

## DEFECATION PROCTOGRAPHY AND TRANSLABIAL ULTRASOUND IN THE INVESTIGATION OF DEFECATORY DISORDERS

### Hypothesis / aims of study

Obstructed defecation is a common complaint in women and one of the two main causes of constipation. A number of aetiological factors have been described, with rectocele, rectal intussusception/ prolapse, anismus and colpocele (compression of the rectal ampulla by mild uterine prolapse) being potential causes. Any of these conditions can lead to straining at stool, vaginal/perianal digitation and/or a sensation of incomplete emptying. The anatomical abnormality leads to behavioural change which in turn exacerbates the original abnormality in a vicious cycle, leading to worsening of symptoms and more straining.

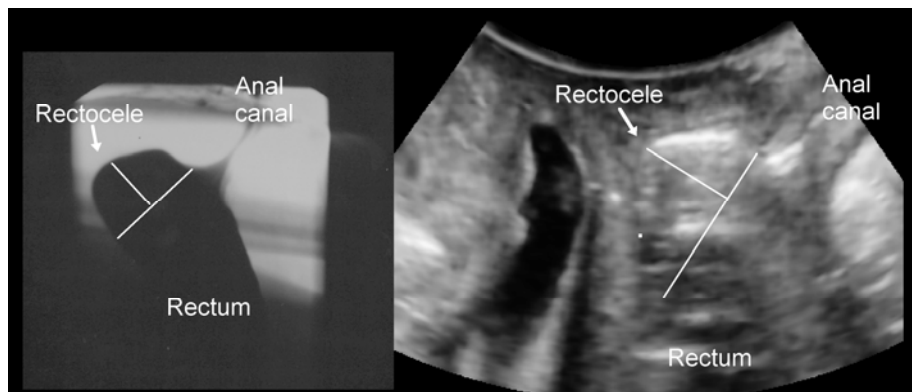
Defecation proctography (DP) is the standard diagnostic method used to investigate obstructed defecation. It involves the insertion of barium paste and evacuation of the same in front of a fluoroscopic imaging system[1]. We have recently shown that translabial ultrasound (US) on Valsalva can demonstrate rectocele, enterocele, rectal intussusception and levator activation[2] and that there is a strong correlation between ultrasound findings and symptoms of obstructed defecation[3]. In order to define the relative advantages and disadvantages of translabial ultrasound and defecation proctography and to determine agreement between findings we performed a comparative clinical study.

### Study design, materials and methods

37 women booked for DP for the clinical diagnosis of obstructed defecation were offered participation. In 34 women this involved an additional US examination; 3 patients authorised us to use previously acquired US data. Written informed consent was obtained, and the study had been approved by the local Human Research Ethics Committee.

Multiple fluoroscopic images were acquired using a Philips MD3 digital C-arm X-ray machine. Thin Barium or Liquid Polybar Plus was instilled into the rectum in the first pass followed by a Liquid Polybar/ starch mixture. Images were acquired at rest, during straining, defecation and coughing. The procedure was videotaped. Translabial US was performed using a GE Kretz Voluson 730 expert system, after bladder emptying, supine, at rest and on maximal Valsalva[2]. Volume data was archived and analysed at a later date, blinded against all clinical data and DP results. All patients rated the inconvenience and discomfort associated with the two procedures on a scale of 0-10.

Using both methods, we determined the anorectal angle at rest and on Valsalva, presence/ absence of a rectocele and its maximum depth, as well as the presence/ absence of rectal intussusception or prolapse. Measurements were undertaken by different operators who were blinded against all other clinical and imaging data.



*Figure 1: Rectocele on fluoroscopy (left) and translabial ultrasound (right). The rectocele measured 15 mm both on xray and ultrasound imaging, an unusual degree of agreement.*

*The fluoroscopic image is rotated for ease of comparison.*

### Results

All patients described symptoms of obstructed defecation. Their mean age was 53 (26-80) years. Two had had previous surgery for this problem. 6 women did not attend their defecation proctogram- one fell pregnant, and five others either cancelled or did not attend, leaving 31 cases for direct comparison. One of those had an incomplete proctogram due to inability to defecate. Patients rated the discomfort/ inconvenience of the ultrasound examination at 1.58 out of 10 (SD 1.57), whereas the defecation proctogram was rated at 5.71 (SD 3.52),  $p < 0.001$ . On ultrasound we diagnosed 18/37 (49%) rectoceles and 10/37 (27%) rectal intussusceptions, and the anorectal angle was measured at a mean of 119 (SD 16) at rest and 115 (SD 17) on Valsalva. On defecation proctography there were 22/31 (71%) rectoceles and 23/30 (77%) rectal intussusceptions or rectal prolapse. The anorectal angle was measured at a mean of 100 (SD 21) at rest and 134 (SD 15) on Valsalva. On comparing the two methods, Cohen's kappa for the diagnosis of rectocele was 0.26, and 0.09 for rectal intussusception/ prolapse. Neither anorectal angle measurements nor measurements of rectocele depth correlated significantly. Positive agreement between methods was 82% for rectocele and 88% for intussusception, but negative agreements were 43% and 28% only.

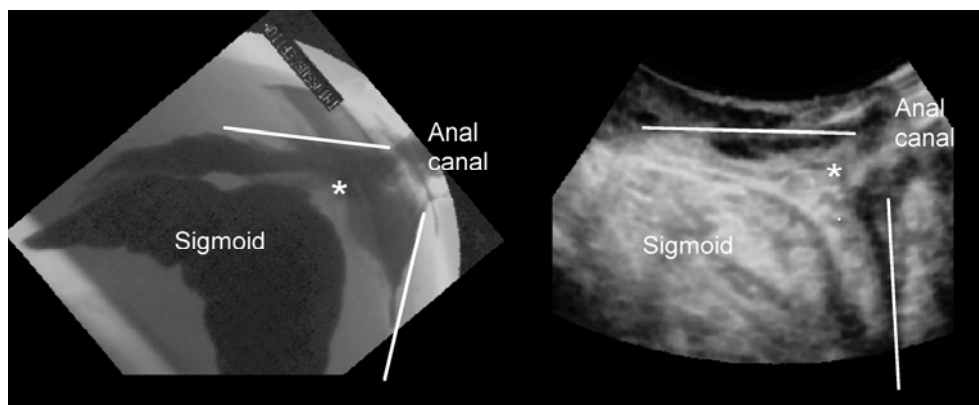


Figure 2: Rectal intussusception on fluoroscopy (left) and translabial ultrasound (right). The apex of the intussusciens is marked with a (\*). The lines show splaying of the anal canal. In this case the intussusciens is propelled by sigmoid colon, as shown on fluoroscopy.

#### Interpretation of results

In this study comparing defecation proctography and translabial ultrasound in women with defecation disorders we found poor agreement between the methods for all assessed parameters. This is not surprising, given the marked differences between methodologies. However, it is also clear that both methods can identify the same abnormalities: when ultrasound showed a rectocele or rectal intussusception, there was a high likelihood of this diagnosis being confirmed on proctography. On the other hand, proctography often diagnosed an abnormality in patients with a normal ultrasound. It is unclear whether this implies over-diagnosis on fluoroscopy or insufficient sensitivity or under-diagnosis on ultrasound, and this study is not sufficiently powered to assess correlations with symptoms.

#### Concluding message

Ultrasound assessment of the anorectum for defecatory disorders is capable of diagnosing rectocele and rectal intussusception. There are a number of advantages in using ultrasound in this setting- there is no radiation exposure for patient or staff, the ultrasound assessment is better tolerated, and it yields a wealth of other information on the lower urinary tract, uterovaginal prolapse and levator structure and function. While overall correlations between ultrasound and defecation proctography was poor, there was high positive agreement for rectocele and rectal intussusception, suggesting that the latter technique could be avoided in patients in whom these diagnoses are made ultrasonographically.

#### References

1. Br J Surg 2000; **87**:10-27.
2. Ultrasound Obstet Gynecol 2005. **26**: 73-77.
3. Aust NZ J Obstet Gynaecol 2005; **45**: 505-508

**FUNDING:** OZWAC Foundation, Penrith, Australia

**CLINICAL TRIAL REGISTRATION:** This clinical trial has not yet been registered in a public clinical trials registry.

**HUMAN SUBJECTS:** This study was approved by the Sydney West Area Health Service HREC 05-044 and followed the Declaration of Helsinki Informed consent was obtained from the patients.