Defecography in Patients with Anorectal Disorders : A Study in 27 Cases

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Abstract

Defecography of twenty-seven cases of anorectal disorders with an age range from 22 to 86 years, were evaluated from June 1989 to February 1999. There were 24 patients with constipation, 2 patients with incomplete defecation and mucous bloody stool in one case. The defecographic results were analyzed regarding the following 1) anorectal angle, defined both at rest and straining 2) abnormalities of the rectal configuration during straining, including rectocele, intussusception, infolding and ulceration. 3) pelvic floor descent. The results showed abnormal anorectal angle 5 cases, rectocele 15 cases, intussusception of the rectal wall 3 cases, infolding 11 cases, ulceration 7 cases and anal canal constriction 1 case.

Consequently, the patients with anorectal disorders were found to have a variety of rectal abnormalities in which the defecography would be the imaging tool in demonstrating them.

Key word : Defecography, Anorectal Disorders

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Defecography is a minimally invasive investigation that provides information about anal sphincter, puborectalis and levator muscles, and rectal function as well as rectal pathological anatomy(1). It was first described by Burhenne in 1964 (2) and then the technique was modified by many investigators. It has become more popular since 1984, when Mahieu et al described an easy, non-

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invasive barium examination of rectal evaluation (3). Many recent papers in the literature described defecographic findings that were assumed to be normal and abnormal. The purpose of this study was to analyze the defecographic results of Thai people who have anorectal disorders.

PATIENTS

The defecography of twenty-seven cases of anorectal disorders from June 1989 to February 1999 were retrospectively reviewed. There were 13 men and 14 women, ranging in age from 22 to 86 years, with a mean age of 50.1 years. Clinical presentations were constipation in 24 cases, incomplete defecation in 2 cases and mucous bloody stool in 1 case.

METHOD

Defecography examination was performed according to the technique described by Mahieu et al(3). About 80-200 ml of thick barium was introduced into the rectum until the patient had a sensation of rectal fullness, then the patient would sit on a specially designed, non-radio-opaque seat in lateral projection. Spot films were taken under fluoroscopy at resting state, during straining and post defecation.

The defecographic results were analyzed in 3 aspects:

1. Anorectal angle : Anorectal angle was the angle between the axis of the anus and the line which bisected the tangents drawn along the anterior and posterior walls of the distal rectum. It was defined both at rest and straining.

2. Abnormalities of the rectal configuration during straining including rectocele, intussusception, infolding, ulceration and anal canal constriction. Rectocele referred to the anterior bulge outside the line of anterior rectal wall that occurred during straining or defecation. Infolding was a small fold, mainly on the posterior wall of the lower rectum. Intussusception was defined as the invagination of the proximal rectal wall into the distal rectum, formed during defecation and persisting after the bolus had passed. Anal canal constriction was the contraction of the puborectalis muscle during defecation or straining.

3. Pelvic floor descent : Pelvic floor descent was evaluated during straining. The criteria of pelvic floor descent were comparatively evaluated by 2 methods. Method 1 was described by Shorvon PJ et al, using 3 cm below the pubococcygeal line (1). Method 2 was described by Frederick M. Kelvin et al, using 4 cm below the inferior margin of the ischial tuberosity(4).

The criteria for normal defecography included :

1. Increased resting anorectal angle between 74°-121° to 90°-156° on straining(5).

2. Loss of impression of the puborectalis sling on posterior wall of the rectum during straining.

3. Wide opening of the anal canal on evacuation.

4. Descent of the anorectal junction less than 4 cm below the inferior margin of the ischial tuberosity during straining(4).

RESULTS

1. Anorectal angle : There were 29 defecographic results in 27 patients in which one patient had two follow-up studies. The resting anorectal angle was measured between 85° and 155° with a mean of 111.7°. During straining, the mean anorectal angle increased to 131.3°, ranging from 95°-165°. One patient had insufficient increased anorectal angle or anal canal constriction. There were 5 patients with increased anorectal angle at rest, ranging from 125°-155°, all had constipation ranging from 2 to 7 years. (Fig. 1)

2. Abnormalities of the rectal configuration : Abnormalities of the rectal configuration included rectocele 15 cases (Fig. 2), intussusception 3 cases (Fig. 3), infolding 11 cases (Fig. 4) and ulceration 7 cases. (Fig. 5)

3. Pelvic floor descent : The position of the pelvic floor during straining is shown in Table 1.

By using method 1, all patients were defined as having pelvic floor descent. By using metod 2, 17 patients had pelvic floor descent. All patients with rectocele showed pelvic floor descent.

DISCUSSION

The anorectal angle is formed by the puborectalis sling and is best measured where the sling makes the impression on the posterior edge at the anorectal junction(6). In normal people, when strained down, the anorectal angle is increased due

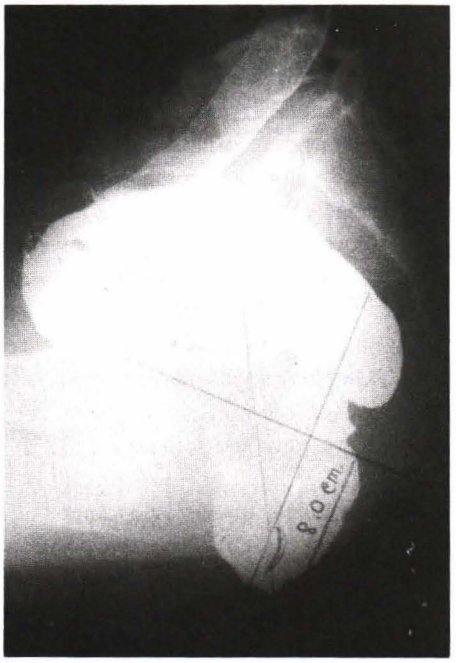

Fig. 1. Defecography shows abnormal anorectal angle at rest (150°) and descent pelvic floor about 8 cm from pubococcygeal line.

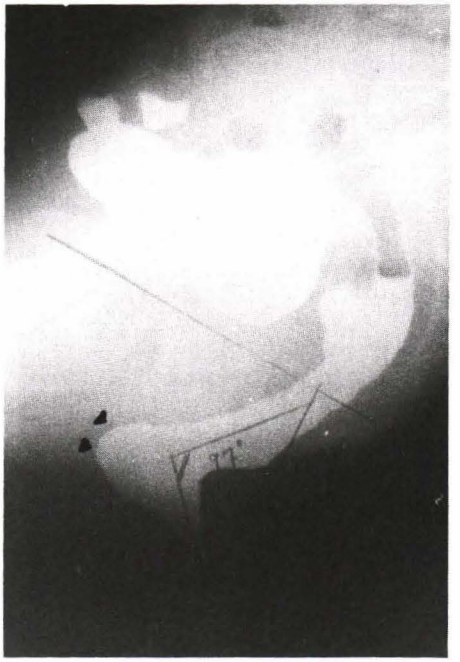

Fig. 2. Defecography shows rectocele during evacuation (arrow-heads).

Fig. 3. Intussusception (arrow-heads) and rectocele (arrow) are demonstrated on defecography.

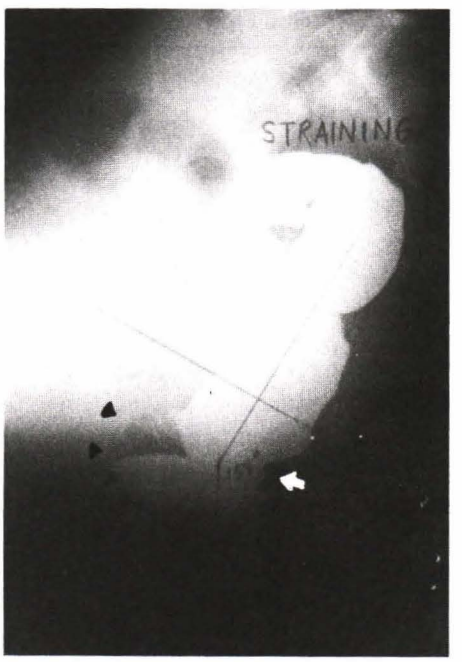

Fig. 4. Defecography shows rectocele (arrow-heads) and infolding (arrow).

Fig. 5. Defecography shows ulcers at anterior and posterior walls of the rectum (arrow-heads) with rectocele (arrow).

Table 1. Position of the pelvic floor.

Method	N	Position of pelvic floor (cm)
1	29	8.8 ± 2.2
2	29	3.9 ± 2.0

Note : Measurement was provided as mean ± standard deviation.

to the relaxation of the puborectalis sling. An inability to relax the puborectalis sling and pelvic muscles was recognized by Wasserman IF as a cause of obstructed defecation in 1964[7]. One case in our study showed insufficient increase in anorectal angle during straining, causing defecation difficulty. This consequence was called anal canal constriction. This patient improved after sphincterotomy. Maheiu et al as well as many authors found that incontinent patients had a larger anorectal angle at rest than patients with constipation [3]. However, two reports[6,8] showed that anorectal angle lacked clinical relevance, increased anorectal angle could be found in patients with constipation or incontinence. In our study, there were 5 patients with increased anorectal angle at rest, all of them had constipation ranging from 2 to 7 years.

The abnormalities of rectal configuration in our study included rectocele, intussusception, infolding and ulceration. These anatomical abnormalities were the cause of anorectal disorders. In 15 cases of rectocele, 5 cases underwent repair of rectocele and 1 case had rectopexy. There were 3 cases of intussusception, 1 case was treated with rectopexy. Among 11 cases of infolding, two cases were treated with rectopexy, two cases had rectocele repaired. Of remaining patients with abnormal defecographic results, some refused operation, some were treated conservatively and some were lost to follow-up.

All patients in our study met the criteria of descent pelvic floor if using the position of the pelvic floor on straining at the point more than 3 cm below the pubococcygeal line[1] (method 1). By using the position of the anorectal junction more than 4 cm below the inferior margin of the ischial tuberosity[4] (method 2), 17 patients had pelvic floor descent. Therefore, the second method was less sensitive and probably more specific for evaluating descent pelvic floor. We also found that all patients with rectocele showed pelvic floor descent. Therefore, rectocele and pelvic floor descent could occur in the same event. Many papers reported these coexisting findings in patients with constipation. For example, Reginald Goei et al concluded [9,10] that perineal descent occurred due to a long period of excessive straining.

Rectal ulcers were found in 7 patients. Six patients presented with constipation. One patient was a healthy man and had a history of mucous bloody stool for about 1 month. He was found to have a rectal ulcer by sigmoidoscopy. Apart from proctitis, the cause of rectal ulcer could be due to prolonged constipation. Several series have reported rectal ulcer syndrome[11-13]. For example, Rutter and Riddell stated that the majority of patients with solitary rectal ulcer syndrome strained at stool and that there was a clear connection between excessive straining and ulceration of the rectal mucosa[11].

SUMMARY

The main applications of defecography are evaluation of anatomical rectal abnormalities as a possible cause of anorectal disorders. The useful findings of the defecographic results are rectocele,

intussusception infolding, ulcer and descent pelvic floor. The measurement of anorectal angle can give details of pathophysiology of defecation but without clinical relevance. Therefore, defecography plays an important role in diagnosis for proper treatment in patients with anorectal disorders.

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REFERENCES

1. Shorvon PJ, McHuge S, Diamont NE, Somers S, Stevenson GW. Defecography in normal volunteers: Results and Implications. Gut 1989; 30: 1737-49.
2. Burhenne HJ. Intestinal evacuation study: A new Roentgenologic technique. Radiol Clin 1964; 33: 79-84.
3. Mahieu P, Pringot J, Bodart P. Defecography: I description of a new procedure and results in normal patients. Gastrointest Radiol 1984; 9: 247-51.
4. Kelvin FM, Marlinte DDT, Hornback JA, Benson T. Pelvic prolapse : Assessment with evacuation proctography (Defecography). Radiology 1992; 184: 547-51.
5. Freimanis MG, Wald A, Caruana B, Bauman DH. Evacuation Proctography in normal volunteers. Invest Radiol 1991; 26: 581-5.
6. Felt-Bersma RJF, Luth WJ, Janssen JJ, Meuwissen SG. Defecography in Patients with Anorectal Disorders: Which Findings are Clinically Relevant? Colon and Rectum 1990; 33: 277-84.
7. Wasserman IF. Puborectalis Syndrome (Rectal Stenosis due to Anorectal Spasm). Colon and Rectum 1964; 7: 87-98.
8. Bartolo DC, Roc AM, Virgee J, Mortenson NJ. Evacuation proctography in obstructed defecation and rectal intussusception. Brit J Surg 1985; 72 (Suppl): S111-6.
9. Goei R. Anorectal function in patients with defecation disorders and asymptomatic subjects: Evaluation with defecography. Radiology 1990; 174: 121-3.
10. Goei R, Baeten C. Rectal intussusception and rectal prolapsed: Detection and post-operative evaluation with defecography. Radiology 1990; 174: 124-6.
11. Rutter KR, Riddell RH. The solitary ulcer of the rectum. Gut 1969; 10: 871-81.
12. Goei R, Baeten C, Arends JW. Solitary rectal ulcer syndrome. Findings at barium enema study and defecography. Radiology 1988; 168: 303-6.
13. Madigan MR, Morson BC. Solitary ulcer of the rectum. Gut 1969; 10: 871-81.

การตรวจดีฟีโคกราฟีในผู้ป่วยที่มีความผิดปกติเกี่ยวกับการขับถ่ายอุจจาระ: การศึกษาในผู้ป่วย 27 ราย

ดรุนี บุญยืนเวทวัฒน์, พ.บ.,*
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ผลการตรวจ Defecography ระหว่างเดือนมิถุนายน 1989 ถึง กุมภาพันธ์ 1999 ในผู้ป่วยที่มีความผิดปกติเกี่ยวกับการขับถ่ายอุจจาระจำนวน 27 ราย ซึ่งมีอายุอยู่ในช่วง 22-87 ปี ประกอบด้วยผู้ป่วยที่มีอาการท้องผูก 24 ราย อุจจาระไม่สุด 2 ราย และถ่ายเป็นมูกเลือด 1 ราย รายละเอียดของการศึกษา Defecography คือ 1) วัด Anorectal angle ในระยะพักและขณะกำลังเบ่ง 2) ความผิดปกติของรูปร่างของ rectum ซึ่งประกอบด้วย rectocele, intussusception, infolding และ ulceration 3) pelvic floor descent ผลการศึกษาคือพบความผิดปกติของ anorectal angle 5 ราย, rectocele 15 ราย, intussusception 3 ราย, infolding 11 ราย, ulceration 7 ราย และ anal canal constriction 1 ราย ดังนั้นผู้ป่วยที่มีความผิดปกติเกี่ยวกับการขับถ่ายอุจจาระ สามารถตรวจหาความผิดปกติโดยวิธีการตรวจดีฟีโคกราฟี

คำสำคัญ : ดีฟีโคกราฟี, ความผิดปกติเกี่ยวกับการถ่ายอุจจาระ

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