

# Bariatric surgery: a European perspective

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## Introduction

The escalating obesity pandemic sweeping across the globe is rapidly becoming one of the most pressing public health issues of our time. Obesity is associated with an increased risk of premature death and significant morbidities including type 2 diabetes, hypertension, cardiovascular disease and certain cancers.

The inheritance of obesity is complex and remains poorly understood. With the exception of a few, recognised single gene mutations,<sup>1</sup> the vast majority of cases are characterised by an increased caloric intake and decreased activity levels leading to an imbalance in total energy expenditure.

The statistics are alarming. According to the World Health Organisation, rates of obesity have more than doubled since 1980. In 2008, 1.5 billion people were overweight, i.e. with a BMI  $\geq 25\text{kg/m}^2$ . Of this population, over 500 million were obese, i.e. with a BMI  $\geq 30\text{kg/m}^2$ .

## Summary

Health care systems around the world are being stretched by pressing needs to cater for populations that are becoming more and more overweight and obese. Obesity is associated with substantial morbidity and mortality rates and, although dietary and lifestyle advice can help some, bariatric surgery is an increasingly popular option in the treatment armamentarium. Gastric banding, gastric bypass and sleeve gastrectomy are used routinely across Europe to treat obese patients despite recognised complications that can result from the procedure. The beneficial effects of bariatric surgery on type 2 diabetes are well documented with a significant number of people reporting an improvement in their condition following surgery. A number of clinical trials are now underway to study the health care benefits of offering bariatric surgery to adolescents and also to people with a lower BMI.

The role of the diabetes specialist nurse is becoming increasingly important as multidisciplinary teams form to take care of these patient cohorts both pre- and post-surgery and in their long-term follow-up care.

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## Key words

bariatric surgery; obesity; type 2 diabetes; clinical trials

By 2008, a quarter of the UK population was reported to be obese (BMI  $>30\text{kg/m}^2$ ).<sup>3</sup> If this trend continues, by 2050, 60% of the male population and 50% of the female population of women will be classified as obese.<sup>4</sup> There is a similar trend in Germany. In 2011, one in every two German adults was classified as being overweight (BMI  $\geq 25\text{kg/m}^2$ ), and one in five as obese.<sup>5</sup> In France, although well-known for having a lower rate of obesity compared to many other European countries, rates are in excess of 10% of the population now being termed as clinically obese.<sup>6</sup> As this picture is mirrored in other countries across Europe, the need for bariatric surgery will escalate considerably as health care systems struggle with the burden of obesity and the associated increase in type 2 diabetes.<sup>7</sup>

Dietary advice, where available, has a limited and often short-lived effect on weight loss and, despite the numbers of patients, medical intervention has been largely unsuccessful. Side effects like steatorrhoea have affected compliance rates with some of the current drugs, like

orlistat. Other drugs have been withdrawn due to safety concerns, leaving the obese population with few options for weight loss.<sup>8</sup>

Bariatric surgery is now positioning itself in this market as the best long-term and most cost-effective solution to the obesity problem.

## Types of bariatric surgery

There are several different types of surgical procedure in the bariatric surgeon's armamentarium.<sup>9</sup>

### Gastric banding

Historically, gastric banding, which involves laparoscopic surgery to place a small, doughnut-shaped silicon ring around the upper part of the stomach, was popular. The band contains fluid which is injected from a port placed just under the skin. This allows the size of the opening to be adjusted manually over the band's lifetime. By direct pressure on the neural fibres at the upper part of the stomach, signals are generated to attenuate patients' appetite. The benefits of the banding procedure include that it is quick to perform and that it is reversible should any side effects

occur. The main drawback of gastric banding is that it may take several visits after surgery to adjust the band to the correct 'tightness' to suppress hunger.

#### *Gastric bypass*

Although a more invasive and time-intensive procedure, the Roux-en-Y gastric bypass has gained popularity recently in Europe and is the most common type of bariatric surgery in many European countries. In large part, this is because the amount of weight loss that is observed is initially both greater and more rapid. This procedure staples the stomach to produce a much smaller pouch. A section of the small intestine is then bypassed and the so-called 'Roux limb' is used to link this new, smaller stomach to the small bowel, creating a shorter gastrointestinal tract, which results in an increased feeling of fullness after small meals. Although reversible, the drawback of this procedure is the increased complications associated with more complex surgery.

#### *Sleeve gastrectomy*

Like the gastric bypass, the sleeve gastrectomy is also gaining popularity. Although simpler than the bypass, the sleeve gastrectomy is more radical as it permanently removes a part of the stomach leaving it about a quarter of its original size. The benefit of this process is that it is safer to perform in patients who are very high risk for other surgical options. The drawback is that clinicians are still awaiting long-term information and recent studies have suggested that up to 20% of patients may regain much of their weight within five years.<sup>10</sup>

#### **The European perspective**

In 2008, the most recent year for which comprehensive data are available, there were 344 221 bariatric surgical procedures performed

Country	No. of procedures
Austria	1741
Belgium/Luxembourg	8700
Czech Republic	900
Denmark	2004
France	13 722
Germany	2117
Greece	2875
Hungary	300
Israel	2500
Italy	4842
Netherlands	3500
Norway	1500
Poland	814
Romania	837
Russia	750
Serbia	10
Spain	6000
Sweden	2894
Switzerland	850
Turkey	500
United Kingdom	6000

**Table 1.** Number of bariatric procedures carried out per European country in 2008. (Adapted from Buchwald H, Oien DM. *Obes Surg* 2009;19:1605–11)<sup>11</sup>

across the globe.<sup>11</sup> Of these 220 000 (63.9%) were performed in the USA and in Canada. Table 1 lists those which were carried out in Europe.

It is recognised, however, that, despite these numbers increasing considerably – for example, evidence suggests that almost 30 000 procedures were carried out in France and over 7000 in the UK in 2011 – Europe is still woefully under-resourced to carry out the number of bariatric surgical procedures that are required.

#### **Role of bariatric surgery in type 2 diabetes**

Increased sedentary behaviour coupled with the easier access to attractive calorie-dense foods has, in large part, driven the wave of the so-called 'obesogenic' environment that is allowing the number of cases of type 2 diabetes to spiral. As type 2 diabetes is associated with micro- and

macrovascular damage, premature mortality and morbidity, there is a desperate need to find new and affordable treatments for the condition.<sup>12,13</sup>

An audit conducted in the UK in 2011 reported that bariatric surgery could be used as an alternative and cost-effective treatment to prevent a number of obesity-related health problems, including type 2 diabetes.<sup>14,15</sup> In addition, the audit showed that over 85% of people who had type 2 diabetes prior to surgery witnessed an improvement in their condition after a two-year period. There is, indeed, a growing body of opinion which suggests that bariatric surgery should be used sooner rather than later and not just as a last resort.<sup>16,17</sup>

The exact mechanisms by which surgery ameliorates type 2 diabetes remain under review. Research suggests that favourable changes in insulin sensitivity as well as the levels of incretin gut hormones may be responsible.<sup>18</sup> However, other work indicates that changes in the rate of gastric emptying, food preference and bile acid metabolism may all have a role.<sup>19,20</sup>

#### **Complications of bariatric surgery**

Despite the recognised outcomes for obese patients, bariatric surgery is not without risk. Recognised complications short term include surgical issues like anastomotic leaks, bleeding, venous thromboembolism and infection. In the longer term, issues relating to band slippage and band erosion in cases where a gastric band has been fitted have been reported.<sup>21,22</sup>

Nutritionally, some micronutrient deficiencies have been reported in iron, vitamin B<sub>12</sub>, folate, calcium, vitamin D and vitamin A. These can be quickly recognised and nutritional advice and supplementation given. Historically, while bariatric surgical procedures were in their

infancy, the type of operations used caused malabsorption. However, as surgical techniques have improved, in addition to chronic hypoglycaemia and bone demineralisation, occur less frequently, and can be managed.<sup>23,24</sup>

Cosmetically, weight loss can cause excessive skin folds, particularly in older patients, whose skin elasticity has decreased. Some countries, including the UK, do not routinely offer procedures to cater for this although centres in other countries often do.<sup>25</sup>

Finally, it has been reported that death caused by accidents and suicide are significantly higher in postoperative patients.<sup>26,27</sup> One retrospective study of 10 000 patients indicated that such deaths were 58% higher in this group than in an unoperated cohort.<sup>28</sup>

The exact causes of this remain poorly understood. Researchers recognise the higher rates of depression and mental health issues that are observed in patients prior to surgery, and recognise the importance of robust psychological testing and counselling prior to and after the procedure.

#### Research portfolio

According to ClinicalTrials.gov, there are over 80 clinical trials on bariatric surgery either open to recruitment or recently closed around Europe with about one-third of these trials being conducted in France.<sup>29</sup>

In Sweden, research programmes are interested in the lower age group of potential patients. Unpublished work from Olbers *et al.* suggests that patients between 13 and 18 years old with a BMI >40kg/m<sup>2</sup> do as well as adults after gastric bypass. The trend towards accepting more adolescents onto the Swedish programme has been increasing in recent years.

In France, a study is currently recruiting children and adolescents

between 13 and 18 years of age and with a BMI >35kg/m<sup>2</sup> to evaluate prospectively the potential number of paediatric patients eligible for surgery.<sup>30</sup> In the Netherlands, the BASIC trial – Morbid Obesity in Children and Adolescents: a Prospective Randomised Trial of Conservative Treatment Versus Surgery – is a similar study recruiting patients aged 12–16 with an age and sex adjusted BMI >40kg/m<sup>2</sup> or >35kg/m<sup>2</sup> with associated co-morbidity.<sup>31</sup> The results of these studies and others will give health care systems the evidence they need to offer bariatric surgery to younger cohorts.

Also of interest to the research community is the lower limit of BMI where surgery can be offered as an option. Currently set in most countries at over 40kg/m<sup>2</sup>, by setting the limit at 35kg/m<sup>2</sup>, twice as many patients would be eligible for surgery. Guidance from the National Institute for Health and Clinical Excellence in the United Kingdom states that, for patients with diabetes, then a BMI of 35kg/m<sup>2</sup> will be considered for bariatric surgery.<sup>32</sup>

In Sweden, the Swedish Obese Subjects (SOS) study is a prospective non-randomised controlled intervention study designed to examine the long-term effects of bariatric surgery compared to usual care in obese subjects. The inclusion criteria were age between 37 and 60 years with a BMI ≥34kg/m<sup>2</sup> in men and ≥38kg/m<sup>2</sup> in women. The study has shown that bariatric surgery is associated with a reduced number of cardiovascular deaths (myocardial infarction or stroke) indicating a lower incidence of cardiovascular events in obese adults who had a fasting insulin above 17mU/L. In addition, it has shown that bariatric surgery is associated with reduced cancer incidence in obese women as well as long-term weight loss and decreased overall mortality.<sup>33–35</sup>

In Italy, 200 people with type 2 diabetes with a BMI between 30 and 35kg/m<sup>2</sup> are currently being recruited into a study to compare bariatric surgery versus standard medical treatment. Subjects will be monitored during a five-year follow-up period to assess the effects of the surgical procedures on resolution of their diabetes at one, three and five years.<sup>36</sup>

Again, the results of these and other studies will determine the cost:benefit ratio of offering surgery to people with a lower BMI.

#### The role of the nurse

Much of the patient's follow up is carried out by nurses. Although in its infancy virtually everywhere, there is a growing need to ensure a cadre of diabetes specialist nurses who are trained in dealing with patients who have had bariatric surgery.

As noted, the number of procedures taking place in certain countries is suboptimal leading to a surge in the level of 'health tourism' occurring. Patients desperate for the procedure and unwilling to wait, search online for clinics offering surgery abroad. The main problem with this is that there is no follow up in place, and it is often the diabetes nurses who have to cater to these patients upon their return to their own country.

While this is a surgical procedure, there is growing evidence that the bariatric surgeons need to work as part of a multidisciplinary team. According to the International Diabetes Federation's recent position statement 'Bariatric surgical and procedural interventions in the treatment of obese patients with type 2 diabetes', the multidisciplinary team has several important functions – these include: patient education; follow up; clinical audit; effective surgical procedures; and a need to understand and recognise any surgical complications in a

timely manner, and to know when to refer back to the surgeon, or others for specific care.<sup>37,38</sup>

### Conclusion

With increasing numbers of bariatric surgical procedures being undertaken across Europe comes an increasing need to bring the knowledge and support of the diabetes nurse into the evolving multidisciplinary teams that must be in place to cater to these patients postoperatively. This significant role will ensure important continuity between obesity and diabetes clinics.

### Declaration of interests

There are no conflicts of interest declared.

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