



The Iceberg diagram for the treatment of obstructed defecation

Mario Pescatori MD, FRCS, EBSQ

Parioli Clinic, Rome and Cobellis Clinic, Vallo della Lucania, Italy

Website: www.ucp-club.it

E-mail: ucpclub@virgilio.it

Introduction

Obstructed defecation syndrome (ODS) is a type of chronic constipation characterized by straining at stool, sense of incomplete evacuation, fragmented defecation and, in some cases, self digitation to assist evacuation. Patients with ODS are most frequently females and often they need either

enemas or laxatives to defecate. Symptoms of ODS may be quantitatively evaluated using the ODS score (1), which takes in account different parameters such as the time spent in the toilet, the use of laxatives and enema, the sense of incomplete evacuation etc.

Evident and Occult Diseases

Patients with ODS have either a rectal internal mucosal prolapse or a rectocele, or both, in over 90% of the cases. They may be simply diagnosed carrying out a digital exploration and a proctoscopy. There are surgeons who believe that excising the prolapse and repairing the rectocele they will solve the clinical problem. This is unlikely, because prolapse and rectocele are more effects (of excessive straining) than causes of ODS. When they become large, they represent contributory cause, but there are **always** other underlying diseases more difficult to diagnose, which are responsible for symptoms. We may call them **occult diseases** and we may divide them in **functional** and **organic**. If we image a **surgical ship** (*Figure 1*) trying to avoid the shrinkage on a stormy sea where there is an iceberg, similar to the one which destroyed the Titanic, it is essential to see in advance which are the **evident rocks**, or evident lesions i.e. rectal internal mucosal prolapse

and rectocele, i.e. **the tip of the iceberg**. But it is even more important to see the “rocks” which are **occult** or “under water”, representing the associated disease. If we do not see them and we do not cure them, we will not be able to cure patient’s symptoms.

In a previous prospective study (2) carried out in 100 patients, most females, we found out that **all of them** had at least **two** occult lesions or “under water rocks”. The Iceberg Diagram (ID) is represented in *Figure 2*. It has been recently validated by Australian gynecologists in the journal *Pelviperineology*.

Psychological disturbances (either anxiety or depression or both) and animus or non relaxing puborectalis muscle on straining are the most frequent **functional occult diseases** or “under water rocks”, being present in two-thirds and 44% of the cases, respectively. Rectal hyposensation is present in one third of the cases. Pudendal

neuropathy and irritable bowel syndrome or and slow intestinal transit time are the other two functional diseases. Among the **occult organic lesions**, urogenital associated

diseases (prostatism, colpocele, vaginal vault prolapse and cistocele) are the most frequent, followed by enterocele and sigmoidocele, recto-rectal intussusception and solitary rectal ucer syndrome.



Figure 1

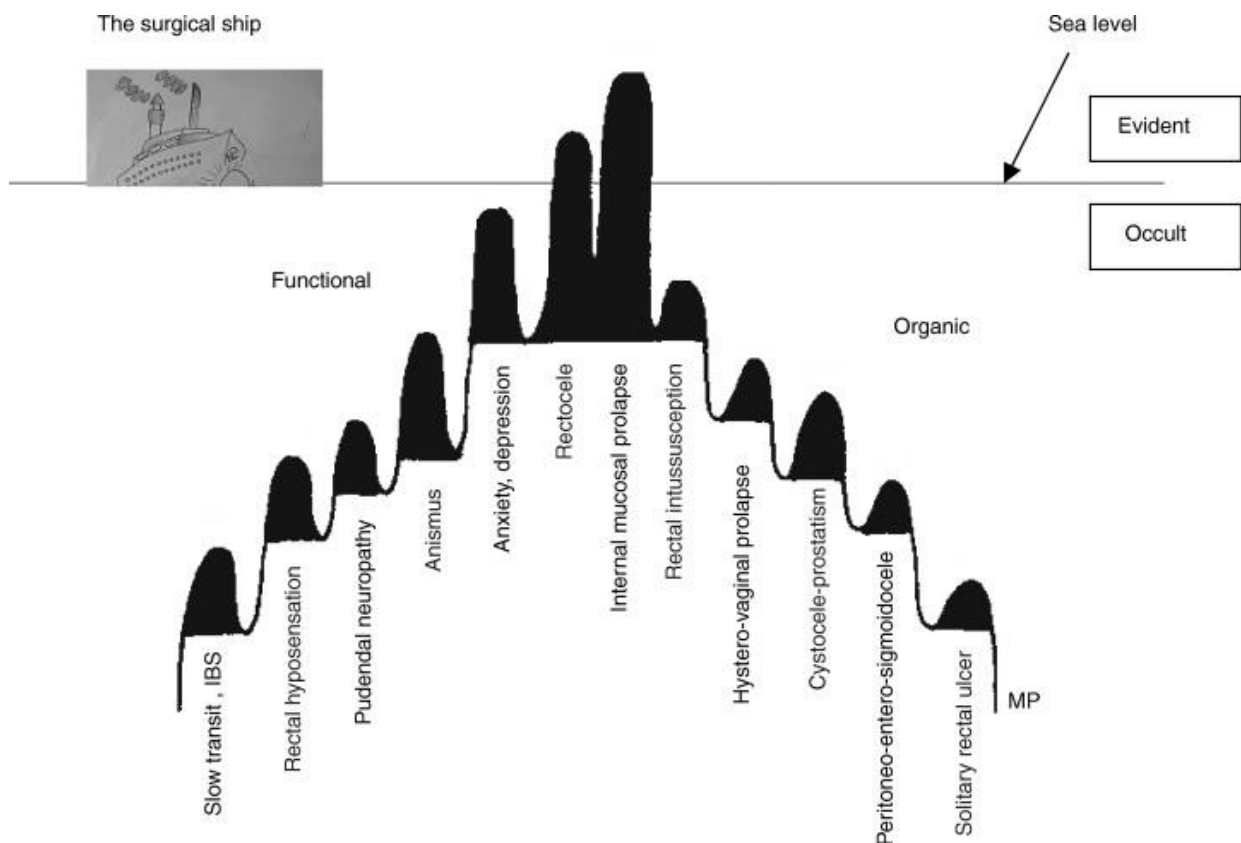


Figure 2



Perineal Examination According to the Iceberg Diagram

Special attention should be paid during the proctological exam, i.e. inspection, digital exploration and proctoscopy, in the sense that, to follow the ID and evidentiate some of the occult diseases or “underwater rocks”, we need to examine not only the anus, anal canal and lower rectum but **the whole perineum**, i.e. the posterior, the central and the anterior compartment. When dealing with a female patient, both the anorectum and the vagina should be examined with a bi-digital exploration, aimed at assessing the thickness of the recto-vaginal septum and the size of the rectocele, if any. The patient should be asked to strain in order to evaluate a perineal descent, if any (descent of the perineum = more than 2 cm on straining). Patients who report either fecal urgency or anal incontinence need to be carefully examined searching for an either delayed or slowed **anal reflex**, which may be elicited touching the perianal skin with a needle and observing the reflex response of the external sphincter contraction. An alteration of anal reflex, together with a short, i.e. not adequately maintained, sphincter’s contraction (less than 20 seconds) and a reduced rectal sensation are likely to be present in patients with pudendal neuropathy. Those at risk are multiparous vaginal females and patients with perineal descent. In order to assess rectal sensation, a latex balloon connected to a rubber catheter is gently inserted through the anus for 6 – 7 cm and then slowly inflated with air. The balloon may be simply constructed with the finger of a surgical glove. Three levels of rectal sensation are recorded, the first one being **onset of feeling**, i.e. when the patient realizes that “something” has been inflated inside the rectum (usually 20-30 ml of air), the second one being **call for stool**, i.e. when the patients feels the need to evacuate (usually 50-70 ml of air), and the third being **maximal urgency**, i.e. when the patient feels a strong and almost painful

desire to defecate and would rush to the toilet (usually around 120 ml of air). At the end of the examination the patient is asked to evacuate the balloon filled with 100 ml of air. Those with anismus are likely not to expel the balloon.

ANISMUS, if any, has to be investigated during perineal examination, by inserting the finger into the anus up to the lower rectum and hooking the finger posteriorly, aimed at feeling the bulk of the posterior part of the puborectalis muscle. Then the patient is instructed to take a big breath and then to gradually push down or evacuate. At this point, the exploring finger should feel the relaxation of the muscular bulk. If no relaxation occurs or if the opposite, i.e. a contraction, is appreciated, the patient is likely to suffer from **anismus**. It should be noted that the lack of relaxation of the puborectalis muscle of the patient might be an artefact, due to the ambulatory outpatients setting, to the digital exploration or the brain-nerve tension. That is why the diagnosis of anismus needs to be confirmed by a transanal ultrasound and/or a defecography.

PROCTOSCOPY has to be carried out both at rest and on straining aimed at evaluating the presence and the degree of a rectal internal mucosal prolapse, if any. According to our classification, we define it as **1st degree** if the apex of the prolapsing mucosa descends through the anorectal ring without reaching the dentate line, **2nd degree** if it reaches the dentate line, **3rd degree** if it descends down to reach the anal verge. Surgery is never indicated for first degree prolapse, mostly rubber band ligation is indicated for second degree prolapse and surgical excision is usually indicated in case of third degree prolapse.



Prior to insert the proctoscope through the anus, an examination of central and anterior compartment should be carried out inserting the proctoscope through the vulva. First, the posterior aspect of the vagina should be examined searching for the bulk of a rectocele, if any. Then the central part looking for the bulk of an enterocele, if any, asking

the patient to strain and cough. **Enterocele or sigmoidocele** are more likely to occur in females who had a hysterectomy and feel pelvic heaviness and/or abdominal low hypogastric pain. Finally, the tip of the proctoscope should be orientated anteriorly, aimed at evidentiating either a cystocele or a urethrocele, if any. **Cystocele** is more likely to occur in females with urinary incontinence.

Further Details on the Diagnosis and Treatment of Both Evident and Occult Lesions in the ODS

Evident Lesions or “Tips of the Iceberg”

1. Rectal Internal Mucosal Prolapse (or Recto-Anal Intussusception).

The **diagnosis** can be made either under visualization on straining, simply detecting a small piece of pink mucosa protruding through the anal verge, in case of third degree prolapse or by means of transanal ultrasound or by defecography. At transanal ultrasound with a rotating probe (either 7 or 12 MHz), the prolapse is more evident if anterior and appears as an area of mixed echogenicity inside the hypoechoic circle of the internal sphincter and-or of the lower anterior rectal muscle. The **treatment** may be carried out by a rubber band ligation if 1st - 2nd degree and by a surgical excision if 2nd - 3rd degree. In case of circumferential rectal internal mucosal prolapse a transanal circular stapled excision can be carried out (3). When carrying out an anterior rectal prolapse ligation and excision in a male patient, one has to avoid deep dissection, aimed at preventing hemospermia due to a prostatic trauma.

2. Rectocele

Easy to **diagnose**, as before mentioned. It **rarely** requires a surgical operation: when is

larger than 3 cm, when entraps barium on the straining phase of defecography and when the patient has to digitate in order to evacuate. There are three types of digitation , one consists of extracting the stool from the rectum using fingers, the second one without any insertion, but just touching-stimulating the perianal space anteriorly at the skin level and thus eliciting a rectal peristalsis mediated by means the superficial and deep transverse ani muscles; the third type of digitation consists in pressing the anterior lower part of the vagina, aimed at correcting the anterior deviation of the rectum, i.e. the rectocele itself. In other words, to keep vertical the direction of stool expulsion. A rectocele repair may be carried out by several techniques.

One of the simplest is the Block operation, which consists of a transanal obliteration of the rectocele with a double running suture, starting anteriorly just above the dentate line and progressing cranially until the rectocele is palpable. Aim of this suture is to increase the thickness of the recto-vaginal septum. Care has to be taken to avoid a trauma to the vagina, which has to be palpated during the procedure. A trauma may lead to a painful granuloma of the recto-vaginal septum, requiring trasperineal excision. This happened once in my experience of over a

hundred of rectocele repair. An ischemic trauma of the vagina may lead to a recto-vaginal fistula. This happened once in my experience (over 40 years) after a Sarles operation, i.e. an anterior emiDelorme. Quite surprisingly, the fistula, thin and low, became clinically evident two weeks after surgery. A successful mini-invasive approach was carried out inserting Permacol paste (lyophilized porcine collagen- Covidien, USA).

The pictures of the procedure may be seen in a Last Image Section in Techniques in Coloproctology (4).

Other operations may be carried out for rectocele, such as anterior levatorplasty,

which is advantageous in case of concomitant fecal incontinence, **but** may cause dyspareunia in sexually active women. STARR or stapled rectal resection has been carried out for rectocele and internal prolapse with good short-term results, but 20% of proctalgia at one year (5). Both recto-vaginal fistula and death due to pelvic sepsis have been reported after STARR (6). The crucial point is that, in large rectocele, the musculature of the rectum is likely to be interrupted in the midline, thus facilitating the occurrence of vaginal injury. Therefore, to me, it is better to use a manual procedure which allows a visual control of the tissue's layers during the dissection.

Occult Associated Diseases or “Underwater Rocks”

Functional

1. Psychological Disorders

Two thirds of the patients with ODS suffer from either anxiety or-and depression. This mental distress has to be diagnosed by the surgeon. Ira Kodner, one of the Past Presidents of the American Society of Colon and Rectal Surgeons, wrote that “he never performed surgery in a patient with recto-rectal intussusception prior to a psychological consultation”. If the patient is under either tranquilizers or antidepressant it is worth that he/she suffers from a mental distress. I always ask the patient if he/she feels either anxious or depressed. If so, I use to perform the Draw-the-Family graphic test, validated in proctological patients at our Unit (7). Ten parameters may be evaluated with this test, among them the position and the size of the drawing, anatomical anomalies, enlarged family etc. If the score of the test is 7 or under, we suggest the patients to see a psychologist for a psychodiagnosis. Interestingly, **almost all** the patients whose

surgical treatment of ODS failed at our Unit, had refused psychological therapy despite their evident mental distress. Therefore, **we do not operate in** a patient with a **psychiatric disease**, i.e. severe anxiety and-or depression, psychosis, bipolarity, borderline, anorexia.

2. Anismus

44% of the cases of ODS, quite high if we consider that this muscle is likely to be neglected by most general surgeons. We already discussed about the way to diagnose animus, i.e. rectal digitation, transanal ultrasound and defecography. Sphincter needle emg is no more used as is painful. For many surgeons, I would say almost all, animus is a contraindication to surgery. Instead, in our experience, it is not. In the sense that the first option in case of failure of psycho-echo-biofeedback (8) is surgery, i.e. partial bilateral myotomy of the puborectalis (9). There must be a **strict selection of those candidates to surgery**: they do not have to suffer from anal incontinence whatsoever. The operation, which is reported

in the website www.ucp-club.it, consists of a bilateral partial division of the muscle in its right and left postero-lateral side. The technique is mini-invasive as through two 1.5 cm small incisions at two sides of the anus, the two lateral branches of the puborectalis muscle are gently dissected and separated by the levator ani muscles and by the deep part of the external sphincter and then pulled down to the perianal skin (Figure 3). 70% of good functional results and no case of incontinence, no sepsis, no bleeding at three years.

An alternative to rehabilitation and surgery is to inject **Botulin Toxin A** in the muscle, but, according to our experience, it works in less than one-third of the cases.

3. Rectal Hyposensation

Frequency: around a third of patients with ODS. We already explained how to measure it. Let me just add that, a patient without the sensation of feeling stool in his-her rectum, but if you find that there are stools in the rectum... well, this patient is likely to suffer by rectal hyposensation. The mechanism is that he does not feel the stool, they remain longer in his rectum losing water, become hard and small, and thereafter are more and more unlikely to be evacuated without excessive straining. We just have to report **how to treat it**. One way is **transanal electrostimulation** taking in mind that it is contraindicated in patients who previously had anal stapling, otherwise they might have burns. **Sensory Bio-Feedback** is another way of treatment and consists in the introduction and inflation of a small balloon in the rectum, similar to that we reported for the diagnosis of rectal hyposensation. Rapid inflation of the endorectal balloon has to be carried out stepwise, increasing the air in the balloon and

encouraging the patient to feel the sensation. It is not easy to do, it needs patience and cooperation by both sides, the patient and the the physiotherapist.

4. Pudendal Neuropathy

Vaginal multiparous females who delivered heavy babies, especially if with large heads, patients who have been suffering for chronic constipation for decades and had to **strain** most of the times at evacuation (which means that they chronically stretched their perineum), patients with altered **anal reflex**, patients with **rectal hyposensation** and with shortened **voluntary contraction**, patients with **perineal descent**, patients with **diabetic neuropathy** and patients with chronic proctalgia, all of them are at risk of **pudendal neuropathy**. Measurement of **pudendal nerve terminal motor latency** using the St Mark's glove is the specific test to precisely evaluate this occult disease or "under water rock": a latency shorter than 2 msec being pathological. Pelvic and or anal heaviness or proctalgia may indicate a pudendal neuropathy. The **treatment** is difficult and often unsuccessful. It consists of strong analgesics (e.g. Lyrica), antidepressant (Laroxyl), acupuncture and hypnosis. Transanal electrostimulation may be helpful in selected cases.

5. Irritable Bowel Syndrome and Slow Intestinal Transit

Crampy abdominal pain, irregular bowel habit (constipation and diarrhoea), abdominal bloating and a palpable spastic sigmoid which obstacles the progression of the stool with its segmental contraction, may suggest the diagnosis of irritable bowel syndrome. It may be cured with probiotics, fibres, bulk laxatives, plenty of large leaves vegetables and water, psychotherapy abdominal massages, antispasmodics, music therapy.

In case the patients has the rectum empty, without stool, at digital exploration and if he/she reports less than one evacuation every three days, one may suspect a slowed intestinal transit. It may be confirmed by studying the **intestinal transit time with radiopaque markers** according to Hinton and Lennard-Jones and a daily plane x-ray of the abdomen. We recommend not to use enemas and laxatives during the investigation. The transit time is indicated by the elimination (through the stool) of 80% of the markers. This exam not only reports that

there is a slowed transit, but also which is the segment of the large bowel more responsible for the transit delay. The treatment consists of water and large leaves vegetables, bulking laxatives, hydrocolonotherapy (10), spinal cord stimulation in case of severe constipation (11). Rarely a segmental colonic resection may be advised. Total colectomy and ileo-rectal anastomosis may be carried out in cases refractory to any conservative therapy, taking in mind that nearly half per cent of the patients may suffer of abdominal pain, diarrhoea and fecal incontinence afterwards.

Organic Occult lesions or “Underwater rocks”

1. Enterocele and Sigmoidocele

It is favoured by hysterectomy, because the removed uterus is not any more a barrier able to prevent the descent of the small bowel loops down into the pouch of Douglas. Thus, small bowel may compress the rectum and become an obstacle for evacuation. This happens more easily with sigmoidocele, as it is closer to the rectum than the small bowel, that is why sigmoidocele more often represent an indication to surgery. The diagnosis of enterocele may be simple when it appears as a bulk protruding through the vagina, easily detectable at inspection and palpation during cough and strain. Transanal and transvaginal ultrasound allow to detect the enterocele in some cases, as it appears as a oval area with intestinal content inside, so with a mixed echogenicity (12-13).

When dealing with an enterocele, more than the diagnosis, what is difficult is to understand if it is responsible of the patients's symptoms and requires a surgical intervention. If so, it is necessary to **obliterate** the pouch of Douglas either laparoscopically or with a Pfannestiel incision. To prevent the formation of an igroma below

the peritoneal layer, a series of purse strings is carried out, aimed at obliterating the space below the mesh, as in the Moschowitz operation. If it is necessary, after the abdominal phase, the surgeon may correct a concomitant evident or occult lesion (e.g. a rectocele) transanally, thus using a combined abdomino-perineal approach (14). In case of concomitant recto-rectal intussusception (another “under water organic lesion”) it is possible to add a transabdominal **rectopexy** attaching the raised-up rectum to the mesh.

2. Recto-Rectal Intussusception

It consists of an invagination of the rectum and it is almost impossible to make the diagnosis either by inspection or by palpation or by means of a proctoscopy. Transanal ultrasound may allow to make the diagnosis when we see a double hypoechoic ring, represented by the invaginated rectal muscle encircling the ultrasound probe. Defecography and defeco-RMN allow a correct diagnosis. It should be noted, however, that **40% of non constipated** subjects who undergo a defecography show this condition. This means that the recto-rectal intussusception, if present, does not



necessarily require a surgical correction. I remember the late Professor Marti, from Geneva, used to say that “we have to operate the patients and not his-her x-rays”! If we need to correct a recto-rectal intussusception of clinical significance from below, we may carry out an **Internal Delorme**, excising a cylinder of prolapsed mucosa, then plicating (concertina-like) the denuded smooth muscle of the rectum and finally performing a recto-anal suture with interrupted slowly absorbable stitches. Special attention has to be paid to avoid vaginal traumas.

3. Prostatism

By “prostatism” we mean benign prostatic disorders, basically **Prostatitis** and **prostatic Hypertrophy**. Due to the close anatomical relationship between the prostate and the rectum, in case of ODS - retained stool in the rectum, a **transmural** anterior propagation of pathogenic bacteria may occur, causing prostatitis. That is why the surgeon has to take in account prostatic diseases, if any, to effectively treat the patients. Due to the fact that most ODS patients are females, prostatism is rather uncommon. It should be noted that hydrocolonotherapy or lavage, one of the therapies to treat constipation, may positively affect the germ flora both in the rectum and in the prostate and patients with prostatitis had benefitted from it at our Unit.

4. Colpo-Cystocele

Diagnostic details have been given in the first paragraphs of this paper, so we may just remind how important is a correct inspection-palpation-endoscopy of the central and

anterior department. **Colpo-cystocele was the most frequent** associated underlying occult organic disease in a group of 80 patients operated on for ODS at our Unit between 2007 and 2018, tailoring surgery to the ID. Seventy-three per cent of the patients were either cured or improved at a follow-up duration of five years. It should be noted that we operate only 14% of our patients with ODS. We recommend to all patients with colpo-cystocele to be seen by a urogynecologist. Despite a double operation for concomitant disorders of the posterior and central-anterior departments is possible, at our Unit it was carried out simultaneously just in two cases. We prefer to carry out the two procedures separately, with two operations performed in different hospital admissions.

5. Solitary Rectal Ulcer Syndrome

A middle age woman, with either recto-rectal or recto-anal intussusception, who strains at stool. This is the typical patient whose rectal mucosa may be chronically entrapped and compressed by the sphincters and is likely to develop ischemic lesions and hyperplasia of the muscularis mucosa of the rectum. There are three types of solitary rectal ulcer syndrome, one is the **Pseudopolypoid**, one the **Hyperemic** and the third the **typical solitary ulcer**, mostly on the anterior aspect of the distal rectum.

The pseudopolypoid version of the syndrome may mimic a rectal cancer. In case of repeated bleeding the patient may need an operation, usually mucosal prolapsectomy with asportation of the ulcer (or the pseudopolyp).

Conclusions

A holistic approach is needed for patients with ODS, as most of them present with a psychological distress, either anxiety or depression. A careful inspection, palpation, proctoscopy (including vaginoscopy) at rest and on straining have to be carried out in ODS patients, as often a multicompartiment disease is present. Anismus plays a relevant role in ODS, as it may affect nearly half of the patients. The primary indication is pelvic floor muscle rehabilitation, but selected cases, i.e. those with a perfect anal continence, may undergo partial bilateral myotomy of the

puborectalis muscle. A combined abdominal-perineal approach may be performed in those with ODS who have both enterocele and rectocele or-and recto-rectal or recto-anal intussusception. Rectocele and rectal internal mucosal prolapse are just the “tip of the Iceberg”, more often effects than causes of the disease. Only a minority of the patients require an operation and does not exist a gold standard intervention, as surgery has to be tailored to the ID, i.e. to the concomitant both evident and occult diseases, because all ODS patients have at least two of them.

References

1. Altomare DF, Spazzafumo L, Rinaldi M, Dodi G, Ghiselli R, Piloni V. Set-up and statistical validation of a new scoring system for obstructed defaecation syndrome. *Colorectal Dis.* 2008 Jan;10(1):84-8. Epub 2007 Apr 18.
2. Pescatori M, Spyrou M, Pulvirenti d'Urso A. A prospective evaluation of occult disorders in obstructed defecation using the 'iceberg diagram'. *Colorectal Dis.* 2007 Jun;9(5):452-6.
3. Pescatori M, Favetta U, Dedola S, Orsini S (1997) Transanalstapled excision of rectal mucosal prolapse. *Tech Coloproctol*1:96-98.
4. Pescatori M. Permacol™ collagen paste for treating a rectovaginal fistula following anterior rectal prolapsectomy. *Techniques in Coloproctology* (2017) 21:909–910 <https://doi.org/10.1007/s10151-017-1711-z>.
5. Boccasanta P., Venturi M., Stuto A., Bottini C., Caviglia A., Carriero A., Mascagni D., Mauri R., Sofo L., Landolfi V. Stapled transanal rectal resection for outlet obstruction: a prospective, multicenter trial. *Dis Colon Rectum.* 2004 Aug;47(8):1285-96; discussion 1296-7.
6. Gagliardi G., Pescatori M., Altomare DF., Binda GA., Bottini C., Dodi G., Filingeri V., Milito G., Rinaldi M., Romano G., Spazzafumo L., Trompetto M., Italian Society of Colo-Rectal Surgery (SICCR). Results, outcome predictors, and complications after stapled transanal rectal resection for obstructed defecation. *Dis Colon Rectum.* 2008 Feb;51(2):186-95; discussion 195. Epub 2007 Dec 22.
7. Miliacca C., Gagliardi G., Pescatori M. The 'Draw-the-Family Test' in the preoperative assessment of patients with anorectal diseases and psychological distress: a prospective controlled study. *Colorectal Dis.* 2010 Aug;12(8):792-8. doi: 10.1111/j.1463-1318.2009.01985.x. Epub 2009 Jun 30.
8. Del Popolo F., Cioli VM., Plevi T., Pescatori M. Psycho-echo-biofeedback: a novel treatment for anismus--results of a prospective controlled study. *Tech Coloproctol.* 2014 Oct;18(10):895-900. doi: 10.1007/s10151-014-1154-8. Epub 2014 May 25.



9. Asciore L., Pescatori LC., Pescatori M. Semi-closed bilateral partial miotomy of the puborectalis for anismus: a pilot study: Partial miotomy of the puborectalis for anismus. *Int J Colorectal Dis.* 2015 Dec;30(12):1729-34. doi: 10.1007/s00384-015-2330-7. Epub 2015 Aug 9.
10. Taffinder NJ., Tan E., Webb IG., McDonald PJ. Retrograde commercial colonic hydrotherapy. *Colorectal Dis.* 2004 Jul;6(4):258-60.
11. Pescatori M., Meglio M., Cioni B., Colagrande C. Colonic motility in two constipated neurological patients treated by spinal cord stimulation. In: Wienbeck M (ed), *Motility of the digestive tract.* Raven Press, New York, 1982 pp 541–547.
12. Brusciano L., Limongelli P., del Genio G., Rossetti G., Sansone S., Healey A., Maffettone V., Napolitano V., Pizza F., Tolone S., del Genio A. Clinical and instrumental parameters in patients with constipation and incontinence: their potential implications in the functional aspects of these disorders. *Int J Colorectal Dis.* 2009 Aug;24(8):961-7. doi: 10.1007/s00384-009-0678-2. Epub 2009 Mar 7.
13. Brusciano L., Limongelli P., Pescatori M., Napolitano V., Gagliardi G., Maffettone V., Rossetti G., del Genio G., Russo G., Pizza F., del Genio A. Ultrasonographic patterns in patients with obstructed defaecation. *Int J Colorectal Dis.* 2007 Aug;22(8):969-77. Epub 2007 Jan 10.
14. Pescatori M. Long-term follow-up of simultaneous abdominoperineal repair of enterorectoceles and internal mucosal prolapse. *Dis Colon Rectum.* 2009 Feb;52(2):327-35. doi: 10.1007/DCR.0b013e31819a21d8.