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Original Research Article

Clinical, endoscopic and radiological assessment of patients with obstructed defecation: findings and management at a District General Hospital

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ABSTRACT

Background: The aim of the study was to determine the diagnostic value of clinical, endoscopic and proctographic assessment as well as clinical outcomes in patients with obstructed defaecation (OD). The study also examined correlation between clinical/endoscopic findings and proctogram in the diagnosis of rectocele and intra-rectal intussusception (IRI).
Methods: Patients presenting with symptoms of OD between January-December 2018 were assessed with manual examination, endoscopy and defecation proctogram. Patients were followed for 2-3 years for clinical outcomes.
Results: There were 65 female (97.01%) and 2 male patients (2.98%), with an average age of 57.77 (34-88) years. Main indications were OD, altered bowels, faecal urgency and rectal bleeding. A total of 67 X-ray defecating proctograms and 77 endoscopies were performed. Main findings on clinico-endoscopic examination were IRI (44), rectocele (36) and haemorrhoids (21). Main findings on proctogram were rectocele (59), IRI (56) and enterocele (13). Endoscopic assessment showed sensitivity: 55.93%, specificity: 62.50% and accuracy: 56.72% in diagnosing rectocele when compared with the diagnostic confirmation on proctogram. Combining manual assessment with endoscopic findings improved sensitivity (76.27%) and accuracy (68.66%). Similar improvement was also noted in the sensitivity (61.40 to 66.67%), specificity (47 to 58%), and accuracy (53.73 to 58.21%) in diagnosing IRI when compared with the diagnostic confirmation on proctogram. Majority of the patients improved with conservative measures; however, surgical intervention was required in 13 patients.
Conclusions: Although manual examination enhances endoscopic assessment in diagnosing rectocele and IRI, proctogram is still required for objective assessment. Management of OD remains mainly conservative, with surgical intervention required in some patients.

Keywords: Obstructed defecation, Rectocele, Intussusception, Proctogram, Endoscopy

INTRODUCTION

Obstructed defecation (OD) is a form of primary or idiopathic constipation alongside Slow Transit Colon (STC) and constipation pre-dominant irritable bowel syndrome (IBS-C).[1] It is not uncommon in the Western world and a recent study has shown a prevalence of functional constipation in 7.9-8.6% of adult population in the United States, Canada and the United Kingdom.[2] OD is characterised by infrequent bowel motions, incomplete stool evacuation despite frequent visits to the toilet, urgency to open bowels, manual evacuation, need to self-digitate or put pressure on the perineum to help stool evacuation.[3] Feeling of pelvic heaviness, abdominal bloating and pain may also be associated features. Persistent straining to evacuate stools can in turn lead to

the formation of haemorrhoids, rectal bleeding and solitary rectal ulcer syndrome (SRUS).[4] Rome 1V criteria has been suggested to identify patients with OD and include at least two of these symptoms over the preceding 3 months: (1) less than three spontaneous bowel movements per week; (2) straining for more than 25% of defecation attempts; (3) lumpy or hard stools for at least 25% of defecation attempts: (4) sensation of anorectal obstruction or blockage for at least 25% of defecation attempts; (5) sensation of incomplete defecation for at least 25% of defecation attempts; and (6) manual manoeuvring required to defecate for at least 25% of defecation attempts.[5] OD may be caused by either anatomical abnormalities and/or neuro-physiological irregularities, therefore, it is very important to understand the aetiology as well as the knowledge of various investigations used to differentiate between these causes. Anatomical causes include pelvic floor dysfunction due to conditions such as rectocele, sigmoidocele, enterocele, pelvic floor descent and intra-rectal intussusception (IRI).[1] Increasing age has been shown to have influence over the incidence of these conditions in women with OD.[6] Anismus or dyssynergic defecation is a major component of OD and has been defined as an inappropriate contraction or inadequate relaxation of the pelvic floor muscle during defecation.[7] Patients with anal fissure, haemorrhoids and solitary rectal ulcer are frequently noted to have functional evacuation disorder.[8] A past medical history of difficult labour requiring forceps delivery and midline episiotomy wounds is significantly associated with damage to the anal sphincters and/or pelvic floor musculature.[9] Hysterectomy can further add to the worsening of OD, possibly due to loss of pelvic floor support.[10] Findings from a recent study has reported an increased likelihood of developing pelvic prolapse symptoms and OD in patients with prior hysterectomy and prior pelvic prolapse or anti-incontinence surgeries when compared with women without prior such surgeries.[11] A slow transit colon or a long redundant loop of sigmoid colon will also result in chronic constipation.[12,13]

OD forms a significant part of clinical conditions presenting in colorectal clinics and pose a challenging clinical problem in terms of investigation, correct diagnosis and clinical management. Investigations to assess OD include clinical, physiological, radiological and endoscopic measures. Endoscopic assessment is accomplished by doing proctoscopy, flexible sigmoidoscopy or a full colonoscopy. Physiological tests include ano-rectal manometry and balloon expulsion tests while dynamic assessment of defecation is achieved by X-ray video procotogram or Magnetic Resonant (MR) proctogram.[14,15]

Endoanal and trans-perineal ultrasound can help to evaluate the complex anatomy of the region and its dynamic functionality.[16] Assessment of the colon transit time can be achieved by ingestion of capsules containing metallic markers and monitoring their excretion from the colon with a series of X-rays (colon transit study).[17] The aim of the study was to assess the diagnostic yield of clinical, endoscopic and radiological examination in patients presenting with OD at a District General Hospital over a period of one year, as well as to ascertain the degree of correlation between clinico-endoscopic examination and X-ray proctogram in the diagnosis of rectocele and IRI. The aim of the study was to establish clinical outcomes in these patients over a period of 2 to 3 years of follow-up.

METHODS

This was a prospective study of correlational design and includes all consecutive patients presenting with symptoms of OD to our colorectal clinic that also provides pelvic floor service under the care of a dedicated colorectal and pelvic floor surgeon. The study covered a period of 12 months (January 2018-December 2018).

All patients underwent clinical examination in the outpatient clinic or in the endoscopy suite by the senior author and involved digital/manual assessment. This included looking for evidence of scars in the perianal/perineal area suggesting previous surgery or trauma, IRI, rectocele, mucosal or overt rectal prolapse, external haemorrhoidal tissue and pelvic floor descent. Patients were also checked for resting anal sphincter tone as well as on squeezing. Endoscopic assessment was done by either flexible sigmoidoscopy or colonoscopy, and focussed on the presence of IRI, solitary rectal ulcer, excessive scope looping in the sigmoid colon suggesting a redundant loop, as well as degree of the efficiency of the bowel preparation (a poor bowel preparation might indicate a slow transit colon).

All patients were referred for an X-ray proctogram for further assessment of the pelvic floor and an additional colon transit study where indicated. Patients with red flag symptoms who fulfilled the two-weeks criteria for colorectal cancer referral underwent a full colonoscopy. Patients were routinely referred to the pelvic floor physiotherapy department for assessment of rectal evacuation and pelvic floor exercises where indicated. Patients were discharged if they improved with dietary adjustments, lifestyle changes, physiotherapy, biofeedback, colon irrigation or were further discussed in a dedicated pelvic floor multi-disciplinary team (MDT) meeting. Surgery was offered to patients who continued to be symptomatic and failed to show any improvement with conservative management. Patients were followed up for a period of 2 to 3 years to establish clinical outcomes.

Data for the study was prospectively collected using Unisoft GI endoscopy reporting system (Unisoft Medical Systems, United Kingdom), Centricity P.A.C.S radiology database (G.E. medical systems, United Kingdom) and Lorenzo electronic patient records (DXC Technology, United Kingdom). Data was analysed for correlation between clinical, endoscopic and proctographic diagnosis of rectocele and IRI using statistical tests of sensitivity,

specificity, positive predictive value (PPV), negative predictive value (NPV), positive likelihood ratio (PLR), negative likelihood ratio (NLR) and accuracy using Graph Pad In Stat Software (La Jolla California USA).

RESULTS

A total of 67 patients were recorded during this period, including 65 female (97.01%) and 2 male patients (2.98%). The average age of the patients was 57.77 years (34-88 years), with 67% of the patients older than 50 years of age. The main indication for referral was OD; other indications included new onset altered bowels (18), faecal urgency (11), fresh rectal bleeding (10), faecal incontinence (5) and abdominal pain (4). A total of 67 proctograms and 77 endoscopies were performed (43 colonoscopies and 34 flexible sigmoidoscopies; 10 patients had both sigmoidoscopy and colonoscopy). Main findings on combined clinical and endoscopic examination were IRI (44), rectocele (36), haemorrhoids (21), perineal descent (14), diverticular disease (15), colon polyps (5), and overt rectal prolapse (1). Main findings on the X-ray proctogram were rectocele (59), IRI (56), enterocele (13), perineal descent (3), rectal prolapse (3), and retention of neo-stool after attempted evacuation in 50 patients.

In the assessment of rectocele in these patients, endoscopic examination showed: sensitivity: 55.93%, specificity: 62.50%, PLR: 1.49, NLR: 0.71, PPV: 91.67%, NPV: 16.13%, disease prevalence: 88.06%, and an accuracy of 56.72% when correlated with the diagnostic confirmation on X-ray defecating proctogram. After the results of the digital rectal and clinical assessment of the pelvis were combined with endoscopic examination, there was an improvement in the sensitivity (76.27%), NLR (1.90) and accuracy (68.66%) in the diagnosis of rectocele, however, there was a decrease in the specificity to 12.5%, PLR to 0.87, PPV to 86.54%, and NPV to 6.67% (Table 1). Similar improvement was also noted in the sensitivity (61.4 to 66.67%), PLR (0.68 to 0.74), PPV (79.55 to 80.85%), NPV (4.35 to 5.00%) and accuracy (53.73 to 58.21%) in the diagnosis of IRI when correlated with diagnostic confirmation on X-ray proctogram (Table 2). There was no change in the specificity (10.00%), however, a slight decrease was noted in NLR (3.86 to 3.33) (Table 2). Colon transit study showed a slow transit colon in 4/41 patients.

Over a follow-up of 2-3 years, only 13/67 patients were noted to have undergone surgical intervention following a period of failed conservative treatment. Laparoscopic ventral rectopexy (LVR) was performed in 3 patients for overt rectal prolapse, 3 patients required Delorme's procedure for the correction of rectocele and two patients needed a de-functioning loop ileostomy for slow transit colon. Haemorrhoids were treated in 4 patients: rubber band ligation and excision of large peri-anal kin tags (2), trans-anal haemorrhoidal artery de-arterialisation (THD) (1) and stapled haemorrhoidopexy (1). One patient ended up with Hartmann's procedure after developing peritonitis due to stercoral perforation of the sigmoid colon. All other patients were managed with conservative measures such as dietary modification, laxatives, biofeedback, and pelvic floor physiotherapy, with colon irrigation required in 3 patients. One patient died of unrelated causes. Most patients are still under regular and close clinical follow-up.

Table 1: Endoscopic versus proctographic diagnosis of rectocele.

Statistical test	Endoscopic assessment vs proctogram	95% CI	Clinico-endoscopic assessment vs proctogram	95% CI
Sensitivity	55.93%	42.40 to 68.84%	76.27%	63.41 to 86.38%
Specificity	62.50%	24.49 to 91.48%	12.50%	0.32 to 52.65%
PLR	1.49	0.59 to 3.75	0.87	0.65 to 1.17
NLR	0.71	0.38 to 1.30	1.90	0.29 to 12.56
Disease prevalence	88.06%	77.82 to 94.70%	88.06%	77.82 to 94.70%
PPV	91.67%	81.38 to 96.51%	86.54%	82.67 to 89.65%
NPV	16.13%	9.47 to 26.12%	6.67%	1.07 to 32.09%
Accuracy	56.72%	44.04 to 68.78%	68.66%	56.16 to 79.44%

Note: PLR: Positive likelihood ratio; NLR: Negative likelihood ratio; PPV: Positive predictive value; NPV: Negative predictive value; CI: Confidence interval.

Table 2: Endoscopic versus proctographic diagnosis of IRI.

Statistical test	Endoscopic assessment vs proctogram	95% CI	Clinico-endoscopic assessment vs proctogram	95% CI
Sensitivity	61.40%	47.57 to 74.00%	66.67%	52.94 to 78.60%
Specificity	10.00%	0.25 to 44.50%	10.00%	0.25 to 44.50%
PLR	0.68	0.51 to 0.91	0.74	0.56 to 0.98
NLR	3.86	0.58 to 25.50	3.33	0.50 to 22.18
Disease prevalence	85.07%	74.26 to 92.60%	85.07%	74.26 to 92.60%
PPV	79.55%	74.39 to 83.89%	80.85%	76.21 to 84.77%

Continued

Statistical test	Endoscopic assessment vs proctogram	95% CI	Clinico-endoscopic assessment vs proctogram	95% CI
NPV	4.35%	0.68 to 23.09%	5.00%	0.78 to 25.94%
Accuracy	53.73%	41.12 to 66.00%	58.21%	45.52 to 70.15%

Note: PLR: Positive likelihood ratio; NLR: Negative likelihood ratio; PPV: Positive predictive value; NPV: Negative predictive value; CI: Confidence interval.

DISCUSSION

We conducted this study to assess the yield of clinical and endoscopic assessment, and to examine correlation between these findings and results of X-ray proctogram in the diagnosis of rectocele and IRI in patients with OD. The aim of the study was establishing clinical outcomes in these patients. Our study demonstrated that a correct diagnosis of rectocele and IRI can be made in a majority of patients on the basis of clinico-endoscopic examination with the right training and experience, as shown by the high sensitivity, positive predictive value and accuracy. This was important in terms of an early instigation of clinical management in these patients such as referral for pelvic floor physiotherapy while waiting for further confirmatory radiological tests (for example a defecatory proctogram). This way, management strategies can be discussed with patients at an early stage to address their concerns and expectations and may carry possible psychological benefits. However, our results have also shown low specificity and negative predictive values in the diagnosis of both rectocele and IRI, and therefore, the diagnosis of rectocele and IRI cannot be ruled out entirely on the basis of clinico-endoscopic examination. Therefore, further tests such as a defecatory proctogram would be required for a definitive and more objective diagnosis.

Various clinical studies have shown the value and usefulness of X-ray proctogram in the assessment of pelvic floor disorders.[14,18] Findings from our study complement previous studies and confirm that the diagnosis of pelvic floor disorders is greatly enhanced by the use of X-ray proctogram in OD. Of note, failure of complete evacuation of the contrast media was confirmed in 50 patients on proctogram demonstrating the severity of symptoms. Rectocele is a common diagnostic finding on defaecating proctogram in patients with OD and has been reported in up to 78% of symptomatic patients.[19] In our study, 52 (77.6%) patients were diagnosed with rectocele on clinic-endoscopic assessment, with a sensitivity of 76.27% when correlated with proctogram results.

However, this number increased to 59 (88%) when proctographic results were included, suggesting high prevalence of rectocele in symptomatic patients with OD. Similarly, IRI has also been shown to be a common finding present on proctogram in even asymptomatic subjects, however, it is more pronounced and full-thickness in patients with OD.[20] A previous study reported that digital and endoscopic examination will diagnose most long intussusceptions and a positive finding will need further evaluation with defecography.[21] In our study, 47 patients (70%) were diagnosed with IRI on digital rectal and endoscopic examination, with a sensitivity of 66.67% when correlated with proctographic confirmation. Overall, there were 56 patients (83.5%) diagnosed with IRI in our study when results of proctogram were included, emphasising the need for a proctogram in all patients with OD.

It is important to note that rectocele and IRI co-existed in majority of our study cohort (76%). Evacuatory symptoms in these patients may be contributable to either of the conditions, however, it is also important to be aware of the fact that rectocele and IRI can be present on proctogram with no symptoms. One study reported a considerable overlap of symptoms of rectocele and IRI, and stated that 'obstruction to evacuation' observed on proctography had no impact on the incidence of evacuatory symptoms.[22] The study concluded that selection for surgical intervention on the basis of proctographic findings may be illogical. Another study reported rectocele repair in only 12% of their symptomatic patients after fulfilling a certain criterion (defecation requiring manual assistance and these findings on MRI defecography: anterior defect >2 cm, incomplete evacuation, and the absence of perineal descent).[23] Similar trend is seen in our study as well, where surgery (Delorme's procedure) was performed to correct rectocele in only 5% of patients, with all patients reporting significant improvement in their stool evacuation during the post-operative follow-up clinic visits.

Management of OD remains complex and requires a multi-disciplinary approach. The mainstay of the treatment remains a conservative approach, with surgery reserved for seriously symptomatic patients who fail to respond to these measures.[1,24,25] Hicks et al reported significant and almost similar improvement in bowel frequency in patients with rectocele and OD when comparison was made between biofeedback and surgery for rectocele and concluded that surgery should be the last resort in these patients.[26] This statement is also supported by favourable clinical outcomes of conservative approach noted in our study population. Practice at the author's institution is to exhaust all conservative measures before surgery is offered. If no improvement is seen in the patient's symptoms with conservative approach, surgery is decided after discussion in a dedicated regional pelvic floor MDT comprising of members from the colorectal, gynaecology, urology, radiology and pelvic floor physiotherapy departments. Conservative measures were successful in containing symptoms in almost 80% of our patients during the study's follow-up period. This was possible due to active input and advice from a dedicated pelvic floor physiotherapy team regarding changes in lifestyle, dietary habits and regular pelvic floor exercise. Further support was offered in terms

of appropriate use of laxatives, bio-feedback and colon irrigation. Surgical options for ODS depend on the causative factor and will be applied if conservative measures fail.

Generally, patients would be offered laparoscopic ventral rectopexy (LVR) using biological or synthetic mesh for rectal prolapse and significant IRI, rectocele repair (Delorme's procedure or anterior/vaginal approach), and haemorrhoidectomy (closed or open) for large external haemorrhoids. De-functioning loop ileostomy is an option in extremely symptomatic patients with slow transit colon who find no benefit from conservative measures and where a pelvic procedure is not an alternative. Although a life changing procedure, a recent study has reported that most patients who had loop ileostomy for chronic constipation had no regrets.[27]

Two patients in our study with slow transit colon opted to have de-functioning loop ileostomy with significant improvement in their symptoms and quality of life. Mesh rectopexy is used as a last resort due to the potential complications of the mesh such as chronic pelvic pain, chronic infection, erosion, extrusion and perforation. An increase in the cases of medical litigation involving complications due to the use of synthetic mesh in patients with pelvic floor disorders as well as media attention has led the surgeons to review their practice and decide whether surgical approach is the ideal way of dealing with these problems. Only 3 patients in our study required LVR after overt rectal prolapse was confirmed on proctogram as well as clinical examination, and failed conservative management. No complications were reported in these patients during the follow-up period. One patient in our study required emergency Hartmann's procedure for stercoral sigmoid colon perforation, emphasising the fact that OD can be associated with acute complications such as acute peritonitis.

There was no case of colorectal neoplasia diagnosed in our study cohort, which is in line with findings from previous studies showing a low risk of diagnosing colorectal neoplasia when colonoscopy is performed to investigate constipation.[28,29]

Our study represents the generality of practice in the management of patients with OD in a busy District General Hospital. Our results are based on prospectively gathered data and reflects the practice of a single experienced colorectal/pelvic floor surgeon, and as such, eliminates any operator bias. Although there are studies that compare the diagnostic value of trans-labial ultrasound assessment against the definitive diagnosis of rectocele and IRI on defecating proctogram, not much evidence is available on the diagnostic value of clinico-endoscopic assessment in patients with OD.[30,31]

We agree that such an assessment, although useful, was not sufficient on its own and requires further objective evaluation, as is also suggested by Karlbom et al.[21] We recognised the fact that our study had limitations as a single-centre study with no comparative assessment due to scarcity of similar studies. Our study demonstrated that clinical and endoscopic assessment of patients with ODS gives valuable initial information to decide further investigations and long-term management. Conservative treatment in ODS is safe, feasible and effective in a significant proportion of patients. This has significant clinical and practical implications, as unnecessary surgical interventions can be avoided which otherwise can amount to medical negligence and bring litigation.

CONCLUSION

Clinical and endoscopic assessment gives a good diagnostic yield in the investigation of OD in the hands of an experienced pelvic floor surgeon. However, more prospective and comparative studies are needed to offer robust evidence on the subject. Treatment strategies in OD may be planned in advance based on clinical and endoscopic assessment of the pelvic floor, however, further objective diagnostic confirmation will be needed by performing a defecating proctogram. Mainstay of the treatment of OD is conservative approach. It is possible to manage these patients at DGH level subject to availability of an experienced pelvic floor team with MDT approach. OD is an ever-growing and complex clinical challenge; therefore, it is important to train medical/healthcare staff in the pathophysiology, investigation and management of OD. More objective assessment such as the use of quality-of-life questionnaires before and after conservative and surgical treatment is advised in patients with OD to obtain more robust evidence in terms of clinical outcomes.

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