Relaxation Biofeedback Conditioning as Treatment of a Disturbed Defecation Reflex

Report of a Case

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The case history is presented of a patient with a disturbed defecation reflex by viral encephalopolyradiculoneuritis. The inability to defecate was thought to be due to hyper-reflexibility and, hence to increased spasm of the external anal sphincter. Normal defecation was eventually brought about by an operant learning technique, as described originally by Haskell and Rovner. The patient was conditioned to relax his external anal sphincter once he felt rectal fullness and the urge to defecate. Defecation was initiated by a Dulcolax® suppository. [Key words: Anal incontinence; Biofeedback; Obstipation]

DISTURBANCE of the normal defecation process may lead to serious social consequences. Young people, in particular, with such a condition are condemned to an isolated life and they can easily become social cripples. Defecation includes almost all mechanisms that are also necessary for, and involved in, the maintenance of normal fecal continence. The mechanisms include a sensory organism for stimulation by intraluminal contents, reservoir capacity of the rectum, and sphincter contraction.

The anal sphincters consist of an internal sphincter, the voluntarily controlled external sphincter, and the pelvic floor muscles. The nerve system comprises sensory organs within the bowel wall, an intact afferent and efferent reflex arch within the external pudendal nerve, and the pathway to the central cortex.

It is clear that injury to these mechanisms will cause serious impairment of normal fecal continence. On the other hand, patients with neurologic deficiencies may also experience great difficulty in the normal defecation process. As early as the beginning of this century, it was shown that inefficient defecation can be caused by underlying neurologic pathology resulting in stasis of feces in the rectal ampulla.

In their elaborate study, Denny-Brown and Robertson showed that, in patients with spinal cord lesions, evacuation of the rectum was hampered by absence of the normal rectal sensation and defecation reflex, together with disturbance in the voluntary sphincter control.

Reported is a patient with a disturbed defecation reflex caused by viral polyneuritis treated successfully with a relaxation biofeedback conditioning, as originally outlined for the treatment of fecal incontinence by Haskell and Rovner.

**Report of a Case**

In 1971, a 20-year-old man acquired encephalomyelopolyradiculoneuritis and paresis from segment C7 onward, as a complication of influenza type A. Although the acute condition improved gradually, the eventual course was rather complicated.

In 1972, he underwent urinary deviation by means of a Bricker procedure. The impotensia erigendi persisted and he had serious problems with defecation; he was completely unable to excrete feces in a normal manner. On sensation of a filled rectum, the feces had to be removed digitally. This rather painful procedure had to be repeated a couple of times per day and in the end caused rectal hemorrhage.

There was unsuccessful use of enemas, laxatives, and rectal suppositories. During the last few years, there had been hemorrhoidal prolapse occasionally leading to hemorrhage. As a result of his condition, he was completely incapable of performing normal work and hence had to rely on social welfare. He was referred to us for treatment of his constipation and hemorrhage.

**Neurologic Investigation:** The patient showed wasting of gluteal, calf, and quadriceps muscles. Sensibility of the lower part of the body was intact, especially over the sacral skin segments. There were moderate spastic paralysis of both legs and of the abdominal wall musculature. The knee and ankle jerks were pathologically active. A clonus could be provoked.
Anal Investigation: The anal cutaneous reflex and bulbocavernous reflex were increased. There was a mild rectal prolapse with a vulnerable internal hemorrhoid. At digital examination, there was a strong sphincter tension that abated quite quickly. There was hardly any palpable voluntary contraction of the external sphincter.

Anorectal Manometry: Anorectal pressures were evaluated with a rapid pull-through technique with a side open continuous perfused catheter. Pressures from the external and internal sphincters and distal rectum were recorded and displayed on both a direct writing instrument and an oscillating scope. At rest a tonus was recorded of 82 mm Hg (Fig. 1A). An attempt at voluntary contraction of the external sphincter did not raise the basal pressure. When the intraluminal rectal balloon was inflated, the patient was aware of a filling sensation in the rectum. At the same time, a clear rectal sphincteric inhibition reflex of the internal sphincter could be shown (Fig. 1B).

After evaluation of the results, we decided to subject the patient to the following relaxation biofeedback conditioning protocol with the aid of an intrarectal balloon, as described by Cerulli et al.6

When the balloon was inflated with up to 100 ml of air within the rectal ampulla, the patient was asked to use his abdominal wall musculature when a rectal sensation was felt. At that particular moment, an assistant gradually retracted the balloon. This protocol was performed clinically and was repeated three times daily. In the end, our patient succeeded in expelling the water-filled balloon without further help.

In the early training period, the defecation reflex was also initiated with the aid of an enema. Later on, the patient had successful defecation with a Dulcolax® suppository.

After three weeks of intensive training, the patient achieved normal defecation enhanced by a Dulcolax® suppository once or twice a day. A few days before discharge, hemorrhoidectomy was performed. The postoperative course was uneventful.

Six months after discharge, our patient was completely satisfied. Defecation, initiated with a Dulcolax® suppository, was experienced once or twice a day.

Discussion

Under normal conditions, continence is maintained by means of various reflex mechanisms, including the cough reflex, anocutaneous reflex and rectal-sphincteric reflex, all adding up to a short-term increased tonus (i.e. 3 minutes at most) of the voluntarily controlled external sphincter. These reflexes are conditioned and learned during early infancy. These normal and very useful reflexes have an important bearing on our patient.

At neurologic examination, there appeared to be spastic paresis. Since the anocutaneous as well as the bulbocavernous reflex were present and since it was also possible to elicit a rectal sphincteric inhibition reflex, it can be concluded that the reflex arc, necessary for the evacuation of feces, was intact.

However, there were probably various factors which caused the chronic obstruction. First of all, there was a spasm of all his voluntarily controlled muscles from the abdominal wall musculature downward to his legs and feet, including the pelvic floor muscles and external sphincter ani. These spasms were caused by the absence of inhibitory action of the corticospinal pathways, i.e. the pyramid tracts. In this way, any mild stimulus, which would normally go unnoticed, led to forceful contraction of the external sphincter. In this context, the attitude of the patient himself, with a marked preoccupation about his defecation, would probably also be of importance.

Due to slightly disturbed control over his normal motor activity, he is incapable of complete control of his abdominal wall and pelvic floor musculature. Accumulation of feces in the rectosigmoid and disturbed evacuation will eventually lead to impaction of feces which, in itself, impedes the normal defecation process.

This very specific training program was focused on deconditioning the normal external sphincter contraction once a sensation of filling was experienced in the