Middle East Journal of Digestive Diseases

Original Article

Defecography: How to Do That for Having Fixed Parameters?

A Izadpanah[1*], SV Hosseini[1,2], MR Rasekhi[3], MH Bagheri[3]

[1]*Department of General Surgery,* [2]*Gastroenterohepatology Research Center,* [3]*Department of Radiology, Shiraz University of Medical Sciences, Shiraz Iran*

Abstract

Background: In most of defecography films, the symphysis pubis is obscured, especially in obese patients, and the parameters will change in values if x-ray is interpreted by different reviewers or if the patient changes his/her position between the phases. This study was carried out to determine how to do the defecography to obtain fixed parameters.

Methods: Eighty patients that had been candidates for defecography were randomly divided into two equal groups. In group A defecography was performed according to the conventional protocol. In group B, a piece of a radio opaque metal was stacked on the most anterior site of the symphysis pubis of the patients and the same protocol was followed. The x-rays were reviewed by two radiologists and one colorectal surgeon. They were asked to identify the most anterior site of the pubic bone. Then the parameters were measured accordingly.

Results: In group B, the most anterior site of the pubic bone could be distinguished in all x-rays with certainty. In group A, only in12.5% of the x-rays, the 3 reviewers marked the most anterior site of the pubic bone in the same place. At least in 17.5% of the x-rays, one of the radiologists was not able to find the anterior site of the pubic bone. In 20%, at least one of the reviewers was in doubt to mark the most anterior site of the pubic bone, precisely. If there is no metal marker on pubic bone, the difference of measurement of parameters may be seen in up to 95% of the cases.

Conclusion: By placing a metallic element on the most anterior site of the symphysis pubis, the parameters in defecography will be accurately evaluated and measured.

Keywords: Defecography; Anorectal; Perineal descent; X-ray

Introduction

Defecography is a useful procedure to investigate defecation and its disorders in a physiological manner. Until now, it is performed by instillation of 50 ml of liquid barium into the rectum, followed by injection of about 100 to 200 ml of barium paste into the rectum again.[1] The anorectum is visualized laterally by fluoroscopic technique while the patient is in sitting position on toilet commode and x-rays are taken in resting, squeezing, and strain phases, and in post evacuation status.[1] A video cassette recorder also records the procedure. Interpretation of this simple and accurate study is on these lateral films.

***Correspondence:** Ahmad Izadpanah, MD, Professor of Colorectal Surgery, Department of General Surgery, Shiraz University of Medical Sciences, Faghihi Hospital, P.O. Box: 71345-1853, Shiraz, Iran. Tel: +98-711-2295563, Fax: +98-711-2330724, e-mail: izadpana@sums.ac.ir
Received: January 15, 2008 Accepted: August 5, 2008

Parameters that should be evaluated are anorectal angle, puborectalis length and perineal descent and the changes between resting, squeezing and pushing phases.[1-4] The most anterior part of the symphysis pubis is an important landmark for determination of these parameters.[1-4] However, in most of the defecography films, the symphysis pubis is obscured (Figure 1), especially in obese patients, and the parameters will change in values if x-ray is interpreted by different reviewers (Figure 2) or if the patient changes his/her position between the phases. The aim of this study was to investigate a method on how to overcome this defecography weak points.

Materials and Methods

Eighty patients that had been candidates for defecography were randomly divided into two equal groups. Group A: In 40 patients defecography was performed according to the previous protocol described above.[1-4] Group B: In the other 40 patients, a piece of a radio opaque metal was stacked on the most anterior site of the symphysis pubis of the patients and the same protocol was followed (Figure 3).

Randomization was according to the sequential numbers of patients referred for defecography. Patients with odd numbers were included in group A and those with even numbers were considered in group B.

The films were collected and reviewed by two radiologists and one colorectal surgeon, all blind to the study. They were asked to identify the most anterior site of the pubic bone and put a marker (Figures 1 and 2). According to the markers, the parameters were measured (Figure 2) and correspondences were compared.

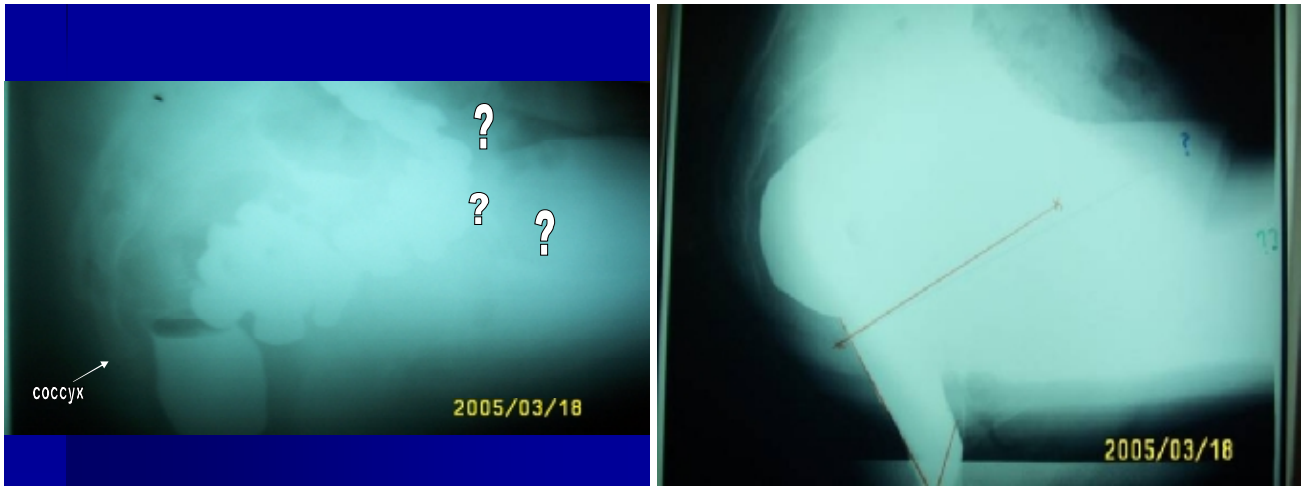

Figure 1: Symphysis pubis (pubic bone) is obscured and 3 reviewers marked it in different sites.

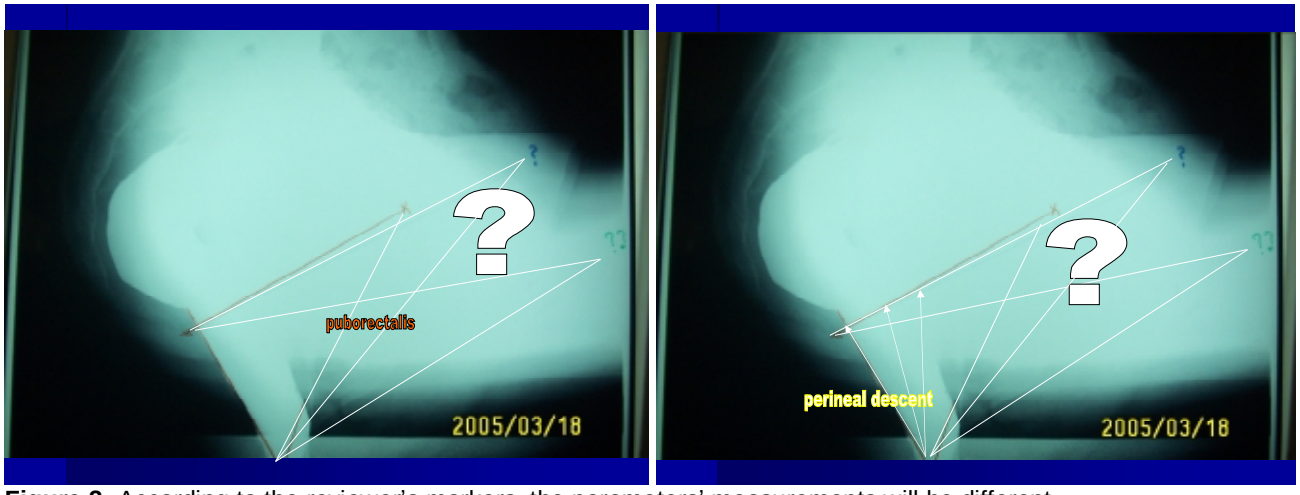

Figure 2: According to the reviewer's markers, the parameters' measurements will be different.

Results

In group B, the most anterior site of the pubic bone could be distinguished in all x-rays without any doubt (Figure 3). In group A, only in 12.5% of the x-rays, the 3 reviewers marked the most anterior site of the pubic bone in the same place and at least in 17.5% of the x-rays, one of the radiologists was not able to find the anterior site of the pubic bone and in 20%, at least one of the reviewers was in doubt to mark the most anterior site of the pubic bone, precisely. Therefore, in 37.5% of the x-rays, they were not able to find the symphysis pubis as a landmark.

The values of puborectalis lengths that were measured according to the reviewers' markers were different in 67%, 92% and 90% of the cases when comparing the results of the 1st and 2nd, 1st and 3rd, and 2nd and 3rd reviewers, respectively (Table 1). In 75% of the cases, these results were unequal when the 2 reviewers were compared. In 65% of cases, the values of puborectalis length were unequal among the 3 reviewers (Table 1).

The mean of non-equality of perineal descents that were measured according to the two reviewers' results was 79% for the cases. In 47% of the cases, the perineal descent was unequal in the review of the 3 reviewers (Table 1). The difference of puborectalis length according to the results of the reviewers was 0.2-5.4 cm and of the perineal descent was 0.2-1.8 cm. The values of parameters that were measured according to the metal marker in group B were equal in all the patients reviewed by the 3 reviewers (Figure 4).

Discussion

The pathophysiology of defecation disorders is multifactorial. An ideal test should identify the underlying cause(s) and provides guidelines for the treatment. Unfortunately, there is no such a single test. However, several techniques are available that could provide comprehensive information regarding the changes in defecation dynamics. Among these imaging techniques, defecography may provide useful information regarding rectal prolapse or levator ani dysfunction.[1,5]

Defecography results in patients being considered for symptomatic intervention should be interpreted cautiously.[2] Therefore, correct definition of the

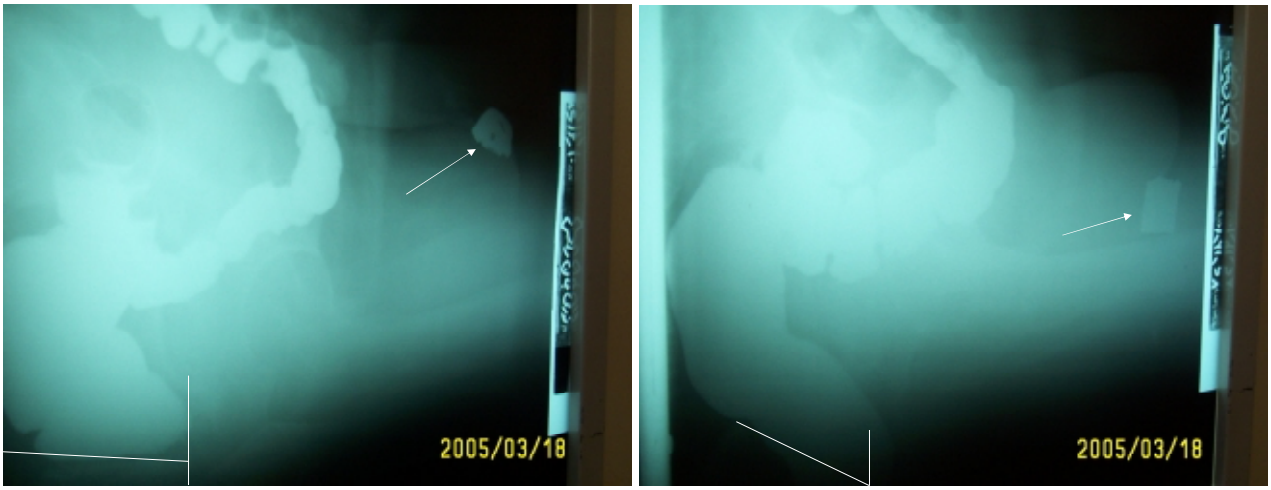

Figure 3: A radio-opaque metal was stacked on the most anterior part of symphysis pubis.

Table 1: Results of comparing the parameters according to the reviews of the 3 reviewers in group A

	According to R1 & R2	According to R1 & R3	According to R2& R3	According to R1 ,R2 &R3
Non equality of Puborectalis Distance in % of cases	67%	92%	90%	65%
Non equality of Perineal descent in % of cases	57%	95%	85%	47%

R1: 1st reviewer, R2: 2nd reviewer, R3: 3rd reviewer

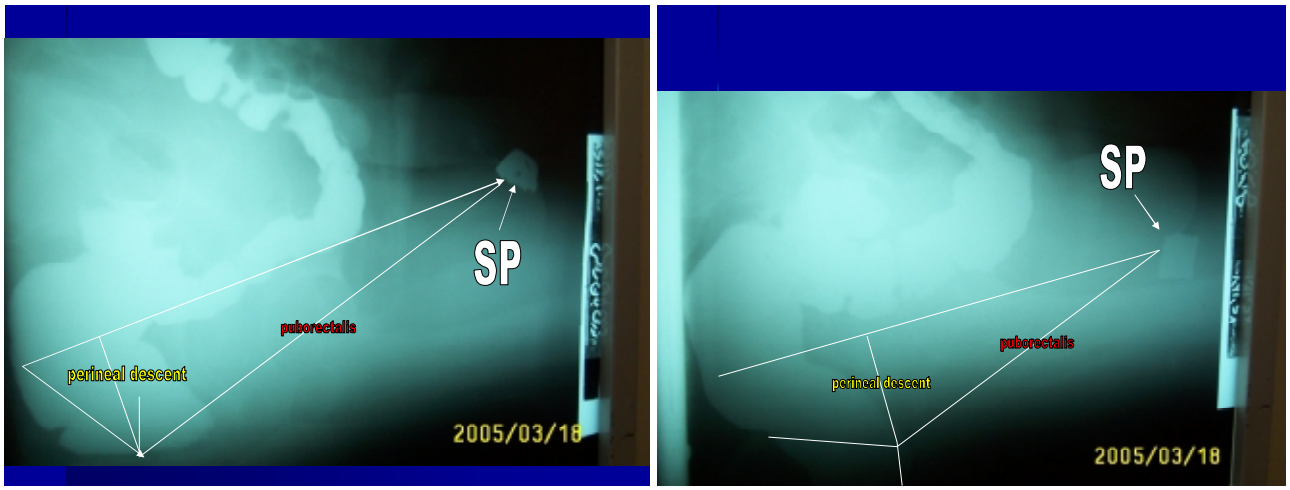

Figure 4: The symphysis pubis (SP) and parameters (perineal descent and puborectalis length) will be fixed to be review by anybody, when a radio-opaque metal has been stack on pubic symphysis.

landmarks like pubic tubercle, coccyx tip and anorectal angle are essential.[2] There may be many pitfalls and difficulties in this procedure. For this reason, different techniques, positioning and radiation doses were advised.[2-4,6,7] One of the problems in this procedure is obscured pubic tubercle in a number of x-rays. This is due to the patient's position in front of the radiating tube that sits laterally.

In this study, to overcome this problem, we placed a piece of metal on the most anterior part of pubic bone of half of the patients (Group B). In 40 patients with metal placement, there was no difficulty in finding the land marks. However, in patients without metal, only in 12.5% of the x-rays, the pubic tubercle by 3 reviewers was identical and in 37.5% of the x-rays, the 3 reviewers were not able to locate the pubic tubercle exactly. Only in 12.5% of the cases, the values of parameters could be equal depending on the markers which were placed by the 3 reviewers. If there is no metal marker on pubic bone, the difference of measurement of perineal descent may be up to 95% and in puborectalis measurement may be up to 92% (Table 1). These results revealed that it is advisable to put a radio opaque material on the most anterior part of pubic bone to have a fixed point for determination of parameters ($P<0.05$).

By placing a metallic element on the most anterior site of the symphysis pubis, the parameters in defecography will be accurately evaluated and measured.

Acknowledgement

The authors would like to thank the Center for Development of Clinical Studies of Nemazee Hospital for editorial assistance.

Conflict of interest: None declared.

References

1 Rao SS, Sun WM. Current techniques of assessing defecation dynamics. *Dig Dis* 1997;**15 Suppl 1:**64-77.

2 Freimanis MG, Wald A, Caruana B, Bauman DH. Evacuation proctography in normal volunteers. *Invest Radiol* 1991;**26(6):**581-5.

3 Ginai AZ. Evacuation proctography (defecography). A new seat and method of examination. *Clin Radiol* 1990;**42(3):**214-6.

4 Goei R. Defecography: principles of technique and interpretation. *Radiologe* 1993;**33(6):**356-60.

5 Johansson C, Ihre T, Holmstrom B, Nordstrom E, Dolk A, Broden GA. A combined electromyographic and cineradiologic investigation in patients with defecation disorders. *Dis Colon Rectum* 1990;**33(12):**1009-13.

6 Karasick S, Ehrlich SM. Is constipation a disorder of defecation or impaired motility?: distinction based on defecography and colonic transit studies. *AJR Am J Roentgenol* 1996;**166(1):**63-6.

7 Jorge JM, Wexner SD, Ger GC, Salanga VD, Nogueras JJ, Jagelman DG. Cinedefecography and electromyography in the diagnosis of nonrelaxing puborectalis syndrome. *Dis Colon Rectum* 1993; **36(7):**668-76.