Section of Proctology

President Robert Cooke CHM

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Paper

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The Syndrome of the Descending Perineum

As the result of a study of the disordered physiology of patients with rectal prolapse a distinct condition has been recognized which we have called the syndrome of the descending perineum. It is not a wholly satisfactory title but is descriptive, as perineal descent on straining is both the cause of the symptomatology and the most obvious physical sign. As this is an abnormality of anorectal function it is first necessary to consider the normal mechanism of defæcation and anal continence.

Normal Physiology
The anorectal junction is controlled by the joint effect of the two sets of sphincter muscles. It is well known that the internal anal sphincter, which is a visceral muscle, has a constant and well-maintained tone. The external sphincters and levator ani muscles also have a tonic activity, the result of a spinal reflex (*vide infra*). Recently, Phillips & Edwards (1965) have cast considerable doubt upon the ability of the sphincters alone to control the passage of rectal contents through the anal canal and have advanced a new hypothesis to account for the efficiency of the anal mechanism. They suggest that, at best, the anal sphincters only partially close the canal and that the final closure is brought about by mucosal flaps forced into position by the pressure gradient between the abdominal cavity and the external environment. As these folds are kept in position by intra-abdominal pressure any increase in that pressure such as may occur during coughing or straining will only serve to increase the efficiency of this action. The mechanism will be unlocked by gut contents being propelled down the rectum to the upper anal canal thereby dislodging the mucosal folds.

We believe that Phillips & Edwards' hypothesis is correct in principle. However, there is probably an additional factor present at the anorectal junction. The rectum does not enter the anal canal directly but its lowest portion turns forwards almost at a right angle and this is continued into the anal canal as another right-angled turn. We believe that the mucosa of the anterior rectal wall just above the anal canal falls into position over the canal as a flap valve; a rise in intra-abdominal pressure will therefore force this anterior wall even more firmly on to the upper anal canal and so occlude it more effectively (Fig 1). When an

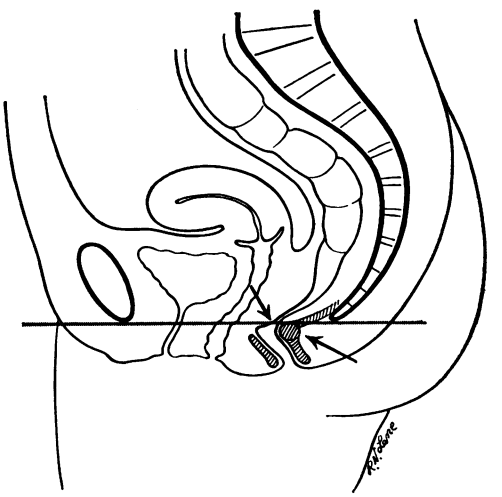

Fig 1 *Diagram to show the pelvic floor in its normal relation to the pubococcygeal line. The normal anorectal angle is well shown as is the valvular effect of the anterior wall mucosa. Contraction of the puborectalis will reinforce this effect*

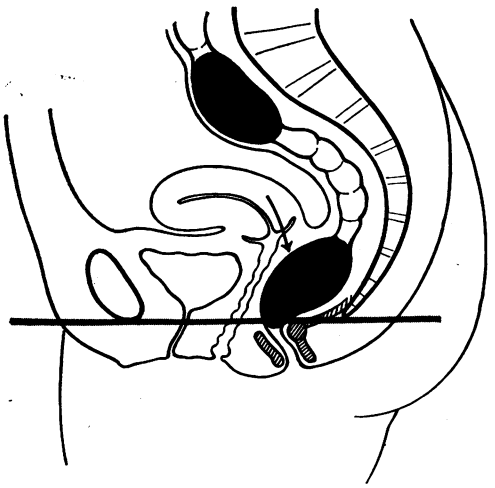

Fig 2 *To show the effect of straining when there is a stool in the rectum. The pelvic floor is still at the normal level*

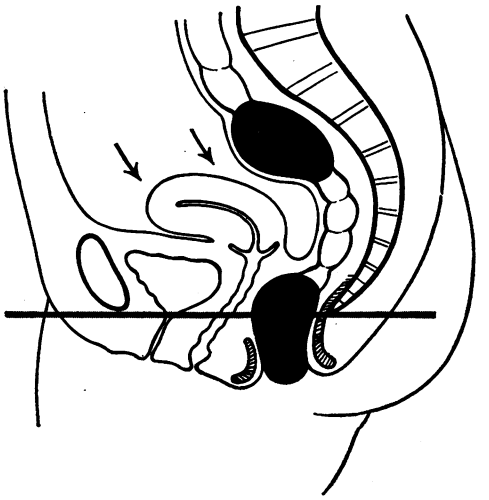

Fig 3 *As a result of abdominal straining the stool is forced into the anal canal. The anorectal angle is obliterated and the pelvic floor has dropped markedly*

involuntary rise in intra-abdominal pressure occurs, such as during coughing or lifting, there is a reflex which causes the pelvic floor muscles to contract vigorously. This raising of the pelvic floor during activity ensures that the valve mechanism functions efficiently and that no leakage occurs.

The mechanism of rectal evacuation is not properly understood, but by analogy with other viscera it is likely that peristaltic activity plays a part in normal circumstances. Pressure studies have not demonstrated convincing peristaltic waves in the rectum but I Kelsey Fry (1966, personal communication), using cineradiology, has evidence that rectal wall contraction plays an active part in normal defæcation. Fæcal contents are driven into the lower rectum by contraction of the sigmoid colon, the distension resulting in muscular contraction of the lower rectum and a conscious desire to defæcate. We have shown that, if the time is appropriate and defæcation takes place, the tone of the anal sphincters is diminished and the stool moves into the anal canal. In doing so it dislocates the mucosal valve or valves and negotiates the partially straightened anorectal bend without difficulty. Phillips & Edwards (1965), using cineradiography, have shown that the pelvic floor descends during the process, but not excessively in the normal patient. The anorectal S bend is thereby partially straightened but it is not obliterated.

Using the technique of electromyography it has been shown that the external sphincters have a constant resting tone due to the spinal reflex mechanism (Floyd & Walls 1953, Parks *et al.* 1962). It is this tonic contraction of the pelvic floor muscles which maintains the anorectal angle with its valvular mechanism. During defæcation the sphincter tone is abolished and the anal canal reflexly relaxes. As soon as the contents have passed there is a sharp contraction of the sphincters and levator ani muscles so that the pelvic floor is elevated to its original position, the canal closed and the valve mechanism restored. This is called the post-defæcation reflex.

Disordered Physiology

In some people rectal emptying does not occur with normal facility, due to causes which we do not yet understand. In these circumstances a person may resort to excessive abdominal straining. Normally, on straining the anterior rectal wall is forced on to the upper anal canal more firmly but does not protrude into it. If abdominal straining is excessive, pelvic floor muscle tone diminishes and may disappear altogether; the whole floor descends and becomes funnel shaped due to stretching of the pubo-rectalis and the upper part of the sphincter muscles (Figs 2 & 3). Fæcal material in the lower rectum is forced into the funnel-shaped anorectal region and ultimately expelled. The force of expulsion is carried mostly through the anterior rectal wall which, after the fæcal lump has been evacuated, itself tends to follow through the anal canal. If the normal person has cleared the rectum by straining, a sharp post-defæcation reflex contraction of the whole pelvic floor closes the canal and restores the anorectal angle and prolapse of

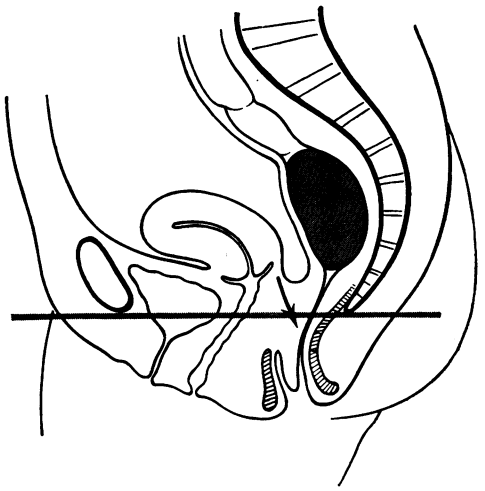

Fig 4 *The pelvic floor is still dropped. In the absence of an effective post-defæcation reflex with restoration of tone of the pelvic floor, anterior wall mucosa bulges into the upper anal canal. The direction of abdominal force which expelled the stool also causes protrusion of the rectal mucosa*

the anterior rectal wall is prevented. Abdominal straining is such a potent inhibitor of pelvic muscle tone that if the person persists in straining at stool over many years the effectiveness of the post-defæcation reflex will be considerably reduced. In these circumstances anterior rectal wall mucosa bulges into the anal canal, where it gives the sensation of another fæcal lump; further straining then follows in an effort to pass it. If this straining is repeated and prolonged, anterior rectal wall mucosa will ultimately protrude (Fig 4).

Symptomatology

Once this stage has been reached symptoms of varying severity occur. During the straining effort of defæcation the stool is passed, followed by the anterior rectal wall mucosa. This occludes the anal canal and prevents further defæcation by straining. The patient then gives the typical story that, after partial emptying of the rectum, a sense of obstruction develops which he cannot overcome except by ceasing all straining. He then makes a similar attempt with similar results. This repetitive bowel action is one of the characteristic features of this syndrome and sometimes amounts to frank tenesmus. In addition, a vague dull aching pain, experienced generally in the perineum and in the region of the sacrum, may follow defæcation. This is due to the anterior rectal wall mucosa in the upper anal canal and the patient may continue straining in an endeavour to relieve it: his efforts make the situation worse. The mucosa which prolapses becomes irritated and secretes mucus causing perineal moisture, soreness and irritation. This combination of tenesmus and the passage of mucus suggests the diagnosis of carcinoma. The prolapsed mucosa may bleed, which is another symptom causing anxiety. Diminished pelvic floor muscle tone results in permanent descent of the perineum, external sphincter competence is diminished and the efficiency of the mucosal valve action reduced. Anal leakage occurs with soiling of the clothing and secondary pruritus. Occasionally partial incontinence is found, usually the need for urgency as soon as rectal sensation occurs.

Physical Signs

On examination of a patient with this condition certain characteristic features can be observed. In the normal person the anal margin lies just below a line drawn between the coccyx and the symphysis pubis. In patients with the syndrome the anal canal is either situated several centimetres below this line or it rapidly descends three to four centimetres when a straining effort is made. This descent is due to the sudden relaxation of the pelvic floor muscles, something which the normal person finds almost impossible to do; when the descent is maximal, the anal mucosa may pout and if the patient has piles they will usually prolapse. On digital examination there may be an obvious lack of muscle tone or it may appear to be normal. However, in most cases the muscle tone is easily overcome by posterior traction with the examining finger; the anus gapes. The most characteristic change occurs when the patient is asked to strain; the puborectalis descends sharply and can no longer be felt as a separate bar constituting the anorectal ring. The upper anal canal becomes funnel shaped and the anterior rectal wall is pushed down on to the examining finger. On proctoscopy, during straining, the anterior wall bulges down into the instrument and follows it as it is withdrawn.

In elderly people with weak pelvic floor muscles the whole pelvic floor may be dropped permanently and the anal canal is then shallow. In these patients there is little to prevent mucosal bulging and indeed there seems to be no sharp line of demarcation between such patients and those with true rectal prolapse. We were tempted to regard patients with this syndrome as being in a pre-rectal-prolapse state: this may be so, but there are far too many of them and far too few with complete rectal prolapse for this succession of events to be common.

Electromyographic Studies

We have studied 40 patients with this syndrome electromyographically. Their ages range from 8 to 72 years. In the normal person there is at first increased electrical activity in the sphincter muscles on straining, followed after several seconds by inhibition which may be partial or complete; as soon as the straining ceases there is a sharp return of exaggerated activity which is called the closing reflex. In patients with a descending perineum a different picture is seen (Fig 5A, B): the postural reflex, that is the continuous activity of the pelvic floor at rest, is usually normal but in extreme cases may be diminished or absent; on straining, inhibition occurs at once, the pelvic muscles are relaxed or 'unlocked' much more easily and allow rapid pelvic floor descent; reflex recovery after straining may be delayed or grossly diminished and in some cases resting activity disappears for a considerable time.

Stretching the anal canal in the normal patient with an examining finger produces a continuous increase in sphincter activity. In patients with the descending perineum syndrome the reverse occurs and inhibition takes place, electrical activity (as seen on electromyography) ceases and the anal canal dilates. The only other patients (excepting those with complete rectal prolapse) in whom stretching of the anal canal produces relaxation are those with complete spastic paraplegia (Melzak & Porter 1964).

In normal patients distension of the rectum with a balloon filled to about 150 ml produces relaxation of the pelvic floor muscles and the desire to defæcate arises (Fig 6). Some patients with a descending perineum tolerate much larger volumes without any rectal sensation being experienced. It is possible that in some members of the group rectal overloading occurs so that the patient has to resort to excessive straining with resultant weakening of the pelvic floor muscles. A history of straining is usual in these patients.

In an attempt to assess the frequency of the condition the degree of perineal descent was measured in 100 consecutive patients attending a rectal clinic. The position of the anal margin in relation to the pubococcygeal line was measured at rest and during straining (Table 1). It is apparent that in those patients with an excessive degree of perineal descent there is usually a history of straining and difficulty in defæcation. The patients examined were not, of course, a representative sample of the general population as they all had rectal or colonic complaints. Nevertheless, it is of interest that just over 10% had excessive perineal descent and, of these, three-quarters had abnormal bulging of the anterior rectal wall mucosa.

Table 1

Correlation between certain symptoms and signs with the degree of descent of the anus on straining in 100 patients

	Patients with perineal descent > 2·5 cm or resting level below 3 cm		*Patients with perineal descent < 2·5 cm*	
	No.	*%*	*No.*	*%*
Total	12		88	
Males	7		59	
Females	5		29	
Excessive straining to open bowels	10 (2 manual removal)	83	20	23
Bowels open easily	1		68	77
Incontinence	1		0	
Defæcation time > 5–10 min	8	67	9	10
Excessive anterior mucosal bulge	9	75	18	20
Age (years):				
10–20	0		6	7
20–30	2	17	14	16
30–40	2	17	14	16
40–50	3	25	23	26
50–60	1	8	17	19
60–70	3	25	9	10
70–80	0		5	6
80–90	1	8	0	

Treatment

Treatment of these patients, if initiated at an early stage, may cause remission of symptoms. Although most of them have permanent changes in their pelvic floor by the time they present, the effects of this may be minimized by sensible management. The chief aim in treatment is to prevent further damage by eliminating all straining during defæcation. Laxatives are of only limited use as many of these patients have persistently liquid stools; a combination of liquid stool with lax sphincters causes soiling and sometimes partial incontinence. In those where the stool is hard the patient is instructed to use liquid paraffin or a hydrophilic laxative sufficient to soften it but not to give rise to diarrhœa. Usually the most successful method of facilitating rectal emptying in patients with this complaint is by means of an irritant suppository such as glycerin or bisacodyl. Glycerin suppositories usually suffice and they must be used daily unless spontaneous bowel action returns without straining. The next step is to stop the straining efforts which are made due to the tenesmus resulting from anterior wall prolapse. The origin of these repeated calls to stool is explained to the patient and he is told that once his bowel has been emptied satisfactorily all further calls should be ignored. The muscle weakness can be at least partially corrected by sphincter exercises, supplemented in the first instance by faradism. It takes

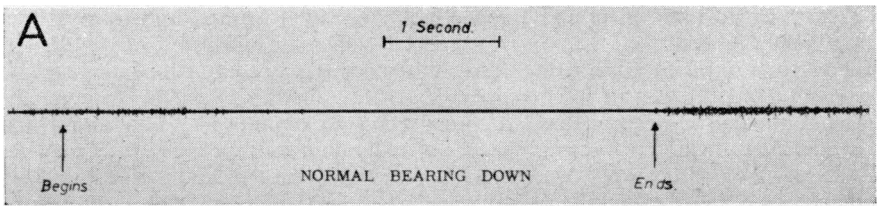

Fig 5A *Bearing down commences at the first arrow; this is followed by a slight increase in activity. After two seconds the voluntary muscles are inhibited. At the second arrow bearing down ceases and there is a sudden return of activity which is of greater frequency and amplitude than was present originally*

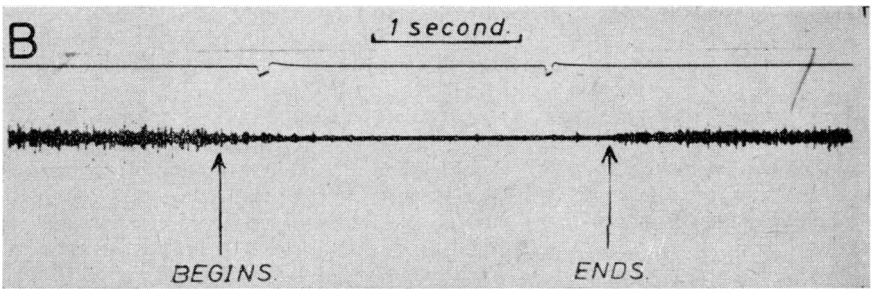

Fig 5B *In a patient with the descending perineum syndrome inhibition occurs almost immediately on bearing down and there is no initial increase of activity. The activity which appears when bearing down ends builds up slowly to the original resting level*

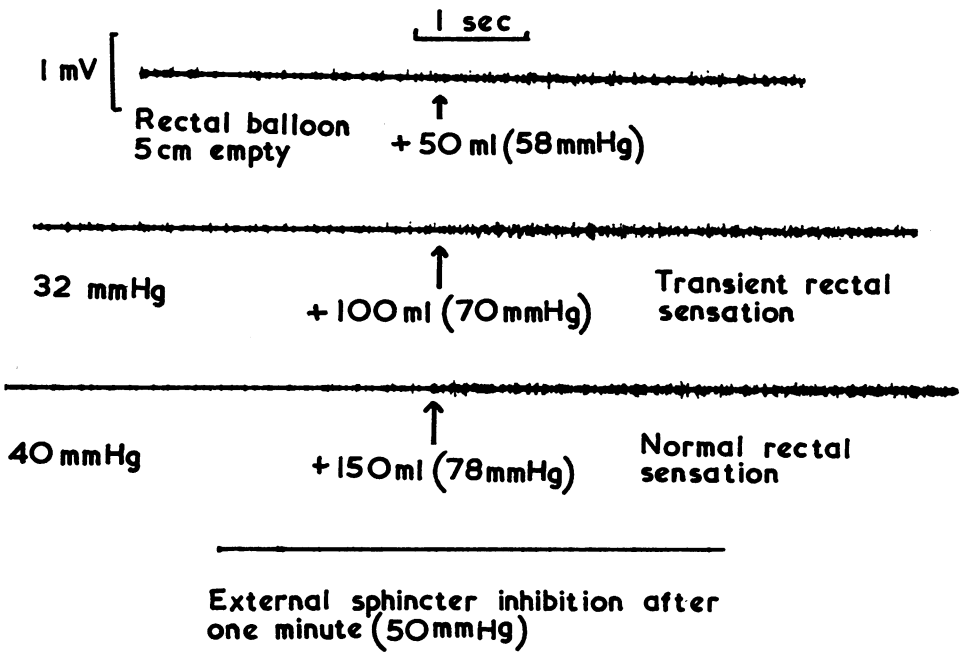

Fig 6 *Balloon distension of the rectum. An intra-rectal balloon is filled with successive additions of 50 ml air. After a volume of 150 ml has been reached the voluntary pelvic muscles relax completely, as shown by absence of all activity on the electromyogram, and the patient has a normal desire to defæcate*

many weeks before exercises have any effect and they must be continued indefinitely. These measures are designed to prevent further weakening of the pelvic floor and if possible restore some of its tone. Finally, it is possible to relieve some of the effects due to the prolapsing anterior rectal wall. An injection of arachis oil with phenol 5% placed in the submucosa of the anterior rectal wall well above the hæmorrhoidal area helps greatly in preventing prolapse: it will stop the bleeding, together with the mucus discharge and usually relieves the sensation of tenesmus. It may have to be repeated. The above regime will relieve most people but if they resort to their straining habits, symptoms will usually recur.

Discussion

Those patients whose chief complaints are tenesmus and obstructive constipation cause the most alarm, because their symptoms are suggestive of a carcinoma of the rectum. It is satisfying to be able to make a benign diagnosis and to give rapidly effective treatment.

The combination of soiling, bleeding and mucosal prolapse on straining suggests the diagnosis of hæmorrhoids and this confusion must occur frequently. An extended hæmorrhoidectomy, with removal of more lower rectal mucosa than usual, will benefit the patient with the descending perineum syndrome as it will, at least temporarily, prevent mucosal prolapse. It is important that a generous quantity of anterior rectal wall mucosa be taken.

Many patients with this syndrome have large hæmorrhoids as well. Third-degree prolapse occurs at the slightest provocation because of the weak and ineffectual pelvic floor muscles. Injection therapy is disappointing and hæmorrhoidectomy is nearly always necessary to give relief. Operation is not the end of treatment: it is essential that the patient follow the routine suggested above, in the section on conservative management.

Another corollary is that the descending perineum syndrome is the usual cause of so-called recurrence after hæmorrhoidectomy. After a technically adequate operation has been performed the patient may complain of soreness and perhaps a little bleeding; on proctoscopy the anterior rectal wall bulges markedly and a diagnosis of redundant mucosa is made. Symptoms usually respond to an injection of oil and retraining of bowel function but occasionally further excision of mucosa is required. Bennett *et al.* (1963) noted that mild incontinence was found after hæmorrhoidectomy in about 26% of patients; they attributed this to the operation. Tagart (1966) has shown that incontinence of this degree was present beforehand in about 25% of patients with hæmorrhoids requiring operation. It is our belief that these patients have the descending perineum with associated hæmorrhoids.

Patients with this syndrome who have no hæmorrhoids are often a matter of concern to their surgeon or physician: they may complain bitterly of symptoms but little abnormal is found on examination. It is only when they are asked to strain that the tell-tale anterior rectal wall changes become obvious. Constant, rather vague perineal pain or aching is a difficult complaint to elucidate. They may be diagnosed as neurotic and their relief when told that they have a treatable, functional disorder is considerable. All diagnostic measures necessary to rule out disease in the lower bowel must be taken before these symptoms can be safely ascribed to the descending perineum syndrome.

This syndrome is still largely based on clinical impressions. Further studies in pelvic floor physiology may reveal the extent to which abnormalities of function occur and so give us a better understanding of how to treat them.

REFERENCES

Bennett R C, Friedman M H W & Goligher J C (1963) *Brit. med. J.* ii, 216
Floyd W F & Walls E W (1953) *J. Physiol.* **49**, 121
Melzak J & Porter N H (1964) *Paraplegia* **1**, 277
Parks A G, Porter N H & Melzak J (1962) *Dis. Colon Rect.* **5**, 407
Phillips S F & Edwards D A W (1965) *Gut* **6**, 396
Tagart R E B (1966) *Brit. J. Surg.* **53**, 53