The Diagnosis of Outlet Constipation
by Defecography

Department of Colorectal Surgical Center and Radiology, Changhai Hospital, The Second Military Medical College, Shanghai, China

Yu De-hong  Lu Ren-hua

Defecography has greatly increased our knowledge of the functional outlet constipation. But it should be used in conjunction with manometry, electromyography and colonic transit time study to evaluate fully defecatory mechanism.

The etiology of obstinate constipation is very complicated, also the diagnosis and treatment are very difficult. Recently, by using defecography and some colorectal tests, such as anal and rectal pressure measurement, EMG recording of the pelvic floor skeletal musculature, and colonic transit time study, we discovered a series of outlet constipation. Some obstructive factors in outlet areas are characteristic of this constipation. This obstruction can be treated by surgery with good results.

Now, we report the results of defecography and discuss its clinical value.

Material and Method

1. Materials
From 1985 to 1987, we have done 500 cases (523 examinations) defecography. Normal control group (70 cases) consisted of 49 males and 21 females, varying in age from 18 to 71 years. Abnormal group (430 cases) consisted of 115 males and 315 females, aging from 6 to 84 years. Their complaints were constipation (bowel movement every 3 to 30 days, average 7 days), difficult with defecation, discomfort, pain and distension. Most defecations were induced by enema or medication. Clinical examinations were normal except defecography. Clinical examinations were normal except defecography.

2. Examination methods
1) Preparation of patients: Same as barium enema. In order to delineate small bowel loops in the pelvis, 150 ml of 75 % barium mixture is given orally, 2-3 hours before defecography.
2) Contrast medium: The contrast medium is prepared by diluting 150 ml. of a 75 %-100 % wt/vol barium suspension with 400 ml. of water.
3) Position of patient: Patient in lateral sitting position (using special seats). Take anorectal film at rest, during squeezing, lifting, straining, during and at the end of defecation. The film should include the ano-coccygeal region, the pubic symphysis and the anus.

3. Observations
1) The anorectal angle: This is the angle between the luminal axis of the anal canal and a line drawn along the lower border of the distal rectum. It can be measured at rest, during straining and during defecation.
2) Pelvic floor descent: At rest, this is the vertical distance between the pubo-coccygeal line and upper part of anorectal junction (upper anal distance). The descent on straining is the difference between the position of the anorectal junction at rest and straining.
3) The distance between the sigmoid (or small intestine) to the pubo-coccygeal line. Measure the vertical distance between the lower border of barium-filled sigmoid or small intestine to the pubo-coccygeal line. Normally, the lower border of the intestinal loops is above the pubo-coccygeal line.
4) Changes in the configuration of the rectum, such as rectocele formation and intussusception.

4. Results
Control group: The normal Chinese ano-rectal angle (Fig. 1) is 96.53±12.22 degrees (62-123) at rest, 116.32±14.93 degrees (94-151) during straining. Upper anal distances is 9.9±6.47 (-10-23) mm at rest, 20.74±9.57 (-5-47) mm during straining. 82.86 % < 25 mm, 91.43 % < 30 mm.

Abnormal radiological signs include:
1) Descending perineum syndrome (DPS): DPS means the upper anal distance is ≥ 26 mm during straining. Our group is 27-68 mm. Most cases combine with other abnormal signs.
2) Anterior rectal mucosa prolapse (AMP): Prolapse of the anterior rectal wall with intussusception during straining, but the posterior part of ano-rectal communication is smooth.

3) Internal rectal intussusception (IRI) (Fig. 2): Rectal intussusception can be divided into: a. Rectorectal with infolding of the full thickness of the rectal wall so that the upper rectum descends into the flattened distal rectum. This is associated with separation of the rectum from the sacral promontory. b. Rectoanal: The upper rectum enters the distal anal canal. These two types of internal intussusception present on defecography with a typical funnel-like configuration of the intussusception. c. Complete rectal prolapse: The intussusception emerges through the anal canal and protruding below the external anal verge.

4) Rectocele (Fig. 3): The anterior rectal wall herniates forward into vagina and contrast medium is displaced anteriorly. According to the depth of rectocele, we divided into three grades: Grade I: 6-15 mm (45.61%), Grade II: 16-30 mm (49.37%) and Grade III: greater than 31 mm (5.02%). Surgical results were good in grade II-III, but poor in grade I, especially in patients with rectocele deeper than 10 mm. We suggested that such a gradation is useful for clinical application.

5) Spastic pelvic floor syndrome (SPFS) and hypertrophy of the puborectalis muscle: SPFS is...
a functional disorder of normal pelvic floor muscle. It can only be detected by defecography during straining. The anorectal angle is not increased while straining, but remains at 90 degrees. It causes difficult and painful defecation occasionally inability to defecate for several days. The cause of this dysfunction is unknown. Kuijpers considered it is possible that psychological factor play a part, as is the cause with other functional disorders.

By means of analysis of SPFS plus rectocele of 59 patients, a new roentgenologic finding-Goose sign (Fig. 5) is described. Its incidence is almost 100%, so it is important for diagnosis of this disease.

In 1964, Wasserman described four cases of ano-rectal dysfunction associated with spastic hypertrophy of the puborectalis sling. Segmental excision of the puborectalis sling was performed in three patients resulting in restoration of regular defecation. Recently, we treated two cases of hypertrophy of puborectalis by segmental excision of the puborectalis with good result (Fig. 6).

6) Enterocolic: A deep rectogenital fossa is seen on lateral films. It is diagnosed as an increased distance between the vagina and the rectum. The space may or may not contain small bowel loops, i.e. forming an enterocoele.

Most abnormal sign were usually 2–4 types grouping together. The incidence of abnormal signs combination were: DPS: 80.92%, RC: 54.88%, AMP and/or IRS: 42.09%, and SPFS: 25.12%. Splanchnoptosis and enterocoele may be secondary changes, the incidence were 9.07% and 13.2%.

4. Discussion

1) A normal defecogram consists of five fundamental conditions—the first two are due to relaxation of the puborectal muscle. (a) Increase of the anorectal angle: In our series of 70 normal persons, the anorectal angle was measured with a mean values of 96.53±12.22 degrees (60-123) at rest and 116.32±14.93 degrees (94-151) during straining. (b) Loss of the puborectalis impression on the posterior wall of the distal rectum. (c) Rectal emptying. (d) Wide aperture of the anal canal. (e) Good resistance of the pelvic floor, the mean normal descent is no more than 3 cm.

2) Rectocele: Even in recent textbook on coloproctology, rectocele is not mentioned as a cause of defecation disorders. Many surgeons do not realize that rectocele occurs so frequently. Rectocele can be demonstrated quite clearly on defecography or by digital examination during straining, but during rest condition rectocele can not palpated. The rectocele may be associated with other symptoms such as rectal fullness, incomplete evacuation, pain, bleeding and protrusion. We use transrectal repair of the rectocele and have good results (Table 1). The operation result is better in the large one, for symptomatic rectocele always presents respectively.

Table 1 Result of transrectal repair of rectocele as reported in the literature

<table>
<thead>
<tr>
<th>Author</th>
<th>No.</th>
<th>Follow-up (yrs)</th>
<th>Success rate (%)</th>
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<tbody>
<tr>
<td>Sullivan et al</td>
<td>151</td>
<td>1.5</td>
<td>79.5</td>
</tr>
<tr>
<td>Capps</td>
<td>51</td>
<td>?</td>
<td>94.0</td>
</tr>
<tr>
<td>Sehapyak</td>
<td>355</td>
<td>?</td>
<td>84.5</td>
</tr>
<tr>
<td>Yu De-hong</td>
<td>69</td>
<td>1.0</td>
<td>76.8</td>
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a large size.

2) Internal rectal intussusception (IRI): IRI is rather common but is rarely recognized clinically, for the IRI can not be revealed by diagnostic modalities other than defecography. The main symptoms are difficulties in emptying of the bowel and sensation of obstruction. Rectal bleeding is also common, often due to traumatic proctitis or solitary ulcer.

Stevenson and Shorvon\(^4\) divided the intussusception of rectum into seven grades. Grade 1 and 2 involve folds of mucosa of 3 mm or less in thickness. For grade 3 and above, the folds are thicker than 3 mm. In grade 5, the circumferential fold impinges on the internal orifice, in grade 6, extends into the anal canal and in grade 7, prolapses externally. They reported that 20 percent (9/46) of normal individuals have a grade 5 or 6 intussusception. Though, if the symptom is not severe, conservative treatment is the first choice.

The standard operation of rectal intussusception are rectopexy. We use mucosal suture and sclerotherapy for recto-rectal intussusception and abdominal sling for external rectal intussusception with good results.

4) Results of surgical management or outlet constipation: Eighty-six patients with outlet constipation were treated by operation. Surgical procedures included repairment of the rectocele, mucosal suture and sclerotherapy or internal rectal intussusception. All of the patients were followed for three months to 2 years, improvement was noted in 76.7% (Table 2).

<table>
<thead>
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<th>Table 2 Postoperative follow-up of 86 cases</th>
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<tbody>
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<td>Excellent</td>
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<tr>
<td>IRI</td>
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<tr>
<td>RC+IRI</td>
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<tr>
<td>Total</td>
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References