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الملخص العربي

كان العلاج الإكلينيكي للسمنة المفرطة الخطوة الأولى فى علاج هذا المرض الأيضى المعقد، و لكنه واجه العديد من المشاكل فى علاج الحالات المستعصية و بالأخص عند صغار السن.

و يؤخذ فى الإعتبار إمكانية إخضاع المريض للجراحة التى أثبتت كفاءتها فى الحفاظ على إنقاص الوزن و بخطورة تكاد تكون مقبولة.

أثبتت جميع طرق جراحات إنقاص الوزن نتائج أفضل بهذا الصدد مقارنة بالطرق الأكثر تحفظا و على الرغم من كونها طريقة تداخلية عنيفة فقد أوضحت أنها تقلل الأمراض المصاحبة و تحمل خطورة و معدل مضاعفات أقل.

و مازالت التقنية المثلى و الوقت الأمثل لإجراء الجراحة يعتمدان على دراسات للعديد من الأطفال المرضى و المتابعة الطويلة المدى، فكلما زاد عدد الحالات كلما زاد الميل إلى اعتبار الجراحة فى سن أصغر ودرجات أقل خطورة من السمنة.

على الرغم من حتمية التشدد و اعتبار عامل الخبرة عند وضع الضوابط الأولية لهذه التقنية إلا أن عدد المرضى الخاضعين للجراحة إلى الآن يمكننا من النظر إليها كوسيلة مفيدة مع المرضى المفرطى السمنة حتى فى أثناء السن المبكر.

بمجرد إثبات الفاعلية و الأمان لهذه التقنية سيتوفر لدينا مقوماتها و ضوابطها قبل حدوث ما يترتب على السمنة من عواقب وخيمة تزيد من معدل الخطورة والوفاة الجراحية مع الأخذ فى الاعتبار التحسن المستمر للأمراض مثل مقاومة الجسم لهرمون الأنسولين والاختناق النومى وارتفاع ضغط الدم.

و مع إدراك أن السمنة أكثر من مجرد مشكلة جمالية و كونها مرض تصحبه مجموعة معقدة جدا من الإضطرابات الأيضية التى تهدد الصحة العامة للمريض وأسلوب حياته, يتحتم علينا أن نوجه الأنظار إلى التدخل الجراحى بل و التقنيات العلاجية الأكثر عنفا لأخذ خطوات إيجابية للحد من هذه الإضطرابات و المشاكل.

هناك إيجابية مادية واضحة للجراحة حيث أن الحد من السمنة يؤدى إلى انخفاض التكاليف المادية المترتبة على مضاعفاتها على المدى المتوسط والبعيد.

نستنتج مما سبق أن الإقبال المتزايد على جراحات إنقاص الوزن بجانب تطور تحديث الوسائل الدوائية لعلاج السمنة يشكل خطوات واعدة نحو علاج السمنة المرضية أثناء سن الطفولة و المراهقة فى المستقبل.

Surgical Management of Childhood and Adolescent Obesity

Essay

Submitted for partial fulfillment of master degree
in **General Surgery**

By

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العلاج الجراحي للسمنة المرضية في سن الطفولة والمراهقة

رسالة مقدمة

توطئة للحصول على درجة الماجستير في **الجراحة العامة**

مقدمة من

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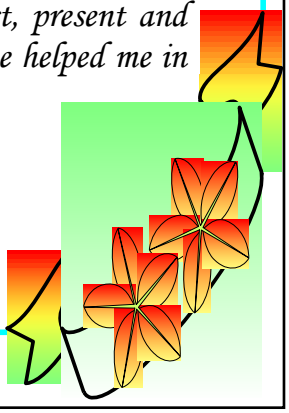
Lastly, but not the least, I wish to dedicate this work for the sake of the soul of my father, my mother, my past, present and future family members, my colleagues and all who have helped me in the preparation of this work.

Hisham Ahmed Ghoneim



Introduction

In the past 30 years, the prevalence of overweight among pediatric age groups has almost tripled. Current conservative estimates indicate that 15.5% of children and adolescents are obese (body mass index [BMI] of 95th percentile for age) **(Ogden, et al, 2002)**. Annual hospital costs for obesity-related diagnoses in the pediatric population increased 3-folds **(Wang, 2003)**.

Studies show that 50% to 77% of children and adolescents who are obese carry their obesity into adulthood, thus increasing their risks of developing serious and often life-threatening conditions. The risk increases to 80% if just 1 parent is also obese **(Freedman, et al, 2001).** Thus, pediatric obesity is clearly an epidemic in need of preventive and intervention efforts **(Wang and Dietz, 2002)**. Given the scope of this epidemic, effective public policy is needed to address the pediatric obesity problem **(Dietz, et al, 2002)**.

The scale of this problem requires a multifaceted approach across several sectors of society, including the academic community, government and the private sector to promote health in our children **(Dietz, et al, 2002)**.

Excessive weight gain is influenced by genetic, environmental, and biologic factors **(Schwartz, et al, 2003)**. Although genetics play a role in predisposing children to obesity, the recent increase in prevalence of childhood obesity is too rapid to suggest a significant genetic shift. Instead, the increase is believed to result from changes in behavior and environment **(Barlow, 2007)**. Factors such as increased sedentary time, decreased physical activity and an abundance of energy-dense, low-quality food are thought to encourage weight gain in children **(Barlow, 2007)**. Untreated overweight and obesity in childhood carries well-documented physical and

pshcyological consequences in both the short and long term **(Krebs, et al, 2007)**.

The medical consequences are well known and include potential pulmonary, endocrine, gastrointestinal, hepatic, reproductive and cardiovascular disorders. The psychosocial effects of childhood overweight and obesity can be harder to recognize and discuss but can be just as serious and may play a role in decreased activity and unhealthy eating, thus perpetuating obesity **(Barlow, 2007)**. Conditions frequently associated with severe obesity include premature death, heart disease, obstructive sleep apnea, hypertension, dyslipidemia, and type 2 diabetes mellitus **(Fontaine, et al, 2003)**, which has significant and well-documented cardiac, renal and ophthalmic complications for young adults. It is also noteworthy that reported quality of life scores for obese children were significantly lower than those for children of normal weight **(Schwimmer, et al, 2003)**.

Although dietary and behavioral approaches respresent the mainstays of treatment of childhood obesity, bariatric surgery increasingly is considered an option for treatment of adolescents with significant obesity-related comorbidities **(Capella, et al, 2003)**. This paradigm shift has occurred in part because of the realization that non surgical approaches are of limited effectiveness for severe obesity in children **(Levine, et al, 2001)**, and in part because of the documented health benefits of bariatric surgery in adults **(Inge, et al, 2005)**.

As the need for a surgical weight loss option for younger patients becomes evident, physicians are faced with the task of delineating clear, realistic, and restrictive guidelines for using this aggressive approach **(Epstein, et al, 1990)**.

Simple adoption of these guidelines for use in younger age groups would overlook the unique metabolic, developmental, and psychologic needs of adolescents and

could result in the inappropriate use and/or overuse of weight loss surgery for adolescents. In general, surgery should be reserved for very severely obese adolescents with comorbidities, after careful deliberation **(Garcia, et al, 2003)**.

Body mass index is a useful screening tool for assessing and tracking the degree of obesity among adolescents. Medical evaluations should include investigation into possible endogenous causes of obesity that may be amenable to treatment and identification of any obesity-related health complications **(Daniels, et al, 2005)**.

The most important ethical issues when considering an adolescent for a bariatric procedure are whether the patient's health is being compromised by severe obesity, whether the patient has failed more conservative options to meet that health need, and whether the patient has decisional capacity. Decisional capacity is not determined strictly by chronologic age, but many would agree that children < 13 years of age usually do not have the capacity to make decisions regarding such a complicated serious intervention. At 13 years of age, adolescent patients, if developmentally normal, may be able to make informed decisions. The responsibility then falls on health care professionals to make the argument for or against that capacity for any given patient. When there are questions about decisional capacity, specialists in pediatric psychiatry or psychology can assist in determining decisional capacity or competency (the legal term). Patients with decisional capacity should be allowed to participate in self-determining decisions. However, the younger the patient, the more compelling and serious the comorbidity of obesity should be to prompt surgical intervention **(Sugerman, et al, 2003)**.

The timining of surgical treatment of clinically severe obesity among adolescents is controversial and often depends on the severity of obesity-related comorbidities for individual patients. Neuroendocrine, skeletal, and psychosocial

maturation are accelerated during adolescence, and it is not yet known how these processes are affected by restrictive or malabsorptive surgical procedures. The rapid somatic growth observed in early adolescence requires adequate nutrition; therefore, bariatric procedures performed before the growth spurt could potentially compromise linear growth. Physical examinations should include evaluations of sexual maturation, because the linear growth spurt generally occurs before Tanner stage IV for both boys and girls. The majority of skeletal maturity is attained for girls by 13 years and for boys by 15 years of age **(Stanford, et al, 2003)**.

Several studies should be considered when candidacy for bariatric surgery is contemplated. These studies may identify conditions that may affect perioperative decision-making or may identify obesity-related comorbid conditions may justify surgical intervention. These studies include fasting glucose and hemoglobin A1C measurements, liver function tests, lipid profile tests, complete blood counts, thyroid function tests, pregnancy tests for female patients, and screening for micronutrient deficiencies. For patients with symptoms of obstructive sleep apnea, polysomnography is suggested. Finally, bone age assessment should be considered for younger patients, to document the degree of skeletal maturity **(Dolan, et al, 2003)**.

To date, a range of different types of bariatric procedures has been performed in this age group, including gastric bypass, vertical banded gastroplasty and adjustable gastric banding **(Angrisani, 2005)**.

There is currently a paucity of data comparing the efficacy and safety of various bariatric procedures among adolescents. However, both Roux-en-Y gastric bypass and adjustable gastric banding (AGB) have been effective in treating the medical consequences of severe obesity in adolescence **(Kothari, et al, 2002)**.