Surgery for Crohn Disease – Current Status and Future Challenges – Webinar Notes by Dr. Michelassi.

There are several **principles** which drive surgical treatment of Crohn's disease:

- ✓ Surgery does not cure Crohn's disease. This is not like oncologic surgery and therefore oncological principles of surgical resections (margins, anatomically-based mesenteric excision) do not have place in surgery for Crohn's disease.
- ✓ The intent of surgical treatment in CD is to address complications of the disease.
- ✓ An extension of this principle is that surgery in Crohn's disease has exclusively a palliative intent unless dealing with the rare case of a malignant transformation. This means that the surgeon must know what there is to palliate before operating. Is the patient affected by obstructive symptoms? He is the patient disease complicated by septic complications? Answering these questions prior to surgery is extremely important in extensive Crohn's disease. At surgery surgical intervention must be targeted to the lesions creating the complication
- ✓ It derives from the above concept that the mere presence of a Crohn's lesion at surgery does not translate in a mandatory surgical intervention on it. We said that Crohn's surgery is palliative. So, if a particular lesion is not creating any symptoms or is not the site of a complication, that lesion may very well be left behind untouched. This is a very important concept in extensive Crohn's disease especially of the jejunum and ileum. Patients with extensive jejunal and ileal Crohn's disease are at risk of a short gut if aggressive resections are carried out.

Complications of Crohn's disease

The three major complications of Crohn's disease leading patients to the surgeon are obstructive , septic and general deconditioning.

Obstructive complications are secondary to fibro-stenotic disease or inflammatory disease which narrows the intestinal lumen. Fibro-stenotic disease is common in the upper GI tract such as the duodenum, jejunum and proximal ileum. Yet, probably the most common example of inflammatory disease causing partial obstruction is Crohn's disease of the terminal ileum.

Inflammatory complications are secondary to inflammatory phenotype of inflammatory penetrating phenotype. In the 1st case the intestine appears diseased, with thickened

inflamed walls and potentially a thickened mesentery; In the second case the disease has perforated into an abscess or a fistula. Abscesses can be initially treated with antibiotics if smaller than the 3 centimeters in diameter but eventually the segment of intestine which led to a walled-off perforation and an abscess will need to be resected to prevent additional perforations and septic complications. Fistulae require surgery if communicating with a squamous cell epithelium such as and entero-cutaneous fistula or an entrero-vaginal fistula or an entero-vesicle fistula; entero-enteric or entero-colic fistulae, if asymptomatic, do not require surgery unless the disease that created the fistula also creates additional symptoms.

General deconditioning occurs when patients have partial obstructive complications or inflammatory non penetrating disease leading to anemia, hypoalbuminemia, weight loss, lack of energy and a general sense of decreased well-being and quality of life. In these cases, addressing the cause of these complications and symptoms will return the patient to the expected quality of life.

It is interesting to see that the fibro-stenotic Crohn's disease is more prevalent in the upper GI tract while inflammatory Crohn's disease is more commonly seen in the distal small bowel and colon. This is probably due to a different microbiome in the upper GI versus the lower GI tract with gram negative bacteria more commonly populating the distal small bowel and colon.

Two additional but less common complications are hemorrhage and cancer. Hemorrhage usually originates from a deep ulcer borrowing into intramural arteries; cancer is usually secondary to severity of inflammation and duration of disease. A surgeon must suspect cancer in patients with a long history of Crohn's disease. One common example is a patient coming to the hospital with a complete bowel obstruction that does not resolve spontaneously within 24-48 hours. This usually indicates a fixed obstruction such as cancer rather than inflammation which responds to a corticosteroids administration and time. In these cases, Intraoperative examination of the obstructing point is extremely important and that one in doubt an oncological resection is indicated.

Preoperative evaluation consists of an accurate physical examination looking for abdominal masses, tenderness, evidence of fistula. Endoscopic and radiologic imaging is important to corroborate the clinical suspicion and diagnosis. Usually, radiologic imaging of the small bowel with a CT scan with contrast or an MRI and endoscopic imaging of the colon with a colonoscopy is sufficient to have a complete intestinal road map. Yet, be

aware and prepared. Some lesions are missed by radiological imaging: hence intraoperative examination of the entire small bowel is important.

Preoperative preparation of the patient must address hematological deficiencies such as hypoalbuminemia, hypoproteinemia and weight loss. Occasionally patients may require blood transfusions if severely anemic or parenteral nutrition to transform their metabolism from a catabolic to anabolic in preparation for surgery.

Surgery in a Crohn's disease can be performed in a minimally invasive fashion most of the times. In my experience patients presenting with primary disease can be addressed with laparoscopy or robotic surgery in as many as 90 to 95% of cases; patients presenting with recurrent disease have higher chances of conversion but still can be performed laparoscopically or robotically in at least 70% of cases if not more. Impediment to complete a procedure in a minimally invasive fashion usually are a very large and adherent inflammatory mass or extensive adhesions in recurrent disease.

Conduct at surgery

As I mentioned earlier it is extremely important to first examine the entirety of the small bowel for missed lesions. Once a precise road map of the extension of the disease is obtained, an individualized approach needs to be defined. First, lesions which do not appear to create obstruction or do not appear to have complications can potentially be left untouched. Second, lesions which need to be addressed surgically, can be addressed either by resection or strictureplasty.

Now in the majority of cases, Crohn's disease is usually located just in one location, and the most common location is that terminal ileum, for which an ileo-cecectomy is sufficient. But in cases of extensive Crohn's disease, and these are the patients at high risk of short gut, a surgeon needs to create a surgical plan that palliates all symptoms and maintains as much intestine as possible. So the question is: how do I decide between intestinal resections and bowel sparing procedures.

Structuroplasties are best suited to fibro stenotic disease. They're not designed for inflammatory disease. In general, strictureplasties can be applied in almost 100% of duodenal strictures and about 30% of jejunal and ileal small bowel disease. It is the rare case where a structuroplasty can be performed on terminal ileitis or in Crohn's colitis

because these locations usually are sites with inflammatory phenotype, not fibro-stenotic phenotype.

There are also contraindications to stricture plastics such as the presence of dysplasia or cancer or hemorrhage, and a stricture which is so close to an area that needs to be resected for which in the economy of a surgical procedure it is easier to include the stricture in the resection of the diseased segment.

With all this in mind a surgeon should be able to create an individualized approach to extensive Crohn's disease.

Recurrences

Unfortunately, as we know, Crohn's disease is a recurrent disease. Recurrences occur with certain prevalence at sites of previous anastomosis. For many decades, surgeons have studied different anastomotic configurations in the hope to identify one which would prevent anastomotic recurrence. There have been several meta analysis suggesting that a wide side to side anastomosis may, and I underline may, have the best chance at reducing the rate of postoperative anastomotic recurrence.

A lot of interest has recently been generated by the Kono-S. Professor Kono, a Japanese surgeon, described this anastomosis in a paper published in 2011. In that paper he presented the results suggestive of a less intense endoscopic recurrence at five years and the absence of surgical recurrences all the way to seven years in comparison with the traditional side to side anastomosis. I thought that the paper was interesting but also had several methodological problems. Together with the seven European centers, three of which in Italy, we're now conducting a prospective, randomized study comparing the Kono-S anastomosis to the side to side anastomosis after resection of terminal ileum for Chron’s terminal ileitis. We have enrolled 500 patients and we will follow them up to 10 years to study the endoscopic and the surgical recurrence rate.