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The history of metabolic and bariatric surgery: Development of standards for patient safety and efficacy

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ABSTRACT

Weight loss surgery, also referred to as bariatric surgery, has been in existence since the 1950's. Over the decades, it has been demonstrated to successfully achieve meaningful and sustainable weight loss in a large number of patients who undergo these procedures. Additionally, the benefits observed across a number of metabolic disorders such as type 2 diabetes mellitus and hyperlipidemia, are often to a degree, independent of the weight loss, thus the term "metabolic bariatric surgery (MBS)" has become a better descriptor. Throughout its long history, MBS has evolved from an era of high morbidity and mortality to one of laudable safety despite the high-risk nature of the patients undergoing these major gastrointestinal procedures. This article will describe the historic evolution of MBS and concentrate on those events that were instrumental in reducing the morbidity of these operations.

Contents

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1. Introduction

Obesity is a pandemic that continues to spread as the world continues to modernize. Medical therapy is frequently utilized to help obese patients with weight reduction but is often insufficient for achieving meaningful and sustainable results. In contrast, metabolic and bariatric surgery (MBS) is only pursued by a small minority of eligible patients [1,2] but has proven to be the most effective intervention for securing significant weight loss and improvement of associated comorbidities [3,4].

MBS has evolved considerably since its origin in 1952 with the first small bowel resection with anastomosis [5]. For decades after its inception, MBS was uncontrolled and carried high morbidity, mortality, and failure rates. During this time, a multitude of surgical procedures were introduced. Some proved to be beneficial while others were abandoned due to weight loss failure, unacceptable complications, or the development of more efficacious procedures. Eventually, advances in operative techniques, along with better patient management, led to improvements in total weight loss along with reductions in morbidity and mortality. These dramatic improvements in efficacy and safety were, in large part, the result of regulatory institutions to both first define best practice protocols and then ensure that these safety measures were, in fact, followed across the field. In particular, the following institutions deserve recognition: the Institute of Medicine (IOM) for their landmark report, *To Err is Human*; the Betsy Lehman Center Expert Panel on Weight Loss Surgery; the American Society for Metabolic and Bariatric Surgery (ASMBS) and Surgical Review Corporation (SRC) with their joint Center of Excellence program, the American College of Surgeons' (ACS) Bariatric Surgery Center Network, and their eventual combined (ASMBS and ACS) Bariatric Centers of Excellence (COE) program through the Metabolic and Bariatric Surgery Accreditation and Quality Improvement Program (MBSAQIP). All have played pivotal roles in transforming MBS from a poorly-accepted discipline into the growing and venerable surgical practice it is today.

The late George L. Blackburn, M.D., Ph.D. (Fig. 1) an internationally renowned surgeon and nutritional support champion, was a pioneer in the field of MBS and responsible for numerous advances and contributions in the field. Perhaps most prominently, Dr. Blackburn was instrumental in both establishing and leading the Betsy Lehman Center Expert Panel on Weight Loss Surgery in an effort to improve comprehensive care for the bariatric patient through standardization of safety and efficacy parameters. This manuscript is dedicated in his honor and to his generous and inspirational legacy as a surgeon, scientist, public health advocate, author, educator, mentor, and leader in the fields of MBS, nutritional support, and obesity.

2. The Growing Obesity Epidemic and Bariatric Surgery

Obesity and obesity-related illnesses are the second leading cause of preventable death in the United States, claiming the lives of 400,000 Americans in 2000 [6]. These associated comorbidities include, but are not limited to, diabetes mellitus (DM), hypertension, cerebrovascular disease, dyslipidemia, peripheral vascular disease, sleep apnea, osteoarthritis, and cancer. In fact, a recent study from the Centers for Disease Control and Prevention revealed that obesity and being overweight are associated with at least thirteen different types of cancer, accounting for roughly 40% of all cancer diagnoses in the United States [7,8]. The prevalence of obesity has dramatically increased over the last fifty years. In 1962, it afflicted only 13.4% of the adult population [9] but now impacts greater than one-third of all Americans [10] and imposes annual domestic medical costs ranging from $147 billion [11] to $210 billion [12] through both direct and indirect expenditures. Additionally, national productivity costs and absenteeism secondary to obesity-related causes have been estimated to impose an economic burden ranging from $3.38 to $6.38 billion each year [13,14].

MBS currently is the most successful therapeutic option for combating obesity and obesity-related comorbidities [3,4,15,16] and has experienced a dramatic domestic increase in procedures from about 16,000 in the early 1990s [17] to 216,000 procedures in 2016 [18]. Globally, the number of operative procedures has also dramatically increased from 146,301 MBS procedures carried out in 2003 to almost 600,000 in 2014 [19,20]. The popularity of MBS among potential patients is further enhanced by both the advantages of and improvements in minimally invasive (laparoscopic) technique [21], along with the relative ineffectiveness of non-

Fig. 1 – The late Dr. George Blackburn (left) and Dr. Scott Shikora.

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