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6.1 Fecal Disorder Rehabilitation

The conservative management of defecation disorders in adults is based on education and lifestyle interventions, diet and fluid intake, bowel management, and retraining programs. The rehabilitative treatment of fecal incontinence and obstructed defecation is the first-line therapy in patients who have not responded to simple dietary programs and medication [1, 2]. Anal electric stimulation, biofeedback, pelvic floor muscle training, and sensory retraining have been used to treat the symptoms of people with these fecal disorders. Nevertheless, because there are no international agreements on the use of these various rehabilitative techniques, the main problems in this field are related to the absence of standards and guidelines. Moreover, rehabilitation requires a highly trained therapist and is time-consuming both for the therapist and the patient. Therefore, the patient must be strongly motivated. In spite of these negative factors, rehabilitative treatment has a high success rate of about 70 %, and the patient's quality of life after treatment is significantly better than it was before [3, 4].

The aim of this chapter is to describe rehabilitative techniques and their clinical impacts on fecal incontinence and obstructed defecation.

6.2 Anal Electrical Stimulation

Anal electrical stimulation was first described about 50 years ago for the treatment of fecal incontinence [5, 6]. Skin or intra-anal plugs, connected to clinical work stations or portable devices, have been used, and the rehabilitative treatment is usually

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performed daily for some months by the patient in a home environment. The purpose of anal electrical stimulation is to induce muscle contraction by direct stimulation or indirectly via peripheral nerve stimulation. The device delivers a square wave of current alternating between a period of a few seconds of work and a double rest period, according to a standard sequence of pulses (width in ms; frequency in Hz) reported in a printed instruction sheet that is given to patients. There is at present no experimental evidence to guide optimum electrical stimulation parameters for different symptoms and clinical conditions. Therefore, there is no universally accepted protocol, and electrical parameters that can be used for anal stimulation vary among centers: the work and rest periods, width and frequency of pulses, and ramp up and ramp down of waves are not standardized. A stimulator is usually used for 20 min daily, but it can be applied twice/day: however, regular outpatient monitoring is needed to verify the application of electrical stimulating protocol. How electrical stimulation works on anal function has not yet been defined. It is postulated that chronic axonal stimulation increases the efficacy of neuromuscular transmission, activates dormant axons, and increases the conduction rate of pudendal nerves [7]: the effect seems to be an improvement in anal and perineal awareness [8]. Several uncontrolled studies have reported clinical benefit of anal electrical stimulation when used in patients affected by fecal incontinence [9–11]. On the contrary, other studies have not shown any therapeutic advantage and have underlined the superiority of biofeedback when compared to electrical stimulation [12–14]. A Cochrane review of trials of electrical stimulation for fecal incontinence concluded that “At present there are insufficient data to allow reliable conclusions to be drawn on the effects of electrical stimulation in the management of fecal incontinence. There is a suggestion that electrical stimulation may have a therapeutic effect, but this is not certain” [15]. So, on the basis of currently available evidence, it is not possible to recommend electrical stimulation for fecal incontinence [2]. On the other hand, electrical stimulation, when used in combination with biofeedback and sphincter exercises, enhances their effects [16–19]. A recent review concluded that there is sufficient evidence of the efficacy of the combination of biofeedback plus electrical stimulation in the treatment of fecal incontinence [20].

Isolated reports point to the positive use of electrical anal stimulation in patients affected by obstructed defecation [4, 21, 22]. The same remarks, made for electrical anal stimulation used in patients affected by fecal incontinence, are valid also for this topic.

6.3 Biofeedback

Biofeedback is considered to be an operant conditioning technique for the defecation reflex [23]. It consists of sphincteric coordination exercises together with visual/verbal feedback training: it employs a trial-and-error process whereby learning takes place and the patient must be aware of the desired response (signals). Biofeedback training is aimed at improving voluntary external anal sphincter contraction and relaxation [24, 25] and restoring the synchrony of internal and external

sphincter response during rectal distension [26]. Biofeedback may make use of electromyographic or pressure devices in the clinic using a working station or at home by means of portable electronics, but there is no standardization: instrumentation, training procedures, and operative protocols differ between one center and another. Because of this, it is very difficult to compare rehabilitative outcomes. Biofeedback, either alone or in combination with other rehabilitative techniques [27, 28], is generally attempted only after pharmacological therapy has failed in the treatment of defecation disorders. The response rate, which includes both symptom improvement and cure rates, ranges from 50 to 80 % in the treatment of fecal incontinence [2] and from 35 to 75 % in patients affected by obstructed defecation [29, 30]. Clinical improvement is maintained in the long term, but continuing exercises are needed to sustain the success rate [28, 31].

6.4 Pelvic Floor Muscle Training

The aim of pelvic floor muscle training is to improve performance, extension, and elasticity of the levator ani and perineal muscles. The main targets of pelviperineal rehabilitative exercises are on resting tone and voluntary contraction/relaxation of the puborectalis muscle that becomes strengthened and coordinated. Post-defecatory reflex and the stress abdominoperineal reflex also become more effective. These results are achieved by means of sequential exercises performed weekly in outpatient sessions. Usually, pelvic floor muscle training is combined with biofeedback [27, 32]. The variety and sequence of pelviperineal exercises are not standardized and each clinic dedicated to pelvic floor rehabilitation has its own treatment protocol. However, some rehabilitative steps may be proposed. After a preliminary lesson on relaxed breathing and corporeal consciousness, the patient is taught to locate and focus on agonist, antagonist, and synergic muscles on the perianal plane. The next main steps of pelvic floor training are anteversion and retroversion pelvic movements, anal contractions/relaxations, perianal and perivaginal stretching, stretch reflexes of the puborectalis muscles, abdominopelvic synergy, and finally anal corticalization [19, 27]. Pelvic floor muscle training is mainly used in patients with obstructed defecation who have pelvic floor dyssynergia, because it is specific training for uncoordinated pelvic floor muscles [27, 33]. It is also used in patients with fecal incontinence and pelvic floor defects [19] or descending perineum syndrome [34]. The success rate is high: symptom severity and quality of life improve in about 90 % of patients affected by pelvic floor dyssynergia, and the results are long-lasting [4, 33].

6.5 Sensory Retraining

Defective rectal sensitivity may be involved in obstructed defecation and fecal incontinence [35, 36]. Intact rectal sensation plays a key role in fecal continence and normal defecation: a normal perception of fecal bolus and gas sustains basal

continence and is decisive in triggering and maintaining defecation. Rectal hypo-sensitivity [37] and rectal hypersensitivity [38] are the pathophysiological mechanisms which impair rectal sensation. Sensory retraining is thus aimed at restoring the defective rectal sensitivity. Hyposensitivity and hypersensitivity occur when sensory threshold values fall outside normal limits: hyposensitivity is detected when the manometric sensory threshold is higher than normal values, hypersensitivity when the threshold is lower. Retraining of the rectal sensory threshold, restoration of elastic properties of the rectum, and retraining of external anal sphincter response to rectal distension are the targets of sensory retraining. Such rehabilitation treatment may be performed through biofeedback [39], an inflated balloon [40], or water enemas of decreasing/increasing volume [19]. Unfortunately, evidence of targeted therapy on defective rectal sensitivity is lacking, with no randomized controlled trials available. However, sensory retraining has been shown to objectively improve symptoms in up to 92 % of patients [37] and subjectively improve obstructed defecation [29, 41] and incontinence [42] with sustained improvement for at least 12 months [43].

In conclusion, the rehabilitative treatment of fecal disorders is a good therapeutic option: many patients improve and some of them become symptom-free. Moreover, rehabilitation offers a harmless mode for identifying those “nonresponder patients” who should be next in line for more invasive and expensive therapeutic procedures (sacral neuromodulation, surgery).

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