to bariatrics clinic with BMI of 53.06 kg/m^2 (height: 172 cm, weight: 157 kg). Psychiatric evaluation performed prior to the surgery revealed high eating behavior and depression score with minimally elevated anxiety score (Case 4).

Decision for bariatric surgery for case 2-4 were made by the multidisciplinary council consisting of endocrinology, internal medicine, psychiatry and bariatric surgery specialists. All patients were directly involved in the decision making

process for the bariatric surgery. All three cases were considered as morbid obese (BMI>40 kg/m^2) while 1 of the patient was routinely followed-up by a child and adolescent psychiatrists. None of the cases were using any psychiatric medication. All patients underwent sleeve gastrectomy procedure and routine follow-up of the patients including BMI measurements and psychiatric evaluations were performed (Table 1). At one-year follow-up all patients had reduced depression and anxiety scores as well as improved quality of life. In addition, significant reduction in eating behavior score had been recorded.

DISCUSSION

Bariatric surgery emerges as a promising treatment modality for obesity, a global epidemic affecting over 1.4 billion adults and over 40 million children worldwide, over the last few decades. In addition to medical conditions including hypertension, cardiovascular events, dyslipidemia, obstructive sleep apnea and non-alcoholic fatty liver disease bariatric surgery candidates are at risk of comorbid psychiatric conditions. Most common psychiatric comorbidities include anxiety disorder (15-33%), eating disorders (48-70%) and depressive disorders (15-70%).[16] Studies in adult population highlighted pre-operative psychological well-being as a predictive factor in the treatment outcomes of bariatric surgery.[17] Anxiety, common psychiatric comorbidity, has negative impact on weight loss among adults.[17] However, studies investigating psychiatric outcomes of bariatric surgery in adolescents are limited.

A systematic review including 3-year follow-up of 950 children and adolescent obese patients demonstrate 13.3 kg/m^2 decrease in BMI while laparoscopic roux-en-Y gastric bypass (47.6%) and adjustable gastric banding (27.8%) are the most commonly preferred procedures.[18] On the other hand, we report 18.91 kg/m^2 reduction in BMI (mean pre-op BMI=48.03, mean post-op BMI=29.12) with sleeve gastrectomy procedure in a year. In contrast to literature findings of superiority of roux-en-Y gastric bypass over sleeve gastrectomy in adults in terms of decline in BMI, our findings in a small study group indicates better weight loss with sleeve gastrictomy in adolescents.[19,20] Beneficial effects of sleeve gastrectomy may be associated with decrease in the levels of ghrelin, an orexigenic molecule, or psychologically more adjustable state of adolescents compared to adults. Therefore, choice for bariatric procedure should be individualized as the age of patient being among the primary determinants. Furthermore, we report considerable increase in quality of life in adolescent patients after sleeve gastrectomy including elevated physical health score (mean pre-op=16.5, mean post-op=23.75), psychological health score (mean pre-op=13.75, mean post-op=20), social relationships score (mean pre-op=8.25, mean post-op=12) and environ-ment score (mean pre-op=22.75, mean post-op= 30.25), concurrent with the literature.[21]

Beneficial effects of bariatric surgery on depressive symptoms have been reported in multiple studies while beneficial effects are transient in most cases by peaking at post-operative month 6 to 12 and regressing later on.[22-25] Nevertheless, contradictory studies claiming no beneficial effect of bariatric surgery on depressive symptoms in adolescent patients who were evaluated twice before the operations are present in the literature.[26,27] Our findings suggest significant improvement in depressive symptoms (mean pre-op BDI=18.5, mean post-op BDI= 9.25) with sleeve gastrectomy procedure in adolescents. In addition, it is important to note that one of our patient had discontinued antidepressant treatment in post-operative period. Limited numbers of studies in the literature regarding the efficiency of bariatric surgery on anxiety or eating disorders in adolescents remain inconclusive. Our findings suggest signi-ficant improvement in anxiety symptoms (mean pre-op BAI=27, mean post-op BAI=12.75) and eating attitudes score (mean pre-op score=41.75, mean post-op score=17.25).

To conclude, we report beneficial psychiatric effects of bariatric surgery in obese adolescents in terms of depressive symptoms and quality of life, concurrent with the literature, anxiety and eating disorder symptoms. In contrast to the literature, we observed better weight reduction with sleeve gastrectomy procedure in adolescents compared to other techniques preferred in adult studies. Our case series is significant by being the only study in adolescent patients investigating psychiatric effects of bariatric surgery in Turkey. We recommend consideration of psychological status of the patients as a valuable indication criterion at decision-making procedure for bariatric surgery. Our study is limited primarily due to low number of adolescent bariatric patients, thus, there is a clear need for more comprehensive studies.

Authors' contributions: *M.Ç.: design and coordination of the study, and writing of the manuscript; N.S.T.: coordination of the study, and data collection; S.Ç.: literature review, data collection and analysis, and writing of the manuscript.*

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