Section 25

SURGERY

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Chapter 169

Guidelines for Bariatric (Metabolic) Surgery for Indian Population

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INTRODUCTION

Over the past few decades, there has been a dramatic increase in the prevalence of obesity in India. The World Health Organization (WHO) estimates that more than 1 billion adults worldwide are overweight; of these, at least 300 millions are obese.[1] Obesity is associated with many chronic diseases, including Type 2 diabetes, hypertension, coronary heart disease, stroke and several cancers.[2]

Definitions of overweight [body mass index (BMI) > 25 kg/m^2] and obesity (BMI > 30 kg/m^2) are based essentially on criteria derived from studies that involved populations of European origin. The validity of these criteria in Asian populations has yet to be determined. It has been suggested that the associations of BMI with body composition and health outcomes may differ between Asian and European populations. Studies have shown that for a given BMI, Asians generally have a higher percentage of body fat than do Europeans. Asian populations have also been shown to have elevated risks of Type 2 diabetes, hypertension, and hyperlipidemia at a relatively low level of BMI.[3]

WHY ARE ASIANS PECULIAR?

Asian populations generally have a lower BMI than many other ethnic groups, but the association between BMI and glucose intolerance is as strong as in any other population.[4] The risk of diabetes (odds ratio) was significant for urban Indian populations with a BMI of greater than 23 kg/sq.m.[5] This has been confirmed by studies from other parts of India,[6] by studies in migrant Indians and in other Asian populations.[7] According to WHO recommendations, a BMI of 18.5–22 kg/m^2 is considered healthy for Asian populations.[8] Insulin resistance is one of the major etiological factors for diabetes and the risk association between obesity and diabetes is mediated through insulin resistance.

Many Asian populations have a higher total and central adiposity for a given body weight when compared to matched Caucasian populations. A higher prevalence of metabolic syndrome in South Asians is mostly attributed to the higher prevalence of central adiposity which is responsible for increased insulin resistance.

The international diabetes federation (IDF) criteria for metabolic syndrome recommends use of ethnic specific thresholds for waist circumference, which includes more than or equal to 90 cm in men, and more than or equal to 80 cm in women of Asian origin.[9]

BODY MASS INDEX CRITERIA FOR ASIANS

A WHO expert consultation concluded in 2004 that Asians generally have a higher percentage of body fat than Caucasian people of the same age, sex and BMI. Also, the proportion of Asians with risk factors for Type 2 diabetes and cardiovascular disease is substantial even below the existing WHO BMI cut-off point of 25 kg/m^2. Thus, WHO cut-off points did not provide an adequate basis for taking action on risks related to overweight and obesity in many populations in Asia. The WHO recommended for many Asian populations, additional trigger points for public health action, which were identified as 23 kg/m^2 or higher, representing increased risk, and 27.5 kg/m^2 or higher, as representing high risk. The suggested categories are as follows: less than 18.5 kg/m^2 is underweight; 18.5–23 kg/m^2 is normal; 23–27.5 kg/m^2 is overweight and 27.5 kg/m^2 or higher as obesity.[3]

BARIATRIC/METABOLIC SURGERY IN INDIA

Bariatric surgery or better referred to as metabolic surgery is any surgery performed on the stomach and/or intestines with the intent of resolution of metabolic syndrome [Obesity, Type 2 diabetes mellitus (DM), hypertension, dyslipidemia].

Bariatric surgery was first performed by Dr Shihari Dhorepatil in the late '90s. With the development of laparoscopic surgery, bariatric surgery has entered the realm of minimally invasive surgery and the first laparoscopic gastric bypass was first performed by Dr C Palanivelu in 2003. Over the years, the numbers have substantially increased as well as the type of procedures. The procedures that are now accepted as standard include: Lap banding, laparoscopic sleeve gastrectomy, lap Roux –en-Y gastric bypass and lap-modified duodenal switch (**Figures 1A to C**).

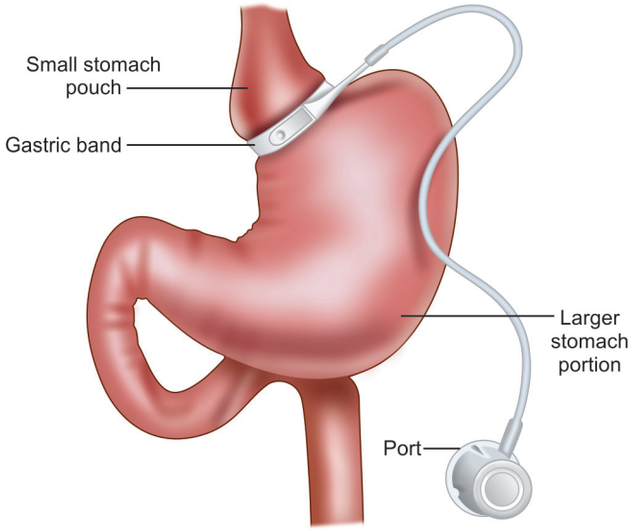

Figure 1A: Lap banding

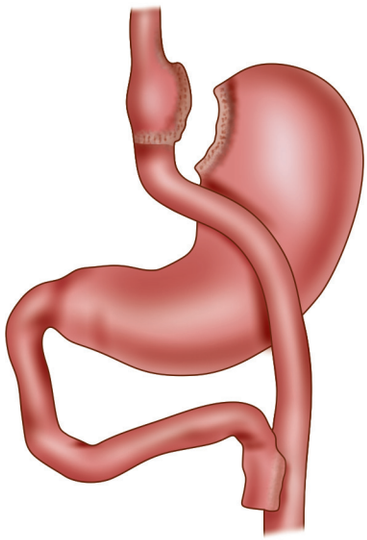

Figure 1C: Lap Roux-en-Y gastric bypass

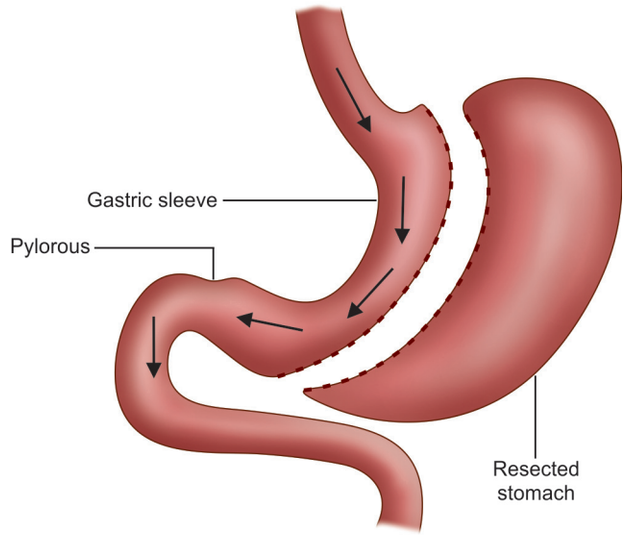

Figure 1B: Sleeve gastrectomy

MECHANISMS OF SURGICAL CONTROL OF DIABETES

The mechanism of diabetes resolution after gastrointestinal bypass remains unclear, and is not related to weight loss alone. In most cases, remission is observed in the days to weeks after surgery, before any substantial weight loss has occurred. Furthermore, emerging evidence now shows that these effects may be achieved in the nonobese population as well. This was initially shown in an experimental study in Goto-Kakizaki (GK) rats, a spontaneous nonobese model of T2DM. This study showed that a stomach-preserving Duodenal-Jejunal bypass (DJB) dramatically improves fasting glycemia and glucose tolerance, independent of weight loss and/or decreased caloric intake. This study was the first experimental demonstration that the antidiabetic effect of gastrointestinal bypass surgery is not unique to obese individuals and that weight loss/decreased caloric intake cannot entirely explain why surgery improves T2DM. Animal and human studies have corroborated this conclusion. In fact, there seems to be sufficient evidence in support of the fact that rearrangement of the anatomy of the gastrointestinal tract can influence glucose homeostasis by mechanisms that are additive to—and independent of—body weight loss.[10-13] Beyond the few gut hormones whose changes after bariatric surgery have been studied to date, the gastrointestinal tract produces more than 100 biologically active peptides, and possibly other yet-to be discovered substances. This suggests the possibility that various types of anatomic rearrangements of the gastrointestinal tract may activate several and distinct mechanisms with influence on glucose homeostasis.

One important hormone is glucagon-like peptide-1 (GLP-1), an intestinal hormone secreted from the distal ileum and colon in response to nutrient ingestion. GLP-1 acts on the beta cells of the pancreas to increase the level of cyclic AMP, leading to replenishment of the readily releasable pool of insulin granules during glucose-stimulated insulin secretion. Studies show that the postgastric bypass GLP-1 level is significantly higher when compared to the postgastric binding GLP-1 level. When considering the effect of GLP-1, it is possible that the increase in endogenous GLP-1 secretion plays an important role in the improvement of glucose metabolism by the gastric bypass surgery.

Although ghrelin is similar to GLP-1, in that it is related to appetite, it is actually an appetite-stimulating hormone.[14] It is likely that the appetite stimulation from ghrelin is due to its increasing activity in the stomach and suppressing of insulin secretion. There are many reports demonstrating that fasting ghrelin levels decrease after Roux-en-Y gastric

bypass compared to preoperation.[15] It has been reported that decrease in ghrelin levels occurs immediately following surgery and lasts for more than a year.[16] Through Roux-en-Y gastric bypass, food bypasses the distal stomach in which ghrelin is released, and this may account for the postbypass decrease in ghrelin levels.

GUIDELINES FOR SURGERY FOR THE ASIA-PACIFIC

According to the 1991 National Institutes of Health (NIH) consensus conference on gastrointestinal surgery for severe obesity, patients are candidates if they are morbidly obese (BMI > 40 kg/m^2 or ≥ 35 kg/m^2 with comorbidities), have failed attempts at diet and exercise, are motivated and well informed, and are free of significant psychological disease.[17] But due to the peculiarity of Asians as described above, the consensus may not include a large number of Indian patients.

Asian Pacific Bariatric Surgery Group (APBSG), which was founded in 2004 and officially changed its name to Asian Pacific Metabolic and Bariatric Surgery Society (APMBSS) in 2008, held a consensus meeting in 2005 and modified the indication for bariatric surgery for Asians.

Consensus in Asia-Pacific 2005:[18]

- Obese patients with a BMI greater than 37 kg/m^2
- Obese patients with a BMI greater than 32 kg/m^2 and the presence of diabetes or two significant obesity-related comorbidities.
- Have been unable to lose or maintain weight loss using dietary or medical measures.
- Age of patient more than 18 years and less than 65 years. Under special circumstance and in consultation with a pediatrician, bariatric surgery may be used on children under 18 years of age.

Because bariatric surgery currently is the most effective treatment for Type 2 diabetes, APBSG not only modified the indications for bariatric surgery but also emphasized its role in diabetic treatment. It was the first bariatric guideline of the world to mention a focus especially on diabetes.

According to the ethnicity of Asians, the IFSO-Asian Pacific Chapter (APC) consensus statement was established in 2011. Forty four bariatric experts from the Asia Pacific and other regions were chosen to have voting privileges for the IFSO-APC consensus at second IFSO APC Congress on 24th February 2011 in Rusutsu, Hokkaido, Japan. All voting delegates represented their respective societies or countries. The conclusion of the consensus summit is summarized below.

IFSO-APC Consensus statements 2011:

- Bariatric surgery should be considered for the treatment of obesity for acceptable Asian candidates with BMI greater than 35 regardless of the existence of comorbidities.
- Bariatric/GI metabolic surgery should be considered for the treatment of T2DM or metabolic syndrome, for patients who are inadequately controlled by lifestyle alternations or medical treatment for acceptable Asian candidates with BMI greater than 30 kg/m^2.
- The surgical approach may be considered as a nonprimary alternative to treat inadequately controlled T2DM or metabolic syndrome for suitable Asian candidates with BMI greater than 27.5 kg/m^2.
- Any surgery for T2DM or metabolic syndrome for Asian patients with a BMI less than 27.5 kg/m^2 should be strictly performed only under clinical study protocols with the informed consent of the patient and prior approval from an ethics committee.
- IFSO-APC generally recommends the following procedures for Bariatric and GI metabolic surgery for Asians: Gastric bypass, sleeve gastrectomy, gastric banding, biliopancreatic diversion with Duodenal switch (BPD-DS).
- Clinical study should be organized by highly experienced bariatric surgeons, with experience in over 100 cases of bariatric surgery.

Furthermore, an International Diabetes Federation (IDF) position statement in March 2011 also concluded that surgery should be considered as an alternative treatment option in Asian patients with a BMI between 27.5 and 32.5 kg/m^2 when diabetes cannot be adequately controlled by an optimal medical regimen, especially in the presence of other major cardiovascular disease risk factors.

These results indicate that the Asian region differs from other regions in terms of metabolic surgery and this will play significant role in progression of metabolic surgery not only in Asia but all over the world.

SUMMARY

In India, there has been an increase in obese patients undergoing bariatric surgery which leads to more efficient weight-loss results. Bariatric surgery is an effective treatment option for severely obese patients for whom weight loss has been problematic with conventional pharmacotherapy and/or life style intervention-based treatment. These surgeries have been shown not only to decrease body weight but to have an effect on incretins. Thus, even if diabetes did not completely get cured by bariatric surgery, change in incretins has beneficial effect on diabetes. Therefore to choose the operative procedure of bariatric surgery, especially on patients who have basic disease, it is necessary to think about the dynamic state of incretins.

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