

## **IMAGING AND BARIATRIC SURGERY**

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### **Incidence, Impact, Surgical approaches and Imaging**

Obesity is a severe medical problem in the Western world with the condition increasing in incidence yearly, having reached 34% of the adult population in the United States in 2008 but the rise appears to have slowed down. Obesity is a problem in much of Europe as well as in Mexico. Only Asian countries e.g. Japan, Korea, India etc. seem to have thus far avoided this calamity.

The rapid rise of obesity is best demonstrated in the United States where its incidence is also race connected. The general statistics for the whole population showed an increase from 19.4% in 1997 to 24% in 2004 and then to 34% in 2008 where it appears to temporarily remain flat. The incidence of obesity in the United States is also race related. For the white population the state by state incidence was below 10% for the whole country as contrasted in 2008 when only Colorado had an incidence of obesity below 15%.

The problem is considerably worse for the black population. In 2008 their incidence of obesity was 34- 35% in all states except in Vermont and New Hampshire. Hispanics fare better, but even for that segment of the US population the incidence of obesity in most states was above 24% in 2008.

Obesity is a worldwide affliction, with Mexico and the United Kingdom following the US in high incidence. France and Italy's incidence of obesity is less than one third of that in the US, while Japan and Korea have an incidence that is less than one tenth.

Obesity carries with it a slew of medical complications: hypertension, atherosclerosis, obstructive sleep apnea, cancer, non-alcoholic fatty liver disease, pancreatitis, osteo-arthritis, gout, cataracts. The cost of consequences of obesity is of the same scale as of consequences from smoking and

exceeded 125 billion US Dollars in 2005 and that cost is even much higher today.

Bariatric surgery at this time is considered to be the only consistent weight losing and maintaining approach and the number of such operations has increased from 20 thousand in 1995 to over 200,000 in year 2000 and while steadily increasing, this still represents less than 1% of eligible patients.

In the United States the increase in such operations is facilitated by Medicare (Federal Government insurance over the age 65) and many private insurance companies' reimbursement.

Bariatric surgery leads to impressive improvements in health. Decrease and even cessation of diabetes in 80-91% of cases, decreases of hyper-lipidemia 71-93 %, hypertension 71-87%, obstructive sleep apnea 56-93%.

Bariatric surgery started in 1954 with jejunal-ileal bypass resulting in multiple serious complications and this approach was soon abandoned.

Gastric-bypass operation underwent multiple modifications and is today the most frequent and successful bariatric operation.

Gastric sleeve resection, bilio-pancreatic diversion with or without duodenal switch are complicated operations reserved for the most obese patients sometimes weighing over 225 Kg.

The second most often performed bariatric operation in the US is the laparoscopically introduced adjustable band ( lap band) which is restrictive, reversible, technically simple to introduce and has few complications, although it is not as effective as gastric bypass, or its more complicated versions. The success of lap band depends on strong willed patients.

The role of imaging for all bariatric operations is:

- a. Exclusion of postoperative leaks.
- b. Assessment of anatomy when surgery was performed in another hospital,

c. Assessment of and search for complications.

Fluoroscopy is the simplest imaging approach, particularly in the immediate postoperative period, while CT is used generally in the later postoperative period, and sometimes needs to be individualized.

In the very heavy obese patients (over 220 kg) contact with the conventional gantry deteriorates image quality. Much more open gantries are available but are rare beings very expensive.

It is estimated that all bariatric operations have a 1/3 percentage of complications, less frequent in hospitals where the surgeons specialize in it and perform many bariatric operations. The most severe complications are postoperative leaks and late internal hernias.

The commonest complications of lap band surgery are gastric fundus slippage and late severe esophageal dysmotility, even so the complication rate of lap band surgery is very low but is very much higher when the lap band is augmented by gastric bypass surgery.

Imaging remains to be an extremely important adjuvant of bariatric surgery.

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