Constipation is the most frequent bowel dysfunction with paramount affects on people’s quality of life and mental wellness; it has been estimated that about 30% of people in western countries are afflicted by constipation (1) with heavy aftermath on the health national system.

Constipation can be a primary disorder or secondary to neurological, pharmacological, depression, endocrine diseases or child abuse (2). Primary constipation is commonly distinguished in slow transit type, outlet obstruction or both, according to “Rome III Criteria” (3). Females of any age are more frequently affected by both these types of constipation. The incidence of true slow transit constipation in presence of a normal colon was overestimated in the past, whilst an increasing number of outlet obstruction constipation cases are now identified after the availability of new diagnostic procedures.

Clinical work-up in patients with constipation should focus on the exclusion of organic or secondary causes of constipation by colonoscopy (or barium enema) and accurate anamnesis, followed by more specific functional investigations (colonic transit study by radiopaque markers for slow transit constipation, and dynamic defecography for outlet obstruction). Complementary investigations are anorectal manovolumetry (to exclude Hirschsprung’s disease and rectal hyposensitivity) and some autonomic tests to identify patients with autonomic neuropathy which will probably do not benefit from surgery (4).

Another clue point in this work-up is the assessment of the severity of the disease using dedicated scoring systems [Wexner-Agachan score (5), KESS score (6), Altomare ODS score (7), PAC-SYM score (8)] and the evaluation of effects of the disease on patient’s quality of life [PAC QoL (9) and CRQoL (10)]. These evaluation have recently been introduced not only in clinical research but also in the clinical decision making process.

Although constipation is mainly a medical problem, there are several cases which could benefit from surgery. A surgical approach to slow transit constipation dates back to the early Victorian age in England (11) where Arbuthnot Lane first performed successfully a total colectomy for constipation getting fame and honors (for this he was nominated Sir by her majesty the Queen Victoria). However this aggressive approach fall into disgrace when his theory of fecal autointoxication was revealed unsubstantiated and surgery for constipation was abandoned for more than 60 years.

Nowadays colectomy and ileorectal anastomosis for treating slow transit constipation is considered the last option in a very selected group of patients when any other kind of treatments has failed and when the patient’s quality of life is severely compromised. For this type of constipation, beside polyethylene glycol based laxatives (12, 13, 14), an increasing number of new drugs have been experimented and are currently under trial, targeting different mechanisms of action like chloride-channel...
activator (lubiprostone), guanylate cyclase agonist (linaclotide), 5HT(4) agonists (Pruca-lopride, Alvimopan) (15).

With the exception of severe constipation caused by dilated, atonic colon and rectum (Ogilvie’s syndrome, adult megacolon, ect) the number of patients submitted to total or subtotal colectomy is very small and is decreasing. In these cases the exclusion of a colonic pseudobstruction or a panenteric autonomic neuropathy should be considered before surgery.

A recent review on total colectomy and ileorectal anastomosis for constipation reports an overall patients satisfaction rate of 86% but a postoperative morbility of 20% and a postoperative mortality of 2.6%. Late complications are mainly small bowel obstruction (18%), diarrhoea (14%), fecal incontinence (15%), abdominal pain (35%), and recurrent constipation (9%) (16-24).

Any attempts to have a less invasive approach by means of segmental colectomy got disappointing results (20) with the exception of subtotal colectomy with antiperistaltic cecoprotostomy (Deloyer-Sarli procedure) (25), where the spared ileocolic valve allows preventing the ceco-ileal reflux and small bowel bacterial overgrow and the persistence of the caecum allows adequate water and electrolytes absorption and biliary acid turnover (26, 27). Patients with neurogenic disease (spina bifida, Hirschsprung’s disease, spinal post-traumatic lesions) could benefit from less invasive alternatives like the antegrade colonic enema or the ileorectal bypass procedure (28, 29). The original technique of antegrade colonic enema (Malone) is often unfeasible as the appendix has frequently been removed or is too short and because of the frequent appendicostomy stricture, but reassuring long-term outcome have been shown using a modified technique (Marsh and Kiff technique) (30).

More recently, the development of electrical devices for peripheral nerve stimulation in several pelvic floor dysfunctions (31, 32), has created new expectations for less invasive treatments of chronic constipation using sacral nerve and tibialis nerve electrostimulation.

A recent multicenter trial on 65 patients with constipation (33) showed a very high success rate (65%) after a median follow up of 28 months, but these results need to be confirmed on the long term. Other similar experiences report less brilliant results (48% success rate) (34).

Posterior tibial nerve stimulation (PTNS) has been recently introduced in clinical practice after a period of skepticism, to treat urinary (35) and fecal incontinence (36, 37) and, although at the moment there are no published studies about its use in constipation, same clinical trials have been proposed in Europe. In this perspective it is noteworthy to report an increasing number of studies dealing with (electro)acupuncture in treating chronic constipation, suggesting an interesting and effective role of acupuncture (38, 39).

Although the clinical evidence of the use of electricity delivery to peripheral nerves in constipated patients is still poor, this field of research is promising and full of interests (40).

Obstructed defecation (OD) was recognized to be an individualized type of constipation only in the late 70's (41). Since then, there has been an increasing interest in the pathophysiology and treatment of this common condition, even because new surgical techniques and new devices, specifically designed to treat some types of OD, have been introduced.

In this respect, however, OD caused by pelvic floor disinnery should be excluded from surgery and treated by means of biofeedback and other forms of pelvic floor retraining (42, 43) or by Botulinum toxin injection (44). Similarly, OD caused by rectal hypomotility and low sensitivity could benefit from biofeedback or, in selected cases, by electrostimulation on the sacral nerves.

The use of dynamic defecography and ODS score can help to identify the right indication for surgery, but psychological matters should always be taken into consideration and possibly excluded.

Anatomical causes of OD like rectoceles, rectal intussusceptions, rectal internal mucosal prolapse may be surgically treated, although correction of anatomy not necessarily restore the function (45). A large number of operations have been proposed to cure OD, with different approaches (endorectal, vaginal, perineal or intrabdominal route) and with different techniques, clearly indicating the great uncertainty about this topic. Some of the reasons for that are the frequent association of multiple perineal defects, the occurrence of undetected psychological disorders and prob-
ably an excessive extension of the indication: for surgery.

Rectoceles were traditionally repaired by gynaecologists with transvaginal posterior colporrhaphy, independently of the occurrence of defecatory disturbances, but, in the last 20 years, it has become a field of interest of colorectal surgeons. The correction of the rectocele as an isolated dysfunction causing fecal entrapment and outlet obstruction, by an endorectal approach (Block, Sarles, Khubchandani) has become obsolete in favor of perineal or intrabdominal approaches. The correction of the rectocele, as an isolated dysfunction causing fecal entrapment and outlet obstruction, by an endorectal approach (Block, Sarles, Khubchandani) has become obsolete in favor of perineal or vaginal approach which better expose the anterior rectal wall allowing its reinforcement by rectal wall plication or application of a mesh (46). On the other hand, rectal intussusception can effectively be repaired by endorectal mucosectomy (internal Delorme) (47) or stapled trans-anal rectal resection (STARR) (48). This latter technique has gained wide popularity among colorectal surgeons because of its apparent simplicity and, probably, because of marketing pressure. STARR technique using two PPH01 staplers or the Contour staple has been proved to be effective in most of the cases when patient’s selection is appropriate (49, 50), however a worrying number of severe complication have been reported (51). This consideration together with the frequent occurrence of fecal urgency and the high rate of symptomatic recurrences (52) should suggest caution (53), both in patient’s selection and procedure performance, which should be started only after an appropriate surgical training.

The intrabdominal approach to cure isolated rectal intussusception with rectopexy (Wells, Ripstein, Frisman-Goldberg) is going to be progressively abandoned in favor of the ventral rectopexy (better laparoscopic) which enable repair of associated enterocele and vaginal prolapse (54, 55).

In conclusion, surgery must be considered the last option to cure a functional disease like constipation, and should be adopted only in selected cases unresponsive to any conservative treatment. The adoption of strict entry criteria (using validated scores, appropriate imaging and physiological tests) and choice of the most effective surgery performed only by dedicated colorectal surgeons, is of paramount importance for the success of these operations. Failure to follow these recommendation may lead to disappointing results, symptoms recurrence and complication not easy to treat and poorly acceptable, with consequent increase of medico-legal controversies.

Patients with an impaired quality of life because of functional diseases want to fix their problem with low (or even no) risk, by minimally invasive operation and with low recurrence rate, but, at the moment, we are still in the middle way of a bridge between the old invasive and high risk approach and the future no-risk, minimally invasive and highly effective one.

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