Obesity, Surgery and Diet

Excess body weight plays a major role in the development of some diseases that require surgery and it affects all aspects of surgery, related or unrelated to body weight. To determine excess body weight, health care professionals use the body mass index (BMI) formula, which is body weight divided by the square of height. The 'proposed' normal BMI for a median statured adult person (5'7") ranges between 18.5 and 25 (120 and 160 lbs.). However, in the U.S., the median BMI is 26.5.

Adults with a BMI between 25 and 30 (160 to 190 lbs.; about 30% of the U.S. population) are considered overweight. Those with a BMI between 30 and 40 are considered obese, and those with a BMI greater than 40 are labeled extremely obese.

A very typical problem associated with obesity is the development of hernias. The body walls are made of muscle and connective tissue called fascia, which only have enough strength to hold pressure within a certain range. As weight accumulates, pressure builds up, primarily in the abdomen, and stretches the muscles and fascia, which can develop weak spots.

A hernia occurs when an organ or fatty tissue squeezes through one of these weak spots. Although generally occurring in the abdomen, hernias can also occur in the groin (inguinal), navel (umbilical), midline (ventral, epigastric or diastasis of the recti) and in previous incisions (incisional). Other problems resulting from increased pressure inside the abdomen are hiatal hernia (upper stomach) and reflux esophagitis, hemorrhoids, and varicose veins in the legs.

Individuals who are not obese also can develop hernias, due to either genetic factors or increased intra-abdominal pressure due to other mechanisms: lifting, pushing, coughing (chronic bronchitis), labor and delivery, and straining to urinate or defecate.

Potential Surgical Complications

There are several possible complications that apply primarily to obese surgery patients. First, obese patients are at higher risk of pulmonary and cardiac problems since they are less able to expand their lungs. This puts them at greater risk of forming clots in the legs, which can travel to the lungs. Obesity is also associated with diabetes and hyperlipidemias which, in turn, can lead to cardiac disease.

Second, the incisions needed are at a higher risk of wound infections due to more bacteria being present in the skin folds, less resistance to infection by the increased adipose (fat) tissue, and higher blood sugar levels.

Third, whether the surgery is performed for hernias or not, obese patients are at risk of incisional or recurrent hernias due to the factors already mentioned.

Challenges and Solutions

Surgeons have always faced a challenge in gaining sufficient exposure within the abdomen to do a surgical procedure when the patient is obese. The challenge is heightened when minimally invasive (laparoscopic) surgery is used. Adipose tissue accumulates under the skin and fills spaces within the abdomen. When a camera is introduced into the abdomen of very obese patients, the fatty tissue has to be pushed and held out of the way so that the surgeon can visualize an organ (gallbladder, bowel).

Hernia surgery evolved from simple suturing to using mesh or solid "patches" or a combination of both. These patches are incorporated into the body creating scar tissue through them (mesh) or around them (solid). Over time, the patched area becomes stiff and may fail by detaching from the surrounding abdominal wall leading to a recurrent hernia or to new hernias elsewhere in the abdominal wall. In addition, hernias patches can become infected, can erode through the intestine, and can make future operations very difficult and riskier.

The newest innovation in hernia surgery is to use "biological" patches that have been cleared of any immune cells and sterilized. They are meant to serve as a matrix for the body to lay collagen (scar protein). But even they can keep their strength for a limited time (several months).

The key for a successful hernia surgery is for the patient to lose weight, reducing the intra-abdominal pressure to normal levels. If the excessive pressure can be eliminated, then hernias can be successfully repaired by using either the native tissues or by using patches.