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ORIGINAL RESEARCH ARTICLE

# Rectal intussusception and external rectal prolapse are common at proctography in patients with mucus discharge

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**Abstract:**

Objectives: Although various pelvic floor abnormalities are recognized to cause mucus discharge (MD), little is known about the exact distribution and frequency of diseases causing MD in evacuatory disorders. This study aimed to identify the most common diseases at evacuation proctography in patients with MD. Methods: Patients seen with symptoms of evacuatory disorder underwent proctography. Data for patients with MD who were not associated with fecal incontinence (FI) were prospectively entered into a database and analyzed retrospectively. The degree of MD was documented using FI Severity Index. Results: Sixty-two patients were included for analysis. Forty-nine (79%) had rectal intussusception (RI) or external rectal prolapse (ERP). Of those with RI, MD was observed more in patients with recto-anal intussusception (n = 22) than those with recto-rectal intussusception (n = 8). Of the 39 patients who were not associated with hemorrhoids or mucosal prolapse, 31 (79%) had RI or ERP. Meanwhile, of 582 patients who underwent proctography, 301 had RI and 96 had ERP. MD without FI was present in 13% (40/301) patients with RI and 9% (9/96) with ERP. Surgery was performed in 21 patients, and MD was cured in 20 (95%) postoperatively. Conclusions: RI and ERP were common at proctography in patients with MD.

**Keywords:**

mucus discharge, evacuatory disorder, rectal intussusception, external rectal prolapse

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## Introduction

Various pelvic floor abnormalities are recognized to cause mucus discharge (MD), including hemorrhoids, mucosal prolapse, rectal intussusception (RI), anorectal neoplasms, inflammatory bowel disease, and weak anal sphincter[1]. MD or incontinence of mucus can be differentiated from fecal incontinence (FI). In fact, according to the FI Severity Index[2], an extent of incontinence to gas, mucus, liquid stool, and solid stool should be assessed, individually. While the etiology or the treatment of FI has been described extensively, little has been published on either the incidence of MD alone in patients with pelvic floor abnormalities or the distribution of diseases causing MD in evacuatory disorder.

The present study aimed to identify the most common diseases at evacuation proctography in patients with MD who were not associated with FI.

## Methods

We included all patients attending a proctology clinic between February 2010 and April 2017, with symptoms of rectal evacuatory disorder, who underwent evacuation proctography as a part of the investigation protocol. Data for the patients with MD were prospectively entered into a pelvic floor database. MD was defined as the incontinence of rather clear and sticky liquid like saliva. Soiling was defined as staining the underwear with brown feces and can be differentiated from MD. The degree of MD was documented according to the FI Severity Index. Symptoms of obstructed

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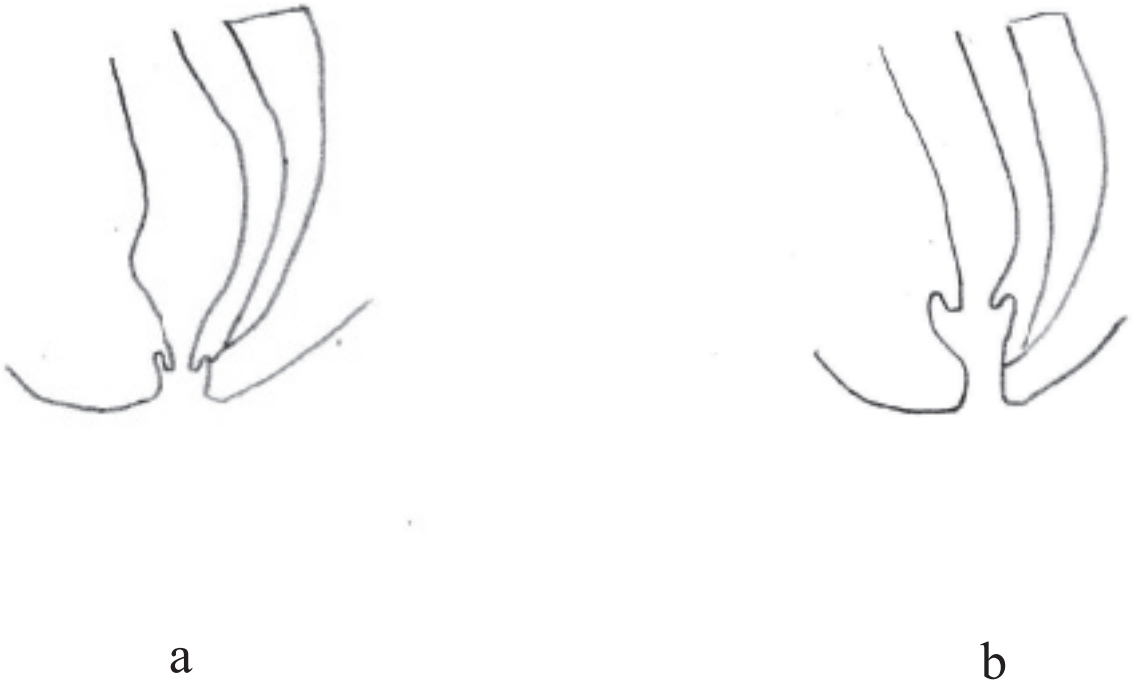


**Figure 1.** The apex of the intussusception impinges on the internal anal orifice or intra-anal in the recto-anal intussusception (a), whereas it remains intrarectal in the recto-rectal intussusception (b).

defecation (OD) include incomplete evacuation, straining, digitation, sensation of anorectal obstruction, and repetitive visits to the toilet. A cut-off of 5 or more for the Wexner Constipation Score was used to define the presence of OD[3].

Although MD was commonly associated with FI, we excluded such patients from the study to keep the study cohort as unbiased as possible.

Proctography technique was standardized. The small bowel was opacified with a mixture containing 100 mL Barister™ (Barium sulfate 100% w/w; Fushimi Health Care Ltd., Kagawa, Japan) and 10 mL Urografin (60% w/w; Bayer Pharmaceutical Ltd. Japan), ingested 30 min prior to the procedure. The patient was placed in the left lateral position on the fluoroscopic table; barium installation (50 mL) and air insufflation were performed to improve the quality of the contrast image. Synthetic stool consisting of barium sulfate, porridge oats, and water was inserted into the rectum using a 50 mL bladder syringe. A total of 150 mL was introduced. The patient was then seated on a radiolucent commode on a fluoroscopic X-ray table. Lateral X-rays of the pelvis in resting, squeezing, and pushing positions were taken. The patient was then asked to bear down maximally during evacuation. Images from proctography were analyzed by one of the authors (T.T.), who is experienced in the evaluation[4] and was blinded at that time to the symptomatology of the individual patients. Measurements were taken using the X-ray flat panel detector (Toshiba Ultimax, Toshiba Medical Systems, Japan) calibrated to a metal globe or a paper clip of known dimensions screened within the image field during proctography.

All measurements were taken from the maximal straining image during defecation. RI can be classified into recto-rectal intussusception (RRI) and recto-anal intussusception (RAI) (Figure 1). RAI was diagnosed when the apex of the rectal intussusception impinged on the internal anal orifice or was intra-anal, based on the images taken during maximal straining defecation. RRI was differentiated from RAI if the apex remained intrarectal and did not impinge on the internal anal orifice[5]. RI was graded according to the Oxford Rectal Prolapse Grade (ORPG)[3] (Table 1). In addition, pelvic floor descent during defecation was estimated by the extent to which the anorectal junction descended in relation to the inferior margin of the ischial tuberosity. The defined in-hospital normal range was less than 3 cm. Rectocele was classified as Grade 1 (<2 cm in depth), Grade 2 (2-4 cm in depth), or Grade 3 (>4 cm in depth)[6]. The size was calculated in a standard fashion in the anterior-posterior dimension by measuring the distance between the most ventral part of the anterior rectal wall and an extrapolated line of the expected portion of the rectal wall[7]. Enterocele was diagnosed when the extension of the loop of small bowel was located between the vagina and rectum[8].

A transanal ultrasound examination or anorectal manometry was not performed routinely. The former was performed using a 10 MHz radial transducer (Flex Focus 800 Ultrasound Machine BK Ultrasound) to evaluate the existence of the defect of anal sphincter muscle. Anorectal manometry was performed with the patient in the lateral position, and

**Table 1.** Oxford Rectal Prolapse Grading System.

| Radiological characteristics of prolapse | | |
|---|---|---|
| Recto-rectal intussusception | Grade I | Descends to proximal limit of rectocele |
| | Grade II | Descends into level of rectocele, but not onto anal canal |
| Recto-anal intussusception | Grade III | Descends onto anal canal |
| | Grade IV | Descends into anal canal |
| External rectal prolapse | Grade V | Descends through anal canal, protrudes from anus |

**Table 2.** Severity of Mucus Discharge on FISI, Compared with Evacuation Proctography Findings and Manometric Data.

| | 1-3 times per month | Once per week | Twice per week | Once per day | More than twice per day | *p** |
|---|---|---|---|---|---|---|
| Total (*n*=62) | 10 | 10 | 10 | 4 | 28 | |
| Pelvic floor descent# | | | | | | |
| <3 cm (n=50) | 8 | 9 | 6 | 2 | 25 | 0.13 |
| ≥3 cm (n=12) | 2 | 1 | 4 | 2 | 3 | |
| Rectal intussusception | | | | | | |
| RRI (n=8) | 2 | 1 | 2 | 1 | 2 | 0.77 |
| RAI (n=32) | 6 | 7 | 4 | 2 | 13 | |
| Manometric study | | | | | | |
| normal (n=20) (MRP ≥55 and MSP ≥150 $cmH_2O$) | 3 | 1 | 4 | 2 | 10 | 0.30 |
| subnormal (n=8) (MRP<55 and/or MSP<150 $cmH_2O$) | 2 | 2 | 0 | 0 | 4 | |

FISI: fecal incontinence severity index; RRI: recto-rectal intussusception; RAI: recto-anal intussusception; MRP: maximum resting pressure; MSP: maximum squeeze pressure; # extent of anorectal junction relative to the inferior margin of the ischial tuberosity during defecation. *chi-square test

no bowel preparation was used. Anal pressure was measured with a catheter-tip pressure transducer. This study was approved by the regional Ethics Committee. Information of the study protocol was made public, and opportunities to withdraw the consent was ensured for the patients, but no patient refused to participate the study subsequently.

## Statistical analysis

Statistical analysis was performed using Statistical Package for the Social Sciences (SPSS) version 11.0 (SPSS Inc., Chicago, IL, USA). The continuous variables were expressed as median (range). The chi-square test was used for categorical variables. A *P*-value of <0.05 was taken as significant for all tests.

## Results

### *Demographic and clinical findings*

Five hundred and eighty-two patients underwent evacuation proctography. Of these, 330 had anal incontinence, 207 had MD with or without FI, and 62 (11%) had MD only. There were 33 men (53%) and 29 women. The median age was 69 (26-90) years. Thirty-six patients (58%) had OD with a median CSS score of 12 (6-17). Thirty-two (52%) patients reported the presence of blood on the stools and 29 (47%) had perineal pain. The severity of MD is shown in Table 2. Twenty-eight patients (45%) had MD more than twice per day.

### *Evacuation proctography*

Forty-nine patients (79%) had RI or external rectal prolapse (ERP). Ten were associated with rectocele, and 12 had hemorrhoids. Thirty of the 49 patients (61%) had OD. The distribution of pelvic floor abnormalities based on the ORPG is shown in Table 3. MD was observed more in patients with RAI (n = 32) than those with RRI (n = 8). Three had rectocele only, 2 had pelvic floor dyssynergia with hemorrhoids, and 1 had mucosal prolapse only. Seven had normal proctogram. Of those, three had previous anal surgery, two had prolapsed hemorrhoids and two had weak sphincter

**Table 3.** Distribution of Pelvic Floor Abnormalities on Evacuation Proctography.

| Prolapse | | | Gd of rectocele | | | | | | Gd of hemorrhoids | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | EC | MP | PFD | 2 | 3 | 4 |
| ORPG | Gd I | 1 (1) | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| | Gd II | 7 (5) | 1 | 2 | 0 | 0 | 0 | 1 | 1 | 3 | 0 |
| | Gd III | 24 (17) | 3 | 2 | 0 | 0 | 2 | 0 | 3 | 5 | 4 |
| | Gd IV | 8 (3) | 1 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| | Gd V | 9 (4) | 0 | 0 | 0 | 2 | 0 | 0 | 0 | 0 | 0 |
| Total | | 49 (30) | 6 | 4 | 0 | 4 | 2 | 1 | 4 | 8 | 4 |

ORPG: Oxford rectal prolapse grade; Gd: grade; SC: sigmoidocele; MP: mucosal prolapse; EC: enterocele; PFD: pelvic floor dyssynergia; parentheses: number of patients with obstructed defecation

**Table 4.** Distribution of Pelvic Floor Abnormalities on Evacuation Proctography.

| Prolapse | | | Gd of rectocele | | | EC | PFD |
|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | | |
| ORPG | Gd I | 1 (1) | 1 | 0 | 0 | 0 | 0 |
| | Gd II | 3 (2) | 0 | 1 | 0 | 0 | 1 |
| | Gd III | 10 (6) | 1 | 1 | 0 | 0 | 0 |
| | Gd IV | 8 (3) | 1 | 0 | 0 | 2 | 0 |
| | Gd V | 9 (4) | 0 | 0 | 0 | 2 | 0 |
| Total | | 31 (16) | 3 | 2 | 0 | 4 | 1 |

ORPG: Oxford rectal prolapse grade; Gd: grade; SC: sigmoidocele; EC: enterocele; PFD: pelvic floor dyssynergia; parentheses: number of patients with obstructed defecation

muscle on digital examination, who were associated with subnormal resting pressure.

The median pelvic floor descent was 17 (-31-51) mm, and 19% (12/62) of the patients had more than 3 cm in the descent (subnormal descent). The degree of MD was not significantly different between the patients with normal pelvic floor descent and those with subnormal pelvic floor descent. Also, it was not significantly different between those with RRI and those with RAI (Table 2). There was no significant difference in the presence of OD symptoms between patients with RRI (6/8) and those with RAI (20/32) (Table 3).

Of the 39 patients who were not associated with prolapsed hemorrhoids or mucosal prolapse, 31 (79%) had RI or ERP (Table 4).

### *Incidence of MD only*

Of 582 patients who underwent evacuation proctography, 301 had RI with or without rectocele and 81 had rectocele only. MD without FI was present in 13% (40/301) and 4% (3/81), respectively. Similarly, 96 had ERP and 9% (9/96) had MD only.

### *Anorectal manometry and transanal ultrasound scan*

Twenty-eight patients (45%) underwent manometric study, partly because patients were not associated with FI. The median maximum resting pressure (MRP) and maximum squeeze pressure (MSP) was 71 (10-131) and 275 (47-545) $cmH_2O$, respectively. Twenty-one (75%) patients with MD had normal MRP and 24 (86%) had normal MSP (the defined in-hospital normal ranges were 55-110 and 150-300 $cmH_2O$, respectively). Twenty patients (71%) had both normal MRP and MSP (normal manometric study). The remaining eight patients had lower MRP or MSP (subnormal manometric study). The degree of MD was not significantly different between the patients with normal manometric study and those with subnormal manometric study (Table 2).

A transanal scan was done in 13 patients (21%), and sphincter defect was found in one patient who had previous anal fistula surgery.

### *Treatment*

All patients were advised to have high residue diet and not to strain excessively for more than 5 min on defecation. Twenty-five patients (40%) received pharmacotherapy for MD with or without OD. Of these, 14 had calcium polycarbophil with an improvement in five, eight had laxative with an improvement in five, and two had loperamide with an improvement in both. One of two patients with pelvic floor dyssynergia had biofeedback training with an improvement of MD.

Surgery was indicated in patients either not responding or refusing conservative treatment. Because MD alone did not seem to be a complaint severe enough to perform surgery, which may be associated with severe complications, some of them refused surgery, leaving 21 patients willing to undergo operative procedures. Main indication for surgery in patients with RAI and/or rectocele was the presence of OD. Seven such patients underwent surgery, including laparoscopic ventral rectopexy (LVR) (1), stapled transanal rectal resection (STARR) (3), or internal Delorme procedure (3). Only two

**Table 5.** Severity of Mucus Discharge after Surgery (n=21).

| | Never | 1-3 times per month | Once per week | Twice per week | Once per day | More than twice per day | *p** |
|---|---|---|---|---|---|---|---|
| Preoperative | 0 | 2 | 2 | 5 | 1 | 11 | <0.0001 |
| 6 months | 20 | 0 | 1 | 0 | 0 | 0 | |

*chi-square test

patients having RAI without OD underwent STARR for MD. Naturally, LVR was performed in six patients with ERP. Hemorrhoids were not treated for MD alone but prolapse, and this was the case with mucosal prolapse. Two had transanal hemorrhoid dearterialization with mucopexy for prolapsing hemorrhoids, one had hemorrhoidectomy, one had transanal excision of prolapsing mucosa, and one underwent transanal mucosal cauterization and plication of the rectal muscle for mucosal prolapse. The severity of MD after surgery is shown in Table 5. The incidence of MD 6 months postoperatively was significantly lower than that preoperatively ($P$<0.0001), and MD was cured in 20 of the 21 patients (95%) who underwent surgery

## Discussion

Distribution of diseases which cause MD only in patients with evacuatory disorder has not been known sufficiently. We found that approximately 80% of the patients who had MD without FI, had RI or ERP. Certainly, it was not rare for more than one of disorders to coexist in the same patient who has MD. Even if the patients with associated hemorrhoids and mucosal prolapse which may cause MD were excluded from the subjects, the incidence of RI or ERP in patients with MD only was unchanged (79%) in this study.

The incidence of overlapped symptoms in patients with RI has been reported by the previous studies, where FI was present in 32%-56% and MD in 22%-24% patients[3,9]. However, the incidence of MD without FI was unclear. In this study, it was 13% of those with RI, and 9% of those with ERP. Overall, it was 11% of a total of 582 patients who underwent evacuation proctography.

Pathophysiology of MD may be complex. Patients with defecatory disorder such as RI, ERP, rectocele, pelvic floor dyssynergia, and mucosal prolapse, who complained of OD, make an excessive straining effort. The mucosa of the rectal wall descends into the low rectum or the anal canal, and the anorectal mucosa either injured or stimulated mechanically may secrete mucus. In fact, a certain amount of mucus is frequently observed in the low rectum of such patients with OD by proctoscopy. Within the group of patients with RI, the number of patients with RAI was fourfold greater than that with RRI. This may be because RAI may cause MD by inappropriate activation of the recto-anal inhibitory reflex by the prolapsing of the rectal "bolus" as previously suggested by Faroux et al.[10]. In patients with hemorrhoids, mucus may discharge along with prolapsed piles. Naturally, weak sphincter is the cause of MD.

Conservative treatment is a first choice for patients with MD, except for those with ERP. Patients need to be advised to have high residue diet and to avoid excessive or prolonged straining on defecation. Pharmacotherapy was not standardized and was given individually. Many patients were prescribed calcium polycarbophil in this study, which is known to absorb liquid component in feces[11]. Laxative may be effective in patients with MD who had OD. Loperamide can be used in patients with weak sphincter[12]. No doubt, biofeedback training is a primary choice for patients with pelvic floor dyssynergia[13].

Surgery was indicated when conservative treatment failed. LVR for the treatment of ERP or RAI has been reported to improve FI and OD[14,15]. One patient with RAI who had both MD and OD in this study underwent LVR with a disappearance of MD postoperatively. STARR procedure in patients with RAI and/or rectocele who had OD has been reported to be effective[16]. MD was cured in five patients who had STARR procedure in this study. Internal Delorme procedure for the treatment of RAI and/or rectocele was effective for not only MD but also OD in this study, as was in line with the previous studies[17]. It may be natural that transanal hemorrhoid dearterialization with mucopexy or hemorrhoidectomy was effective for prolapsed hemorrhoids and MD, and transanal excision of the mucosal prolapse cured MD.

There are certain limitations to our study. First, this was a retrospective study, and patients with MD did not undergo routine colonoscopy to exclude other bowel diseases. Second, anal sphincter function was under-assessed because not all the patients with MD underwent anorectal manometry or a transanal ultrasound scan. Third, because patients with bowel neoplasms, inflammatory bowel disease, or hemorrhoids without evacuatory disorder were not included in this study, the incidence of MD in those patients were not assessed. Fourth, the interpretation of the effect of morphology of RI on MD is limited because factors such as barium compound thickness and the degree of patient straining at the time of evacuation proctography may affect morphological assessment or the grade of RI.

In conclusion, RI and ERP were common at evacuation proctography in patients with MD. Further studies are necessary to confirm the results.

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Conflicts of Interest

There are no conflicts of interest.

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