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Mri Defecography – Review of Cases At Tertiary Care Hospital

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A B S T R A C T

Background: Chronic constipation often results from underlying functional pelvic floor disorders, which are frequently underdiagnosed. MRI defecography has emerged as a preferred modality for dynamic evaluation of these disorders due to its high soft tissue contrast and lack of ionizing radiation.
Aim: To evaluate the spectrum of pelvic floor abnormalities in patients with chronic constipation using MRI defecography at a tertiary care hospital.
Materials and Methods: A retrospective observational study was conducted on 25 patients (12 males, 13 females; age range: 21–70 years) referred from the Gastroenterology Department of Noble Hospital Hadapsar Pune from January 2024 to December 2024. All patients underwent MRI defecography using a Magnetom vida 3T scanner. Static and dynamic sequences were acquired and analyzed for structural and functional abnormalities including rectocele, cystocele, enterocele, descending perineum syndrome, and spastic perineum syndrome.
Results: Descending perineum syndrome was identified in 52% of patients, characterized by elongation of the H and M lines and increased anorectal angle during straining and defecation. Rectocele (100%), cystocele (62%), and recto-rectal intussusception (15%) were common associated findings. Spastic perineum syndrome was present in 44% of cases, with persistent puborectalis impression and minimal change in anorectal angle. One patient exhibited isolated hiatal enlargement without associated structural defects.
Conclusion: MRI defecography is a valuable diagnostic tool for evaluating pelvic floor dysfunction in patients with chronic constipation. It provides detailed insights into dynamic anatomical changes and helps guide appropriate clinical management. Its use in tertiary care settings should be encouraged, especially in patients with refractory symptoms.

Keywords: MRI defecography, pelvic floor dysfunction, chronic constipation, descending perineum syndrome, spastic perineum syndrome, rectocele

INTRODUCTION

Chronic constipation is a prevalent gastrointestinal disorder that significantly impairs quality of life and imposes a considerable economic burden on healthcare systems worldwide [1]. While many patients respond to conservative measures and pharmacotherapy, a subset of individuals experience persistent symptoms due to underlying pelvic floor dysfunction [2]. Functional disorders such as anismus, rectocele, enterocele, and descending perineum syndrome often go undiagnosed without appropriate imaging tools [3].

Defecography is an essential tool in the evaluation of pelvic floor disorders, offering dynamic insight into rectal evacuation and pelvic organ movement. Conventional fluoroscopic defecography has been the mainstay in such evaluations; however, it involves ionizing radiation and provides limited soft tissue contrast [4]. In contrast, Magnetic Resonance Imaging (MRI) defecography has emerged as a superior alternative, offering excellent soft tissue resolution and the advantage of multiplanar dynamic imaging without radiation exposure [5].

MRI defecography allows detailed assessment of the pelvic floor compartments during various phases of defecation (rest, squeezing, straining, and simulated evacuation) and is especially valuable in identifying structural and functional

abnormalities such as rectocele, cystocele, enterocele, internal intussusception, and spastic or descending perineum syndromes [6,7].

Given its increasing utilization and diagnostic value, MRI defecography plays a pivotal role in the management of chronic constipation and related pelvic floor disorders. However, data from Indian tertiary care settings remain limited. This study aims to retrospectively evaluate the spectrum of findings in patients with chronic constipation undergoing MRI defecography at a tertiary care hospital and to highlight the imaging features of various pelvic floor dysfunctions encountered.

MATERIALS AND METHODS

Source of Data

This retrospective observational study was conducted on cases referred from the Department of Gastroenterology at Noble Hospital Hadapsar Pune. All cases that underwent magnetic resonance (MR) defecography for evaluation of chronic constipation over 12 months (January 2024 to December 2024) were included.

Study Design and Duration

The study was retrospective and observational in design, conducted over a period of one year from January 2024 to December 2024.

Sample Size

A total of 25 patients who underwent MR defecography during the study period were retrospectively analyzed.

Study Population

Inclusion Criteria

- Patients referred by the Department of Gastroenterology with a clinical history of chronic constipation.
- Patients suspected to have a functional derangement of the pelvic floor.
- Patients who underwent MR defecography.

Exclusion Criteria

- Patients with ferromagnetic implants, pacemakers, or aneurysm clips.
- Patients aged below 10 years.
- Patients with known or suspected neoplasm of the rectum.

Imaging Protocol

All patients underwent MR defecography using a **Magnetom vida 3T scanner**. The imaging protocol included:

a) Equipment

- MRI Scanner: Magnetom vida 3T

b) Imaging Sequences

- **Static Sequences:**
  - T2-weighted axial
  - T2-weighted coronal
  - T2-weighted sagittal
  - SPAIR (Spectral Attenuated Inversion Recovery) axial
- **Dynamic Phases (T2 sagittal):**
  - At rest
  - During maximal sphincter contraction (squeezing)
  - During maximal straining
  - During simulated defecation

c) Image Interpretation

Images were analyzed for anatomical and functional abnormalities using the following measurements:

- **H line** and **M line**: Assessed in relation to the pubococcygeal (PC) line.
- **Anorectal angle (in degrees)**: Measured during each of the four phases—rest, squeezing, straining, and defecation.

Additional findings were noted for:

- Rectal abnormalities

- Bowel loop descent
- Urinary bladder descent
- Prostate positioning (in male patients)
- Presence of free fluid or pelvic lymphadenopathy
- Any other incidental pelvic pathology

Data Analysis

- Images from all 25 MR defecographic examinations (age range: 20–70 years; mean age: 45.6 years) were reviewed.
- Dynamic MRI images were evaluated in four phases: rest, squeezing, straining, and defecation.
- Parameters assessed included the presence and degree of descent of the urinary bladder, rectum, and small bowel loops.
- Associated abnormalities such as rectocele, enterocele, and internal intussusception were also recorded.
- Data were analyzed descriptively, and the findings were interpreted by two experienced radiologists independently.

RESULTS AND OBSERVATIONS

1. DISTRIBUTION OF PATIENTS ACCORDING TO AGE AND SEX

In this present study of 25 patients, 12 were men (48%) and 13 women (52%)(TABLE 1). The patients age ranges from 21yrs- 70 years with most of the patients in the age group of 40-50yrs (TABLE 2).

Table 1: Distribution of Patients According to Sex

Sex	Number of Patients	Percentage (%)
Male	12	48%
Female	13	52%
Total	**25**	**100%**

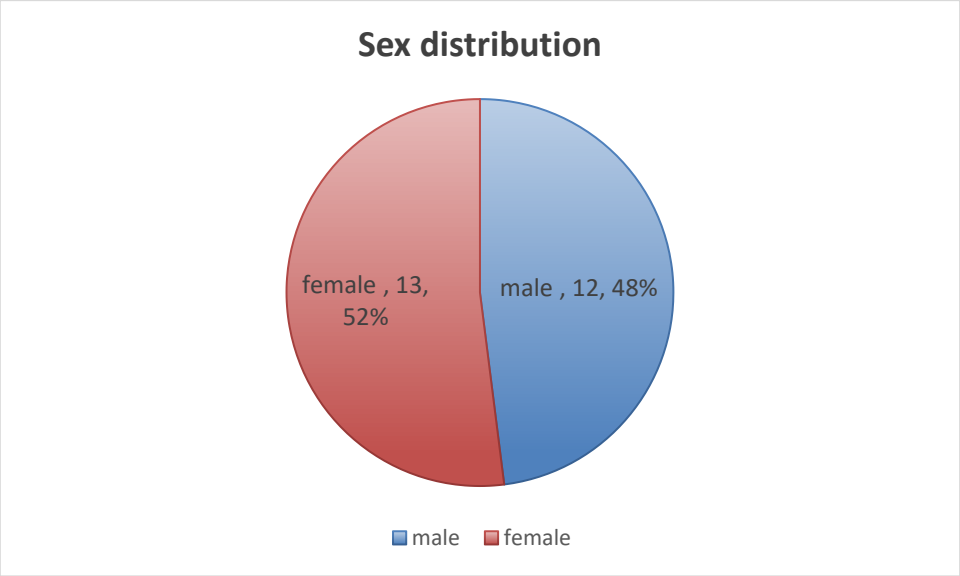


Fig .1: Sex Distribution

Table 2: Distribution of Patients According to Age

Age Group (Years)	Number of Patients	Percentage (%)
21–30	2	8%
31–40	6	24%
41–50	8	32%
51–60	6	24%
61–70	3	12%
Total	**25**	**100%**

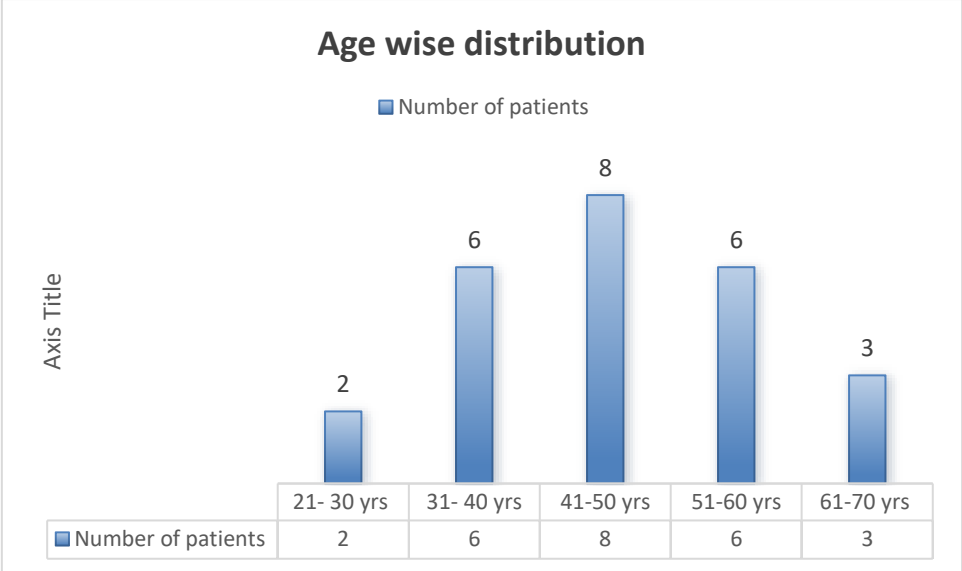


Fig. 2: Age Distribution

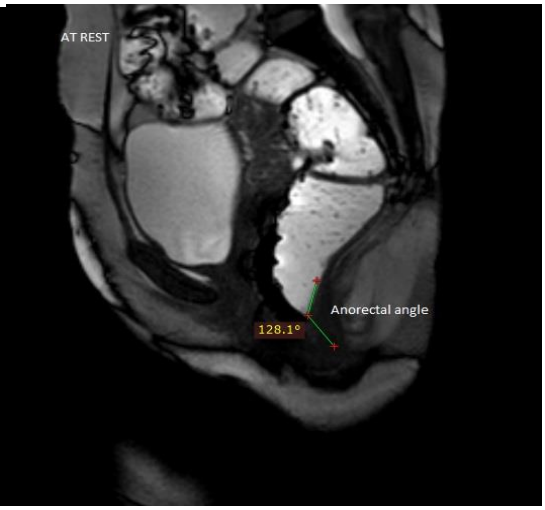
2. CLINICAL PRESENTATION:

Patients presented with chronic constipation (mostly), with some presenting with prolapse and incontinence.

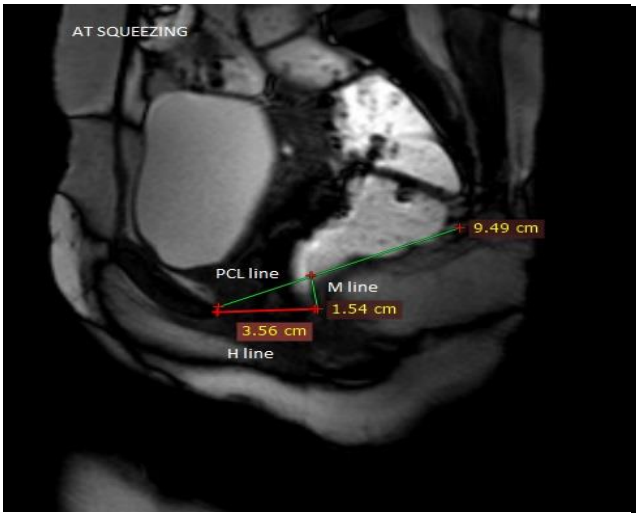
3.RADIOLOGICAL INTERPRETATION:

- Descending perineum syndrome –
  - The number of patients with features suggestive of Descending perineum syndrome was 13. In all these patients elongation of H line and M line in straining and defecation phases observed (Fig.1a to Fig.1h)
  - **Descending Perineum syndrome –**

FIG 1a



Fig; 1b



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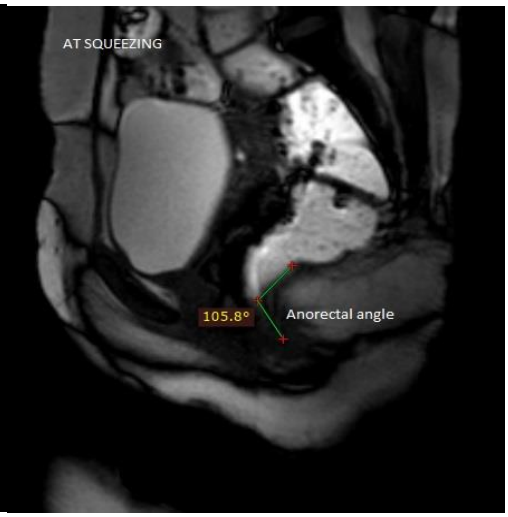
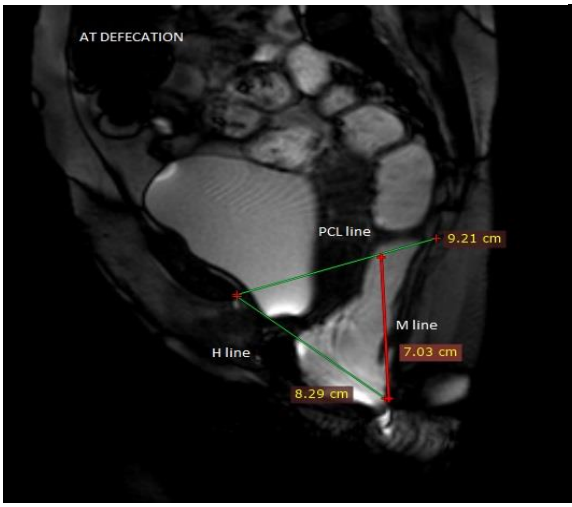


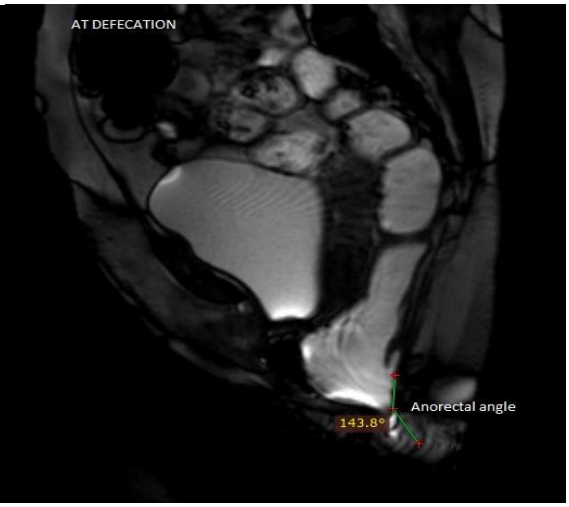
Fig; 1d

Fig 1e

Fig; 1f



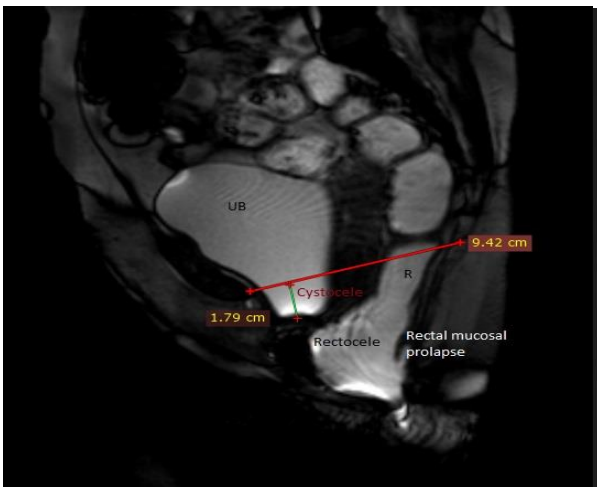
Fig; 1g



Fig; 1h

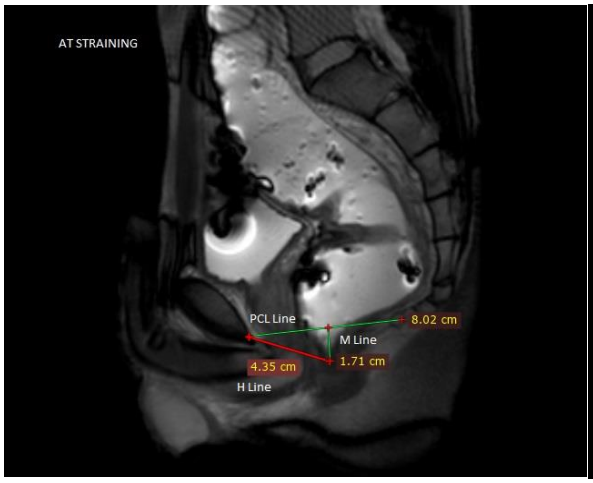
- Anorectal angle was also found to be more obtuse. These features were associated with rectocele (100%), cystocele (62%), uterine prolapse (15%), and recto-rectal intussusception (15%). (Fig.1i)

- One patient presented with elongation of the H line and M line in straining and defecation phases. However, it was not associated with rectocele, enterocele, or cystocele, hence reported as anorectal junction descent with hiatal enlargement.
- Spastic perineum syndrome –
- The number of patients with features suggestive of Spastic perineum syndrome was 11. In all these patients, persistent posterior puborectalis impression and no change in anorectal angle in straining and defecation phase were observed (Fig.2a to 2f). These features were associated with rectocele (27%).

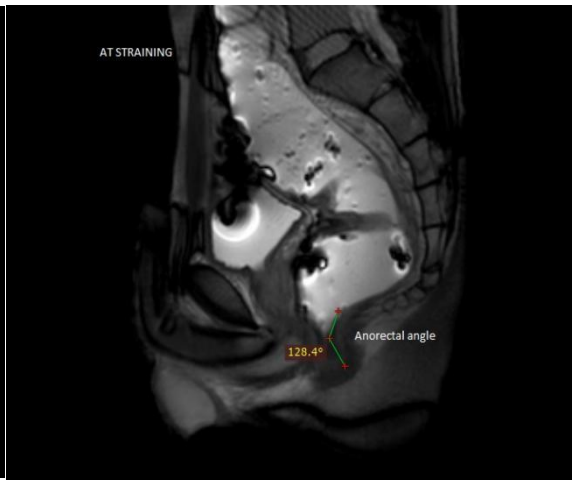


Fig; 2a

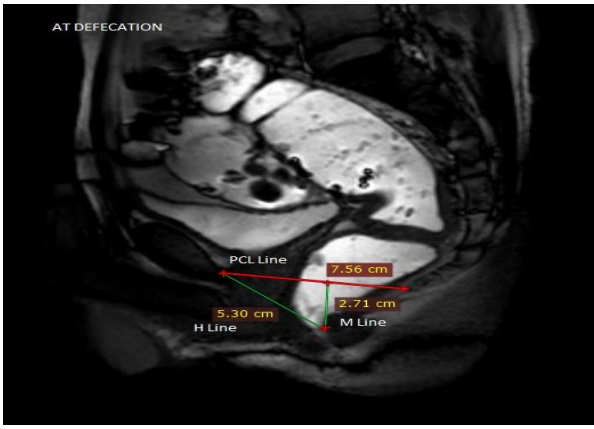
Fig; 2b



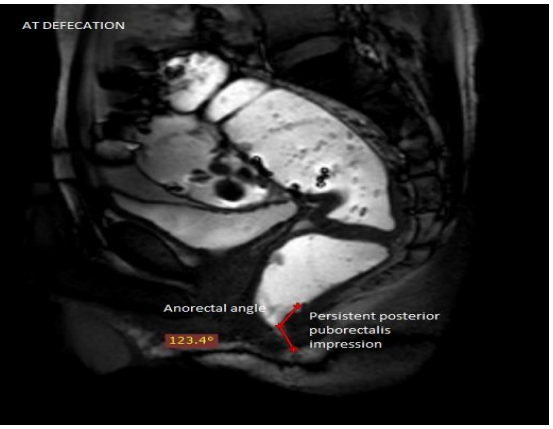
Fig; 2c



Fig; 2d



Fig;2e



Fig; 2f

DISCUSSION

Pelvic floor dysfunction remains an underdiagnosed but important cause of chronic constipation, particularly in patients unresponsive to medical therapy. MRI defecography has emerged as a powerful diagnostic tool in evaluating such patients, offering radiation-free, high-resolution, multiplanar imaging of the pelvic floor compartments [1].

In the present study, a slight female predominance (52%) was observed, which is consistent with the known epidemiology of pelvic floor disorders. The age group most affected was 41–50 years, correlating with hormonal changes and obstetric history, which are known risk factors for pelvic floor weakness [2]. Several studies have reported a higher incidence of pelvic floor dysfunction in women, especially multiparous women, due to stretching or injury to pelvic floor structures during vaginal delivery [3,4].

MRI defecography provides valuable dynamic functional information that static imaging fails to capture. In our cohort, **Descending Perineum Syndrome** was identified in 52% of patients, with hallmark features such as elongation of the H and M lines during straining and defecation, as well as an increased anorectal angle. These findings align with prior literature where elongation of the H line (>6 cm) and M line (>2 cm) indicate significant pelvic floor descent [5]. Descending perineum syndrome was often accompanied by **rectocele (100%)**, **cystocele (62%)**, **uterine prolapse (15%)**, and **recto-rectal intussusception (15%)**, findings consistent with other large case series [6].

Spastic perineum syndrome was noted in 44% of patients in our study. This condition, also termed non-relaxing puborectalis syndrome or anismus, is characterized by a persistent impression of the puborectalis muscle on the posterior rectal wall with minimal or no change in the anorectal angle during straining [7]. This pattern suggests failure of puborectalis relaxation, which hinders effective evacuation. MRI defecography has been proven to be more sensitive than fluoroscopic studies in detecting this abnormality due to its superior soft tissue contrast and multiplanar capability [8].

Rectocele was a frequent finding in both groups but was more prevalent in patients with descending perineum syndrome. This supports the hypothesis that pelvic floor descent predisposes to structural weakness and bulging of the anterior rectal wall [9]. Interestingly, one case in our study demonstrated isolated descent of the anorectal junction without associated cystocele or rectocele, indicating hiatal enlargement, a finding that has been described in other functional disorders of the pelvic floor [10].

The limitations of our study include its retrospective nature and relatively small sample size. Despite this, our findings provide clinically relevant insights and reinforce the role of MRI defecography in diagnosing functional pelvic floor disorders.

Overall, MRI defecography not only aids in identifying specific syndromes but also provides a comprehensive anatomical and functional assessment of the pelvic floor, thereby influencing management strategies ranging from physiotherapy and biofeedback to surgical intervention.

CONCLUSION

MRI defecography is a valuable, non-invasive imaging modality for the comprehensive evaluation of pelvic floor dysfunctions in patients with chronic constipation. It enables detailed anatomical and dynamic assessment across multiple phases of defecation, offering superior soft tissue contrast without radiation exposure. In our study, the most common findings were features suggestive of descending perineum syndrome and spastic perineum syndrome, often associated with structural abnormalities such as rectocele and cystocele.

The results underscore the utility of MRI defecography not only in accurately diagnosing functional disorders but also in guiding clinical management and treatment planning. Given its diagnostic precision and patient safety profile, MRI defecography should be considered a frontline tool in the evaluation of complex pelvic floor disorders, especially in tertiary care settings.

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