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Conventional videodefecography: Pathologic findings according to gender and age

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Abstract

Objectives: To review the most common disorders depicted with conventional videodefecography, and to compare the defecographic abnormalities between symptomatic patients according to their gender and age.
Methods: Conventional videodefecography studies of 300 patients (24 men, 266 women; mean age – 57.7) performed in a 32-month period were reviewed for the following parameters: anorectal angle, movement of the pelvic floor, intussusceptions, incontinence and rectocele. The results were analyzed using the chi-square test.
Results: Normal findings were observed in 16.7% men and 7.5% women. In women, the most frequent pathological findings were rectocele (62%), descending perineum syndrome (42.8%), intussusceptions (33.8%), incontinence (10.5%), dyskinetic puborectalis syndrome (9.4%) and rectal prolapse (4.5%); in men the most frequent pathology was the dyskinetic puborectalis syndrome (37.5%). This syndrome is more likely in men than in women ($p = 0.01$; OR 5.78); descending perineum syndrome ($p = 0.027$; OR 2.8) is more likely to occur in women.

Women with perineal descent younger than 50 years frequently present an increased descent during evacuation (81.8%), while those older than 50 years already have a low pelvic floor during rest (60.3%) ($p < 0.001$; OR 6.8), with little change in evacuation.
Conclusion: Videodefecographic findings vary with age and gender.
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Keywords: Defecography; Pelvic floor disorders; Pelvic floor; Rectocele; Constipation

1. Introduction

Conventional videodefecography enables the evaluation of the anatomy of pelvic floor but also the dynamics of rectal emptying, providing important information about anorectal and pelvic floor functions [1–5]. This technique was first described by Wallden in 1953 [6] but it was not until the 1980s that Mahieu et al. developed a technique that despite modified by opacification of other pelvic anatomic landmarks has now become standard [7,8].

Since then it has remained a widely available and cost effective procedure of choice for the assessment of anorectal dysfunction [9], despite the increasing role of magnetic resonance imaging (MRI) in the study of evacuation disorders [10].

Currently the major advantage of conventional defecography lies on the fact that it provides a near physiologic evaluation of evacuation, allowing the radiologist to examine the function and anatomy while the patient is in a position similar to the one in which daily maneuvers that generated symptoms are performed [11]. This fluoroscopic method evaluates in real time the morphology of the rectum and anal canal in correlation with pelvic bony components both statically and dynamically. Specifically it provides pelvic measurements at rest and during both squeeze and push, which are used to assess evacuation dynamics. As a result, disorders such as dyskinetic puborectalis syndrome, rectocele, intussusception and perineal descent can be diagnosed [2]. The major indications to perform a videodefecographic examination are constipation, incomplete evacuation or incontinence, perineal pain and as a follow-up

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examination of patients who have undergone surgery of the pelvic region [12].

Disorders of the posterior pelvic floor are relatively common. They are frequently found in elderly patients and are often caused by morphologic and functional abnormalities due to changes in the musculoaponeurotic support of the pelvic floor.

They are particularly common and well known in women, and some are related to obstetrical sequelae. Although many reports have discussed defecatory disorders in women, little is known about gender influence in symptomatic patients investigated by defecography [13–16].

The purpose of our study was to review the most common disorders depicted with conventional videodefecography and to compare the defecographic abnormalities between symptomatic patients according gender and age.

2. Materials and methods

2.1. Patients

Over a 32-month period (January 2009 to August 2011), 300 symptomatic patients aged 15–87 years (mean: 57.7 years; 266 females, 24 males) were addressed for conventional defecography and evaluated consecutively in our institution. Patients were referred on the basis of clinical evidence of evacuation disorders.

Ten patients were excluded of our retrospective image analysis because of lack of evacuation.

2.2. Defecography

We applied a standardized protocol to perform and evaluate all defecography examinations.

Two to three-hundred milliliters of barium paste were injected in the rectum by means of a plastic syringe connected to a catheter with the patient lying in the left lateral position. The barium paste was obtained by mixing equal proportions of potato starch and barium solution with water and should had the consistency of normal stool. We did not use suppositories and the rectum was not emptied beforehand. The patient sat on a commode (a special commode with three water-filled annular pillows), which rested on the footrest of a standard digital fluoroscopic table, in the upright position. We did not usually opacified the bladder or routinely used radio-opaque vaginal tampons. Contrast opacification of bladder, vagina, or peritoneum could be useful but are increasingly invasive.

Static images using a fluoroscopic image capture were obtained during the following maneuvers: at rest, at voluntary and maximal contraction of the sphincter and pelvic floor (“squeeze”) and at straining without defecation (“strain”).

Finally a cine-loop of the evacuation was obtained until the rectum was emptied or at least three 30 s attempts had been made to empty the rectum.

All patients were instructed to empty the rectum completely and without interruption.

All images were analyzed in consensus by two radiologists enrolled in the study.

2.3. Image interpretation

The defecographic measurements were taken at rest and during both squeeze and pushing. There is a wide range of normal values for each parameter [2,8]. The exact value of any of these isolated parameters is of little consequence if used to compare patients but is of great value if used to provide a basis for relative comparison among rest, squeeze and push values in a single patient.

The anorectal angle (ARA) was measured between the longitudinal axis of the anal canal and the posterior rectal line, parallel to the longitudinal axis of the rectum [7,17,18]. In resting conditions, its average value is 92°–114° (physiological range, 70°–140°); during muscle contraction, the angle becomes more acute, while during relaxing phase it becomes obtuse [2]. ARA is an indirect indicator of the puborectal muscle activity. Dyskinetic puborectalis syndrome was diagnosed when clear impressions in the puborectalis muscle were shown during defecation, the ARA was not changed in comparison with the angle at rest or rather became smaller, and when defecation was attempted, perineal descent hardly occurred, and the opening of the anal canal and the excretion of more than 80% feces were delayed for more than 30 s.

Perineal descent was quantitatively defined by measuring the vertical distance between the pubococcygeal line (PCL) and the anorectal junction (ARJ).

The PCL was drawn from inferior pubis to the tip of the coccyx and is considered to represent the approximate line of attachment of the pelvic floor muscles. The distance from the PCL to the ARJ was measured on images obtained when the patient was at rest and at maximal pelvic strain, to assess the position of the pelvic floor. The craniocaudal migration of ARJ indirectly represents the elevation and descent of pelvic floor. For the diagnosis of perineal descent at rest (fixed descent), the distance in centimeters between the ARJ and the PCL was measured, and perineal descent at rest was considered when the ARJ and PCL distance was superior to 6 cm. For perineal descent at straining (dynamic descent), the difference in centimeters between the ARJ position at straining and at rest was noted. Perineal descent at straining was defined as a difference of $\geq$3.5 cm between the two positions (Fig. 1).

Anterior rectocele was defined as an outpouching of the anterior rectal wall that persisted on incomplete evacuation. Outpouchings inferior to 2 cm are frequently found in asymptomatic patients and are clinically insignificant. We considered three grades of rectocele: grade I are outpouchings <2 cm in anteroposterior diameter (not clinically significant); grade II are outpouchings between 2 and 4 cm; and grade III are outpouchings with an anteroposterior diameter $\geq$4 cm.

Intussusception was defined as an invagination of the rectal wall, either intrarectal or intra-anal. More precisely rectal intussusceptions were defined as the rectum showing a funnel-shaped depression within the anal canal during push, while an invagination of the whole circumference of the rectal wall was defined as external rectal prolapse.

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