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## Symptom distribution and anorectal physiology results in male patients with rectal intussusception and prolapse

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### ABSTRACT

**Background:** Rectal intussusception and external rectal prolapse are uncommon proctographic findings in men reflecting the lack of studies investigating such patients. The aim of this study was to identify the demographic, clinical, and physiological characteristics of this population with a view to appreciate the mechanism of development of this condition. **Methods:** All men, presenting with symptoms of constipation or fecal incontinence, who were diagnosed proctographically with recto-rectal intussusception (RRI)/recto-anal intussusception (RAI) or external rectal prolapse (ERP) between 1994 and 2007 at a tertiary academic colorectal unit were studied. Demographics, relevant comorbidities, distribution and symptom duration, and anorectal physiology results were analyzed retrospectively for each proctographic group and intergroup comparisons performed.

**Results:** Two hundred five men (median age 50 y; range, 13–86) including 155 (75.6%) without any relevant comorbidities were studied. A significant proportion of patients in all proctographic groups reported rectal evacuatory difficulty ([RRI, 46.4%], [RAI, 39.4%], [ERP, 44.8%];  $P = 0.38$ , analysis of variance). Patients also reported a combination of fecal incontinence symptoms (e.g., urge, passive, postdefecatory leakage) that did not differ across the proctographic groups. Anorectal physiological parameters were within normal range and were not found to be statistically different between the proctographic groups with the exception of anal resting pressure, which was lowest in ERP patients (62 cm H<sub>2</sub>O; range, 14–155) compared with patients with RRI (89 cm H<sub>2</sub>O; range, 16–250;  $P = 0.003$ ) and RAI (92 cm H<sub>2</sub>O; range, 38–175;  $P = 0.006$ ).

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**Conclusions:** Men with rectal intussusception and prolapse present with a combination of symptoms, predominantly defective rectal evacuation. Anorectal physiological assessment has failed to shed light into the mechanism of development of this condition and thus, the need for large observational studies incorporating integrated defecographic and manometric assessments of the evacuation process.

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## 1. Introduction

Rectal intussusception (RI) is a partial or full-thickness invagination of the rectal wall that may be confined to the rectum (recto-rectal intussusception, RRI), descend into the anal canal (recto-anal intussusception, RAI) or extend beyond the anal verge (external rectal prolapse, ERP) [1]. RI is diagnosed during defecating proctography in patients presenting with evacuatory difficulties, but its clinical significance is occasionally uncertain in view of its presence in healthy asymptomatic volunteers [2–4]. The vast majority of affected patients are elderly females due to the damaging effect of pregnancy and menopause on the pelvic floor [5].

The condition is also seen, rather unexpectedly, in men but little is known about its etiology and distribution of symptoms in this subgroup of patients, with no studies in the literature discussing these factors in a male cohort [6]. Factors likely to be involved include loose sacral fixation of the rectum with an underlying connective tissue disorder, increased intra-abdominal pressure (secondary to obesity, chronic cough, and weight lifting), colonic dysmotility with chronic straining, and perineal hypermobility [5,7]. Traumatic impairment of the levator ani is a major risk factor in women but unlikely to be the predominant factor in men. More recently, it has been suggested that morphologic changes in the enteric ganglia may also contribute to the development of RI and ERP and complement existing etiological parameters [6]. Despite these theories, the natural history of the condition is not understood and it is currently debatable whether RI and ERP are part of the spectrum of a progressive disorder or two separate clinical entities.

The aim of this study was to explore the demographic, clinical, and anorectal physiological characteristics found in symptomatic men with RRI, RAI, and ERP to define this cohort and potentially understand the mechanism of development of the condition. A secondary objective was to establish whether a progressive relationship between the proctographic cohorts exists, that is, whether RRI leads to RAI which leads to ERP.

## 2. Methods

Patients referred to a gastrointestinal physiology unit within a period of 13 y (1994–2007) with fecal incontinence or rectal evacuatory disorder, underwent routine anorectal physiological evaluation including measurement of anal resting and squeeze pressures by using water-perfused anal canal pull-through manometry, assessment of sphincter morphology by endoanal ultrasound (7 or 10 MHz; B-K Medical, Berkshire, UK), measurement of pudendal nerve terminal motor latency (PNTML) by using the St Mark's electrode (Dantec Ltd, Bristol,

UK), and estimation of rectal sensory thresholds (e.g., maximum tolerable volume, MTV) to air-filled balloon distension. All patients underwent evacuation proctography and colonic transit study [8,9].

The upper limit of normal PNTML was age stratified with pudendal neuropathy diagnosed if PNTML >2.3 ms for subjects aged <40 y and >2.5 ms for subjects aged >40 y. Rectal hyposensitivity was diagnosed when the MTV was >325 mL [10]. A prolonged colonic transit was diagnosed when the subject retained  $\geq 20\%$  of 50 markers 100 h after ingestion.

All men diagnosed proctographically with RRI (Shorvon grading 3–4; grade 3 is noncircumferential infolding  $\geq 3$  mm; grade 4 is circumferential infolding >3 mm that remains intrarectal), RAI (Shorvon grading 5–6; grade 5 is a circumferential infolding that impinges on the internal anal orifice; grade 6 is circumferential infolding that descends into the anal canal), or ERP (Shorvon grading 7) were identified from a prospectively recorded database. Patients with a proctographic diagnosis of RI graded 1–2 on the Shorvon classification were excluded from the analysis given the uncertainty surrounding the clinical significance of these findings commonly seen in asymptomatic volunteers [2,3,11]. Data were reviewed retrospectively and included patient demographics (i.e., age at presentation), type and duration of symptoms, past medical and surgical (e.g., anal, pelvic surgery) history, and anorectal physiological measurements including proctographic and colonic transit findings.

### 2.1. Statistical analysis

The anorectal physiological findings (e.g., sphincter integrity and anorectal pressures, percentage of patients with rectal hyposensitivity), duration and type of symptoms, percentage of patients with a rectocele, and percentage of patients with a positive transit study were analyzed for each proctographic group and intergroup comparisons performed.

Data analyses were performed using commercially available statistical analysis software (GraphPad Prism, Version 5; GraphPad Software, Inc, La Jolla, CA). Data normality was assessed using the De Agostino-Pearson omnibus normality test. Nonparametric data were compared using the Mann-Whitney *U*(MWU) test. Fisher exact test was used to compare levels of comorbidity between groups. One-way analysis of variance (ANOVA) in median age, presence of rectocele, positivity of transit study, duration and type of symptoms, and anorectal physiological parameters between the proctographic groups (RRI, RAI, and ERP) was calculated using the Kruskal-Wallis test with Dunn multiple comparison posttest. If the studied variable was statistically different between the proctographic groups, post-ANOVA comparison was performed for the relevant groups using unpaired *t*-test or

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