Clinical Update
Bariatric & Metabolic Surgery In Nigeria

Abuchi Okaro MS FRCS FWACS

Mr Abuchi Okaro is a Consultant Laparoscopic Upper GI and Bariatric Surgeon

The accelerating pandemic of diabetes is recognised as one of the greatest public health dilemmas of our time.10 The personal, health and societal costs of the disease are enormous, with populations in many parts of the developing world predicted to have a much increased and disproportionate burden of the diabetes by the year 2040.[11]

The micro and macro-vascular complications of type 2 diabetes and resultant cardiovascular morbidity (and mortality) have wide-ranging implications for public health.[12,13]

What do we know about the current and future burden of diabetes in Nigeria? The figures are largely unknown. The World Health Organization (WHO) estimates that approximately 5% of the country's adult population is diabetic, 40% of which are either obese or overweight *(Figure 4).*

Despite growing evidence that bariatric (metabolic) surgery offers a potentially cost-effective treatment option for obese patients with type-2 diabetes, most established algorithms have until recently failed to fully recognise its benefits as a standard form of treatment for diabetes.

This article explores the evolution of this treatment and evidence underpinning its increasing use in the treatment of type 2 diabetes and associated metabolic conditions.

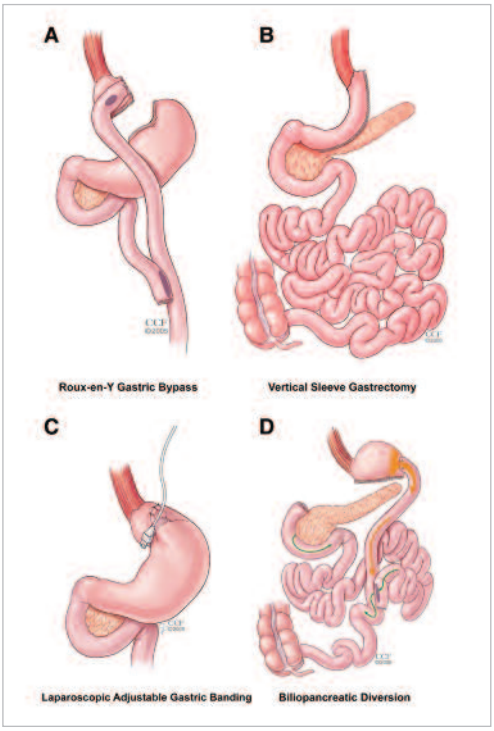

Fig 1: Bariatric/Metabolic Surgical procedures

Metabolic Surgery – Types

Bariatric (or Metabolic) surgery remains an exciting and rapidly advancing branch of gastro-intestinal surgery with origins dating back to 1952[1]. The surgical procedures performed, have as one would expect changed significantly over the years. Presently, there are 4 main surgical procedures routinely performed *(Figure 1)*.

1. Roux-en-Y Gastric Bypass, Vertical (Figure 1)
2. Vertical Sleeve Gastrectomy
3. Laparoscopic Adjustable Gastric Banding
4. Biliopancreatic Diversion Glucose

Glucose Homeostasis & Gastro-intestinal Surgery

The paradigm shift observed in the management of certain metabolic conditions is based entirely on emerging scientific evidence strongly suggesting that weight loss (or bariatric) surgery is capable of achieving resolution of long-term chronic diseases such as diabetes and hypertension.

In 2007, an accumulation of such developments and increasing acceptance of the wider applicability of this form of surgical intervention resulted in the redefinition of bariatric surgery performed solely for the correction of metabolic disease, in favour of the more appropriately-named, metabolic surgery. The ability of the surgeon to conduct a series of intricate operative procedures to rearrange the gastro-intestinal anatomy and achieve enhancements in physiological processes and organ function offers many advantages to modern medicine that even complex (pharmaceutical) interventions have consistently struggled to attain.

Improvements in glucose homeostatic control are related to changes in gut hormones, bile acid metabolism and intestinal microbiomes.[9] The result is reduced liver glucose production, increased tissue glucose utilization, increased insulin sensitivity and enhanced β-cell function *(Figure 3)*. These changes are observed to occur independent of any weight loss.

Bariatric Surgery & Type 2 Diabetes Guidelines

Although metabolic surgery has continued to gain rapid acceptance in treatment centres all over the world, there remain several obstacles to its universal uptake varying from region to region. A series of consensus meetings have been held over the last decade, resulting in a number of amendments to diabetes treatment guidelines. In 2016, the 2nd Diabetes Surgical Summit (DSS 2) released the strongest ever endorsement of the procedure.[2]

Bariatric surgery is now increasingly recommended as an established option (alongside lifestyle and medical treatment) in the management of obese patients with type 2 diabetes *(Figure 2)*. This is in recognition of its consistently better outcomes in these patients (in terms of blood glucose and HbA1c control) compared with pharmacological agents or behavioural therapy over the medium term (15 years or less).[3,4,5,6,7,8]

Setting Up A Service

There are several key issues to consider when setting up of a bariatric/metabolic surgery service in Nigeria.

1. **Multi-disciplinary team (MDT) approach** – This is essential to the delivery of bariatric and metabolic surgery services. The team's core specialists are the bariatric surgeon, the bariatric anesthetist, the endocrinologist and the bariatric dietitian. A cardiologist, pulmonologist, psychologist and physiotherapist are also very frequently involved in the patient journey.

2. **Patient selection** – Bariatric/metabolic surgery patients frequently have one or more co morbidities. The selection, preparation and preoperative assessment of patients according to strict criteria are critical to ensuring a healthy patient experience and good clinical outcomes. The hospital where services are rendered needs to have the appropriate caliber of medical equipment required to offer minimally-invasive complex gastro-intestinal surgery.

3. **Outcome measures** – The delivery and quality of this type service in Nigeria does need to be benchmarked against accepted international standards. There are a number of options available for monitoring and measurement of procedural outcomes, such as percentage excess weight loss (%EWL), quality of life scoring, etc. Although considerably less sophisticated than some of the other options, the simplest and most reliable parameters are as follows:

- Average post-operative length of stay (12-72 hours)
- Post-operative leak rate (3% or less)
- 30-day Operative mortality (0.4% or less)

In Conclusion

There can be very little doubt, based on the fact of actual disease prevalence and current state of evidence-based diabetes care in Nigeria, that demand for bariatric/metabolic surgery services will continue to rise.

The major obstacles to delivery of these services locally are obvious and, in the majority, associated with a lack of appropriately organised specialist facilities and trained clinical personnel. Additional practical but not insurmountable challenges such as cost of service provision and supply of medical consumables exist in common with other similar services delivered across the healthcare sector.

The accuracy of future demand and actual capacity required for Nigeria's healthcare system to meet this demand remains unknown. It certainly is the case that patients will continue to seek treatment abroad until the capacity and quality of healthcare services in Nigeria improve. I remain hopeful that as more specialist centers turn their attention towards innovative treatments such as metabolic surgery, patients will have more options available to them for treatment of chronic conditions such as diabetes and other forms of metabolic disease.

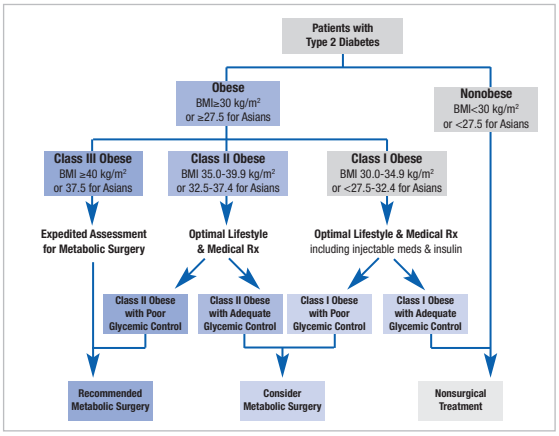

Fig 2: Metabolic surgery and Type 2 DM

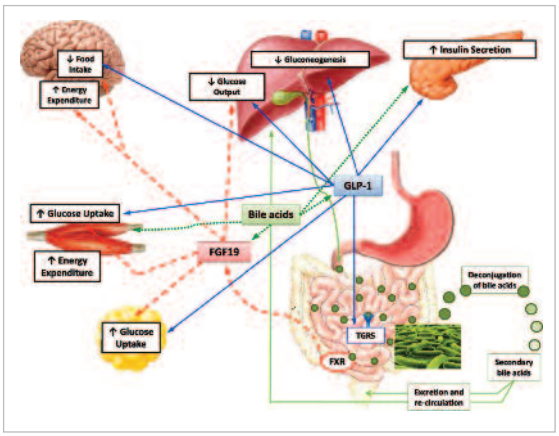

Fig 3: Glucose homeostasis - http://care.diabetesjournals.org/content/39/6/893

REFERENCES

1. Kremen AJ, Linner JH, Nelson CH. An experimental evaluation of the nutritional importance of proximal and distal small intestine. Ann Surg. 1954;140: 439–448
2. Francesco Rubino et al - Diabetes Care 2016 June; 39(6): 861-877
3. Dixon JB, O'Brien PE, Playfair J, et al. Adjustable gastric banding and conventional therapy for type 2 diabetes: a randomized controlled trial. JAMA 2008; 299:316–323
4. Mingron e G, Panunzi S, De Gaetano A, et al. Bariatric surgery versus conventional medical therapy for type 2 diabetes. N Engl J Med 2012; 366:1577–1585
5. Sjöström L, Peltonen M, Jacobson P, et al. Association of bariatric surgery with long-term remission of type 2 diabetes and with microvascular and macrovascular complications. JAMA 2014;311: 2297-2304
6. Carlsson LM, Peltonen M, Ahlin S, et al. Bariatric surgery and prevention of type 2 diabetes in Swedish obese subjects. N Engl J Med 2012;367: 695–704
7. Rubino F, Marescaux J. Effect of duodenal-jejunal exclusion in a non-obese animal model of type 2 diabetes: a new perspective for an old disease. Ann Surg 2004; 239:1–11
8. Rubino F, Schauer PR, Kaplan LM, Cummings DE. Metabolic surgery to treat type 2 diabetes: clinical outcomes and mechanisms of action. Annu Rev Med 2010; 61:393–411