

## INCONTINENZA

### **Evaluation of the use of PTQ implants for the treatment of incontinent patients due to internal anal sphincter dysfunction.**

**Colorectal Dis. 2008; 10(1):89-94 (ISSN: 1463-1318)**

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**OBJECTIVE:** This study reports the results of injectable silicone PTQ implants for faecal incontinence due to internal anal sphincter (IAS) dysfunction. **METHOD:** Twenty patients (12 women) with partial faecal incontinence aged from 55 to 65 years were treated by a PTQ implant. All patients completed the Cleveland Clinic Continence and Quality of Life questionnaire. Endoluminal ultrasound and anorectal physiological testing were performed in each patient. All implants were inserted into the submucosal plane without ultrasound guidance. **RESULTS:** Faecal continence was significantly improved up to 1 year. The Wexner continence score fell from a median of 13.05 (range, 5-20) before treatment to 4.5 (range 2-7.7) at 1 month after ( $P < 0.005$ ). This rose gradually to 6.2 (range, 0-16) at one year ( $P = 0.02$ ) and 9.4 (range, 1-20) at 2 years ( $P = 0.127$ ). There were no differences in resting or squeeze pressure before and at 3 months after treatment ( $P = 0.86$  and  $P = 0.93$ ). Fourteen (70%) patients experienced pruritus ani during the first few weeks after the procedure and one developed infection at the implant site. **CONCLUSION:** Silicone implantation is minimally invasive and technically simple. It is effective over 1 year in the treatment of faecal incontinence due to IAS dysfunction.

### **Correlation between anal sphincter defects and anal incontinence following obstetric sphincter tears: assessment using scoring systems for sonographic classification of defects.**

**Ultrasound Obstet Gynecol. 2008; 31(1):78-84 (ISSN: 0960-7692)**

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**OBJECTIVE:** To determine if there is a correlation between the sonographic extent of anal sphincter defects revealed by three-dimensional endoanal sonography (EAUS) and the degree of anal incontinence following primary repair of obstetric sphincter tears. **METHODS:** This was a follow-up study of women who had suffered anal sphincter tearing during vaginal delivery at Aalesund Hospital between January 2002 and July 2004. Incontinence was assessed by St Mark's score. The anal canal was assessed with three-dimensional endoanal sonography (EAUS). Sphincter defects were classified according to the Starck score and our new EAUS defect score. The EAUS images were interpreted by an observer blinded to other patient data. **RESULTS:** Sixty-one women were included in this study. Incontinence was reported by 32 (52%) women at a median of 21 (range, 9-35) months after delivery. Three-dimensional EAUS datasets were obtained in 55 women. There was a significant correlation between St Mark's score and our EAUS defect score ( $P = 0.034$ ), and correlation approached but did not reach significance between St Mark's score and the Starck score ( $P = 0.053$ ). There was a strong correlation between our EAUS defect score and the Starck score ( $P < 0.001$ ). **CONCLUSIONS:** There is a positive correlation between the extent of sphincter defects and the degree of anal incontinence following primary repair of obstetric sphincter tears. Our findings highlight the importance of adequate reconstruction of the anal sphincters during primary repair.

### **How to repair an anal sphincter injury after vaginal delivery: results of a randomised controlled trial.**

**BJOG. 2006; 113(2):201-7 (ISSN: 1470-0328)**

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**OBJECTIVE:** To compare two surgical techniques and two types of suture material for anal sphincter repair after childbirth-related injury. **DESIGN:** Factorial randomised controlled trial. **SETTING:** Tertiary referral

maternity unit. **POPULATION:** Women with an anal sphincter injury sustained during childbirth. **METHOD:** Women were randomised into four groups: overlap repair with polyglactin (Vicryl); end-to-end repair with polyglactin (Vicryl); overlap repair with polydioxanone (PDS); and end-to-end repair with PDS. All repairs were completed as a primary procedure by staff trained in both methods. **MAIN OUTCOME MEASURES:** Suture-related morbidity at six weeks. Bowel symptoms at 3, 6 and 12 months. Anorectal physiology at three months. Quality of life scores at 3 and 12 months. **RESULTS:** One hundred and fifty women (1.5% of deliveries) were eligible and 112 (75%) were randomised. One hundred and three (92%) attended follow up visit at 6 weeks, 89 (80%) at 3 months, 79 (71%) at 6 months and 60 (54%) at 12 months. At six weeks, there was no difference in suture-related morbidity between groups ( $P=0.11$ ) and 70% patients were completely asymptomatic. Incidence of bowel symptoms and quality of life disturbances were low, with no differences between the four groups. **CONCLUSION:** Obstetric anal sphincter repair carried out by appropriately trained staff is associated with low morbidity, irrespective of the suture material and repair method used.

## Endorectal ultrasound in the evaluation of fecal incontinence

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**INTRODUCTION** - Fecal incontinence is one of the most devastating of all physical disabilities since it affects self-confidence and personal image, and can lead to social isolation. Until recently, the evaluation of fecal incontinence was largely limited to anal manometry, electromyography (EMG), and studies of pudendal nerve latency. Although helpful, these tests provide no direct structural evidence of sphincter injury. Imaging of the anal sphincter is helpful in all patients with fecal incontinence to assess the structure and integrity of the sphincters. Newer imaging modalities, such as endorectal ultrasound (which can be performed with a transrectal ultrasound probe or with endoscopic ultrasonography) and MRI, have added to the diagnostic tools available to clinicians for the evaluation of fecal incontinence. Ultrasound imaging of the anal sphincter provides complementary structural information to the functional information that can be obtained with manometry and should be performed in combination with this test. This topic review will focus on the use of endorectal ultrasound in the evaluation of fecal incontinence. An overview of fecal incontinence is presented separately. ([See "Fecal incontinence"](#)).

**NORMAL ULTRASOUND APPEARANCE** - The normal ultrasound appearance of the anorectum has been well delineated in several studies performed on normal subjects [1-8]. Two discrete rings of tissue can be seen when using a radial scanning echoendoscope to examine the anorectum ([show radiograph 1](#)). The inner hypoechoic ring of tissue represents the internal anal sphincter (IAS), which is formed by the thickened continuation of the circular smooth muscle of the rectum. The outer hyperechoic ring of tissue represents the longitudinal muscle and the external anal sphincter (EAS), which is formed by the downward extension of the skeletal muscle of the puborectalis. The normal IAS is between 2 to 3 mm thick [2,5] and the normal EAS is between 7 to 9 mm thick [2,6,9]. The IAS becomes thicker and more hyperechoic with age, probably reflecting collagen replacement of the IAS [5]. Conversely, the EAS tends to become thinner with age [6]. The perineal body is not clearly defined with ultrasound [9,10]. The anal canal length varies from 25 mm for women to 33 mm for men [11].

There is a different configuration of the anterior part of the EAS in men and women [12]. The anterior part of this sphincter seems to be shorter and slopes downward in women. This can make demonstrating a complete 360 degree ring of the EAS in one plane difficult [9]. It is essential to recognize this variation so that one does not incorrectly diagnose an anterior sphincter defect where one does not exist. The anococcygeal ligament appears as a hypoechoic triangular structure posteriorly and can be confused as a sphincter defect in this location.

**ENDORECTAL ULTRASOUND AND EMG** - Before the development of endosonography, electromyography (EMG) was used to assess the integrity of the EAS. However, EMG studies were poorly tolerated since they required insertion of needles directly into the muscle. The first reports on the use of ultrasound to study the anal sphincter came from St. Mark's Hospital in the late 1980s and early 1990s. A study comparing electromyography (EMG) with ultrasound in 15 patients with fecal incontinence showed that endosonography could accurately identify EAS defects [13]. The correlation between EMG and ultrasound was 0.96. In addition, ultrasound was better tolerated. A follow-up study of 45 patients found that ultrasound agreed with EMG assessment of the external sphincter in all patients studied [14]. In a separate study, the same group used endosonography to direct EMG needle placement into the sphincter defect seen on ultrasound [15]. In

all of the patients where EMG was technically successful, EMG showed no evidence of electrical activity, thus confirming the accuracy of endosonography. It is largely because of these studies that endosonography has replaced EMG as the investigation of choice to identify sphincter defects.

**TEST CHARACTERISTICS** - A number of studies have reported the utility of endosonography in identifying sphincter injuries in patients with fecal incontinence ([show radiograph 2](#)) [16-33]. Several of these reports have compared the ultrasound findings to the results of surgery (sphincteroplasty). Sensitivity exceeded 90 percent in most reports; specificity is hard to determine from these studies since patients in whom a tear was not strongly suspected may not have been operated on. However, false positive results have been described. The following illustrate the range of findings:

- One study compared ultrasound and manometric findings in 20 asymptomatic nulliparous women, 20 asymptomatic parous women, and 31 women with incontinence who underwent sphincteroplasty [34]. Endosonography correctly identified all of the sphincter injuries in the women with incontinence.
- In a similar report, endorectal EUS was performed prior to surgery in 28 patients with fecal incontinence [35]. EUS correctly identified all 25 of the IAS defects and all 10 EAS defects. However, it incorrectly diagnosed an EAS defect in three patients, resulting in an overall accuracy for EUS of 89 percent.
- In the largest study to date, the ultrasound appearance was prospectively compared with the operative findings in 44 patients who underwent pelvic floor repair [36]. Endorectal ultrasound was 100 percent sensitive in detecting either IAS or EAS defects. One IAS tear seen on endosonography was not confirmed at surgery.
- The group from St. Mark's published a study prospectively comparing the results of endosonography with manometry and EMG in 12 patients who were scheduled to undergo sphincter repair [37]. Nine of the 12 patients were found to have an EAS defect at surgery. Histology was used as the gold standard. Ultrasound was superior to the other modalities with an accuracy of 100 percent for detecting a sphincter injury compared to an accuracy of 75 percent for manometry, 75 percent for EMG, and 50 percent for clinical assessment. In addition, there was an association between an EAS defect and a decreased maximum squeeze pressure on manometry.
- Other studies have found a similar association between decreased maximal squeeze pressure and decreased EAS thickness or an EAS defect [10,38]. In contrast, a similar relationship between the resting pressure in the anal canal and IAS thickness has not been documented [8,38]. The IAS increases in size with age [6,39]. Thus, a thicker IAS may actually represent replacement of the smooth muscle of the IAS by connective tissue and not more muscle mass.

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**Liverpool Ultrasound Pictorial Chart: the development of a new method of documenting anal sphincter injury diagnosed by endoanal ultrasound.**

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**OBJECTIVE:** To develop and validate a pictorial chart that documents ultrasound examination of the anal sphincter.

**DESIGN:** A new pictorial chart (Liverpool Ultrasound Pictorial Chart [LUPIC]) depicting the normal anatomy of the anal sphincter was developed. **METHODS:** To validate LUPIC, two observers documented the findings of 296 endoanal scans. Reliability was assessed between observers using kappa agreement for presence and position of sphincter defects. To validate the use of LUPIC by different observers, a video of ten endoanal ultrasound scans was reviewed by our local expert (gold standard). Seven clinicians underwent test-retest analysis. Kappa agreement was calculated to assess intra-observer and gold standard versus observer agreement for the overall presence of sphincter defects and compared with the gold standard. Complete agreement for the position and level of sphincter defects was assessed for the five abnormal scans.

**MAIN OUTCOME MEASURES:** Excellent agreement between the two observers was found for the presence (kappa 0.99), position and level of external anal sphincter defects documented using LUPIC. The intra-observer and gold standard versus observer kappa values of experienced clinicians (A-E) showed good agreement for the overall presence of sphincter defects. Complete agreement for the position and level of sphincter defects was found in 23 of 35 (66%) observations.

**CONCLUSIONS:** LUPIC is designed and validated method of documenting anal sphincter injury diagnosed by endoanal ultrasound. Standardisation of endoanal ultrasound findings by using LUPIC may help correlate the degree of damage with patient symptoms.

### Diagnostic precision of endoanal MRI in the detection of anal sphincter pathology: a meta-analysis.

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**OBJECTIVE:** This study aims to evaluate the diagnostic precision of endoanal magnetic resonance imaging in identifying anal sphincter injury and/or atrophy when compared with either endoanal ultrasound or surgical diagnosis.

**MATERIALS AND METHODS:** Quantitative meta-analysis was performed on nine studies, comparing endoanal MRI with endoanal ultrasound or surgical diagnosis in 157 patients. Sensitivity, specificity, and diagnostic odds ratio were calculated for each study. Summary receiver operating characteristic curves (SROC) and subgroup analysis were undertaken.

**RESULTS:** The overall sensitivity and specificity of endoanal MRI for external sphincter injury was 0.78 (95%CI: 0.66-0.84) and 0.66 (95%CI: 0.51-0.79), respectively. For internal sphincter injury detection, this was 0.63 (95%CI: 0.50-0.74) and 0.71 (95%CI: 0.60-0.81), respectively. For detection of atrophy, this was 0.86 (95%CI: 0.71-0.95) and 0.82 (95%CI: 0.65-0.93), respectively. The area under the SROC curve and diagnostic odds ratio were 0.84 (SE = 0.07) and 6.14 (95%CI: 2.17-17.4) for external sphincter injury, 0.79 (SE = 0.07) and 4.60 (95%CI: 1.75-12.15) for internal sphincter injury, and 0.92 (SE = 0.08) and 21.49 (95%CI: 2.87-160.64) for sphincter atrophy.

**CONCLUSION:** Endoanal MRI was sensitive and specific for the detection of external sphincter injury and especially sphincter atrophy. It may be useful as an alternative to endoanal ultrasound in patients presenting with fecal incontinence, although further clinical studies are needed to identify its best application in clinical practice.

### Anal sphincter structure and function relationships in aging and fecal incontinence

Presented at the 29th Annual Scientific Meeting of the American Urogynecologic Society, Chicago, IL, Sept. 4-6, 2008.

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**OBJECTIVE:** The objective of the study was to determine the effect of aging and continence status on the structure and function of the external (EAS) and internal (IAS) anal sphincters

**STUDY DESIGN:** Young (YC) and older (OC) continent women were compared with older women with fecal incontinence (OI). Patients completed the Fecal Incontinence Quality of Life and Fecal Incontinence Severity Index and underwent anorectal manometry and transanal ultrasound.

**RESULTS:** Nine YC, 9 OC, and 8 OI women participated. Aging was associated with a thickening of the IAS. Older incontinent women had a thinner EAS, had decreased maximum squeeze pressures, and were hypersensitive to rectal distention with decreased tolerable rectal volumes and urge to defecate at lower volumes.

**CONCLUSION:** Thickening of the IAS occurs with aging. Thinning of the EAS and a corresponding drop in squeeze pressure correlated with fecal incontinence but not aging. Rectal hypersensitivity was associated with fecal incontinence rather than aging and may play a role in the mechanism of fecal incontinence.

**Key words:** [aging](#), [external anal sphincter](#), [fecal incontinence](#), [internal anal sphincter](#)

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## Transperineal Three-Dimensional Ultrasound Imaging for Detection of Anatomic Defects in the Anal Sphincter Complex Muscles

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### Background & Aims

Three-dimensional ultrasound (3D-US) imaging is a powerful tool to visualize various components of the anal sphincter complex, that is, the internal anal sphincter (IAS), the external anal sphincter (EAS), and the puborectalis muscle (PRM). Our goal was to determine the reliability of the 3D-US imaging technique in detecting morphologic defects in the IAS, EAS, and PRM.

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### Methods

Transperineal 3D-US images were obtained in 3 groups of women: nulliparous (n = 13), asymptomatic parous (n = 20), and patients with fecal incontinence (FI) (n = 25). The IAS and EAS were assessed to determine the craniocaudal length of defects and were scored as follows: 0 = normal, 1 = less than 25%, 2 = 25% to 50%, 3 = 50% to 75%, and 4 = greater than 75%. The 2 PRM hemislings were scored separately as follows: 0 = normal, 1 = less than 50% abnormal, and 2 = greater than 50% length abnormal. Subjects were grouped according to the score as follows: normal (score 0), minor abnormality (scores of 1 and 2), and major abnormality (scores of 3 and 4). Three observers performed the scoring.

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### Results

The 3D-US allowed detailed evaluation of the IAS, EAS, and PRM. The inter-rater reliability for detecting the defects ranged between 0.80 and 0.95. Nullipara women did not show any significant defect but the defects were quite common in asymptomatic parous and FI patients. The prevalence of defects was greater in the FI patients as compared with the asymptomatic parous women.

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### Conclusions

3D-US yields reliable assessment of morphologic defects in the anal sphincter complex muscles.

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**Abbreviations used in this paper:** [AP](#), anterior-posterior, [EAS](#), external anal sphincter, [FI](#), fecal incontinence, [IAS](#), internal anal sphincter, [PRM](#), puborectalis muscle, [3D](#), 3-dimensional, [2D](#), 2-dimensional, [US](#), ultrasound

## **Physiological, psychological, and behavioural characteristics of men and women with faecal incontinence.**

Maeda Y, Vaizey CJ, Hollington P, Stern J, Kamm MA.

**Colorectal Dis. 2008 Oct 21.** Epub ahead of print

Institution: St Mark's Hospital, London, UK.

**ABSTRACT** Background: The factors leading to faecal incontinence in males are less well understood than those in females. In this prospective study we aimed to compare the physiological, anatomical, psychological, and behavioural characteristics of male and female patients presenting with symptoms of faecal incontinence. Patients and methods: One hundred and nine patients presenting with symptoms of faecal incontinence were studied. They underwent anorectal physiological studies, endoanal ultrasonography, and completed a St Mark's Incontinence Score, a locally developed pad questionnaire, a bowel symptom questionnaire, the Short Form 36 (SF-36) Health Survey questionnaire, the Hospital Anxiety and Depression Scale (HADS) and the Maudsley Obsessive Compulsive Inventory (MOCI). Results: Thirty-four men (mean age 59 years, SD 14 years, range 33-80) and 75 women (mean age 55 years, SD 15 years, range 21-86) participated in the study. Twenty-one patients (38% of men and 11% of women) had normal manometry and endoanal ultrasonography. There was no significant difference in the resting pressures of men compared to women but men had significantly higher squeeze pressures. Rectal capacity was significantly higher in men but anal and rectal electrosensitivities were the same. Men placed a tissue at the anus more commonly than women whilst women were more likely to use a pad and to carry a spare pair of underwear around with them. Psychological profiles were very similar in the two sexes. Conclusions: Nearly 40% of men with faecal incontinence report it in the absence of a definable functional or structural sphincter abnormality. There are differences in physiological characteristics and coping behaviours of men and women with faecal incontinence.

## **Anal sphincter structure and function relationships in aging and fecal incontinence.**

Lewicky-Gaupp C, Hamilton Q, Ashton-Miller J, Huebner M, Delancey JO, Fenner DE.

**Am J Obstet Gynecol. 2009 Jan 9.** [Epub ahead of print]

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**OBJECTIVE:** The objective of the study was to determine the effect of aging and continence status on the structure and function of the external (EAS) and internal (IAS) anal sphincters **STUDY DESIGN:** Young (YC) and older (OC) continent women were compared with older women with fecal incontinence (OI). Patients completed the Fecal Incontinence Quality of Life and Fecal Incontinence Severity Index and underwent anorectal manometry and transanal ultrasound. **RESULTS:** Nine YC, 9 OC, and 8 OI women participated. Aging was associated with a thickening of the IAS. Older incontinent women had a thinner EAS, had decreased maximum squeeze pressures, and were hypersensitive to rectal distention with decreased tolerable rectal volumes and urge to defecate at lower volumes. **CONCLUSION:** Thickening of the IAS occurs with aging. Thinning of the EAS and a corresponding drop in squeeze pressure correlated with fecal incontinence but not aging. Rectal hypersensitivity was associated with fecal incontinence rather than aging and may play a role in the mechanism of fecal incontinence.



## VARIE

### **Anal endosonography is useful for postoperative assessment of anorectal malformations**

*Journal of Pediatric Surgery*, Volume 42, Issue 9, Pages 1549-1554

R. Emblem, L. Mørkrid, K. Bjørnland

#### **Abstract**

##### **Aim**

This study aimed to develop and evaluate a scoring system for anal endosonography to assess anal canal structures after repair of anorectal malformations (ARM).

##### **Methods**

Forty patients with ARM aged 16 years (range, 1-22 years) and 20 controls aged 17 years (range, 0.5-20 years) were examined. Anal function was assessed clinically and by anal canal manometry. The anal canal structures were imaged by anal endosonography using a 7.5-MHz transducer. A scoring system was developed to assess the anal sphincters as visualized on the endosonographic images.

##### **Results**

Continence was significantly correlated to anal canal pressures. The estimated extent of muscle defect (measured in quadrants) and the number of disruptions in the internal and external anal sphincters correlated significantly to the rest and squeeze pressures, respectively. Thus, patients (>4 years) with squeeze pressure of less than 80 cm H<sub>2</sub>O were characterized by more than 1 disruption in the external anal sphincter ring and 2 or more quadrants with scar tissue.

##### **Conclusion**

The extent of scar tissue and the number of disruptions in the anal sphincters correlate with anal canal pressures and continence after ARM repair. Anal endosonography may be used to study the results after different surgical techniques and for prognosis on continence in patients with ARM.

### **Test-retest and intra-observer repeatability of two-, three- and four-dimensional perineal ultrasound of pelvic floor muscle anatomy and function.**

*Int Urogynecol J Pelvic Floor Dysfunct.* 2008; 19(2):227-35 (ISSN: 0937-3462)

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The aims of the present study were to evaluate test-retest intra-observer repeatability of ultrasound measurement of the morphology and function of the pelvic floor muscles (PFMs). Seventeen subjects were tested twice. Two-, three- and four- dimensional ultrasound recorded cough, huff, muscle morphology and PFM contraction, respectively. Analyses were conducted offline. Measurements of levator hiatus dimensions demonstrated intra-class correlation coefficient (ICC) values of 0.61, 0.72, 0.86 and 0.92, for the anterior-posterior dimension, transverse dimension, resting area and narrowing during contraction, respectively. Muscle thickness showed variable reliability. ICC values for measurement of the position of the bladder neck were 0.86 and 0.82 at rest, in the vertical and horizontal direction. Displacement of the bladder neck during contraction, huff and cough demonstrated ICC values of 0.56, 0.59 and 0.51, respectively. Perineal ultrasound is a reliable method for measuring most of the tested parameters of morphology and function of the PFMs.

## NPL ANO

### **Three-dimensional endoluminal ultrasound-guided interstitial brachytherapy in patients with anal cancer.**

**Acta Radiol. 2008; 49(2):132-7 (ISSN: 1600-0455)**

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**BACKGROUND:** New techniques using image guidance other than computed tomography (CT) and traditional two-dimensional (2D) endosonography might improve interstitial brachytherapy in patients with anal cancer. **Purpose:** To investigate a new technique guided by three-dimensional (3D) endosonography used in our institution. **MATERIAL AND METHODS:** Seventeen patients with anal carcinoma were referred to interstitial brachytherapy under 3D endosonographic guidance after external radiotherapy. The procedure was initiated by anal endosonography performed with a 10-MHz rotating endoprobe. Cross-sectional images of the anal sphincters were stored on a 3D system during retraction of the endoprobe through the anal canal. Afterward, any projection could be reconstructed. From this scanning, the optimal positioning of the needles was determined. The needles were inserted through holes in an externally fixated anal template. A repeated endosonography assured that optimal tumor coverage could be obtained by adjusting the number, dwell positions, and/or position of the needles. **RESULTS:** In all patients, endosonography was able to visualize the extension of the tumors and the position of each needle in 3D. **CONCLUSION:** 3D endosonography guidance of interstitial brachytherapy in anal carcinoma seems to optimize the implant procedure and offer better information for dose planning.

## NPL RETTO

### **Preoperative staging of patients with rectal tumors suitable for transanal endoscopic microsurgery (TEM): comparison of endorectal ultrasound and histopathologic findings.**

Zorcolo L, Fantola G, Cabras F, Marongiu L, D'Alia G, Casula G.

**Surg Endosc. 2009 Mar 5.** [Epub ahead of print]

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**BACKGROUND:** Accurate preoperative staging is the key to correct selection of rectal tumors for local excision. This study aims to assess the accuracy of endorectal ultrasound (ERUS) at our institution. **PATIENTS AND METHODS:** Retrospective analysis was carried out of patients treated by transanal endoscopic microsurgery (TEM) from 1996 to 2008. TEM was considered the treatment of choice for uT0-1/N0 lesions located between 2 and 12 cm from the anal verge. It was also proposed in selected uT2-3 patients. Preoperative staging was compared with histopathologic findings. **RESULTS:** Eighty-one patients (46 males, mean age 66 years) underwent TEM. Mean distance of the tumor from the anal verge was 6.6 cm (range 2-12 cm). ERUS staged 15 of 27 adenomas (55%) as uT1. Of 54 carcinomas, 5 were pT0 because TEM was performed to remove resection margins of a malign polyp already snared. Five of 19 pTis (26%) were overstaged uT1, while 7 of 17 pT1 (41%) were understaged. Overall, ERUS enabled distinction between early and advanced rectal lesion with 96% sensitivity and 85% specificity, giving accuracy of 94% (65/67). Thirteen patients had advanced lesions (eight pT2 and five pT3). Only in two of them (15%) was depth of invasion underestimated by ERUS (one uT0, one uT1) and thus was subsequent salvage surgery necessary. **CONCLUSIONS:** ERUS is useful to confirm the diagnosis of adenoma and predict depth of mural invasion in early rectal cancer. Differentiation between T0/is and T1 lesions remains challenging, however this does not usually influence surgical strategy.

## **Role of three-dimensional anorectal ultrasonography in the assessment of rectal cancer after neoadjuvant radiochemotherapy: preliminary results.**

**Surg Endosc.** 2008 Sep 24. [Epub ahead of print]

Murad-Regadas SM, Regadas FS, Rodrigues LV, Barreto RG, Monteiro FC, Landim BB, Holanda EC.

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**BACKGROUND:** Three-dimensional anorectal ultrasound (3-DAUS) scanning provides accurate information on tumor size and its relation to the anal muscles. The purpose of this study was to evaluate the ability of 3-DAUS to assess response to radiochemotherapy (RCT) for rectal cancer by comparing 3-DAUS images to pathological findings. **METHODS:** Twenty-five patients (mean age 52.4 years), staged as T2 (n = 3), T3 (n = 16) or T4 (n = 6), with lymph node metastases in 12 cases, were submitted to neoadjuvant RCT, followed by a second 3-DAUS scan 7 weeks later. The patients were grouped according to the distance (cm) between the distal tumor edge and the proximal border of the internal anal sphincter (IAS) (group I, presenting anal canal invasion; group II,  $\leq 2.0$  cm; group III,  $> 2.0$  cm). All patients were operated on and the pathological findings were compared to post-RCT 3-DAUS scanning results. **RESULTS:** Four (16%) patients (three in group I, one in group II) experienced complete tumor regression. Fourteen (56%) tumors (six in group I, seven in group II, and one in group III) regressed partially. Distance to the IAS was  $> 2.0$  cm in eight patients (seven in group II and one in group III). The remaining six (24%) patients (all group I) experienced no regression. 3-DAUS and pathological findings were concordant in 24 (96%) patients, with only one (4%) nonconclusive post-RCT 3-DAUS result found to be a residual tumor. Tumor regression made sphincter-saving surgery possible in 13 patients (eight in group III, four complete tumor regression, and one nonconclusive on 3-DAUS). Pathological examination revealed free distal margins in all cases. The index of agreement between lymph node metastases on post-RCT 3-DAUS and surgical specimens was moderate (84%). **CONCLUSION:** 3-DAUS can aid significantly in the choice of surgical approach following RCT. However, a greater sample of patients is required to establish sufficiently accurate post-RCT 3-DAUS parameters.

## **Revised morphology and hemodynamics of the anorectal vascular plexus: impact on the course of hemorrhoidal disease.**

**Int J Colorectal Dis.** 2009 Jan;24(1):105-13. Epub 2008 Sep 3

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**PURPOSE:** The pathogenesis of hemorrhoidal disease is based mainly on the vascular hyperplasia theory. The aim of this study was to reassess the morphology and the functional mechanisms of the anorectal vascular plexus with regard to hemorrhoidal disease. **MATERIALS AND METHODS:** The anorectal vascular plexus was investigated in 17 anorectal and five hemorrhoidectomy specimens by means of conventional histology and immunohistochemistry. Vascular corrosion casts from two fresh rectal specimens were used for scanning electron microscopy. Transperineal color Doppler ultrasound (CDUS) with spectral wave analysis (SWA) was performed in 38 patients with hemorrhoidal disease and 20 healthy volunteers. **RESULTS:** The anorectal vascular plexus was characterized by a network of submucosal vessels exhibiting multiple thickened venous vessels separated by distinct sphincter-like constrictions. CDUS and SWA showed significant flow differences in peak velocities (6.8  $\pm$  1.3 cm/s vs. 10.7  $\pm$  1.5 cm/s;  $P = 0.026$ ) and acceleration velocities (51  $\pm$  4 ms vs. 94  $\pm$  11 ms;  $P = 0.001$ ) of afferent vessels between the control group and patients with hemorrhoidal disease. **CONCLUSIONS:** Coordinated filling and drainage of the anorectal vascular plexus is regulated by intrinsic vascular sphincter mechanisms. Both morphological and functional failure of this vascular system may contribute to the development of hemorrhoidal disease.

## ENDOMETRIOSIS

### **Occult perineal endometrioma diagnosed by endoanal ultrasound and treated by excision: a report of 3 cases.**

**J Reprod Med. 2007; 52(8):733-6 (ISSN: 0024-7758)**

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**BACKGROUND:** Isolated perineal endometrioma is a rare entity and often causes diagnostic uncertainty. **CASES:** Three premenopausal women, none with a prior history of endometriosis, presented with vague perineal pain 3-6 months following obstetric delivery with episiotomy. The latency periods between the onset of symptoms and definitive diagnosis were 3 months, 18 months and 3 years despite multiple physician evaluations in the interim. Patient presentation and management were virtually identical in all cases. Detailed questioning revealed that the pain was located adjacent to the episiotomy incision and waxed and waned with menses. Physical examination revealed a vague fullness adjacent to the episiotomy incision. Endoanal ultrasound revealed a mass of mixed echogenicity adjacent to the external anal sphincter. Transperineal exploration revealed a tumor with the gross appearance of an endometrioma, which was confirmed histologically. Excision of the mass with preservation of the anal sphincter muscle resulted in resolution of symptoms in all patients without the need for hormonal manipulation. No patient suffered diminution of fecal continence. **CONCLUSION:** Occult perineal endometriosis should be considered when a woman presents with cyclic pain in the perineum following delivery and episiotomy. Endoanal ultrasound can assist with the diagnosis. Transperineal excision with sparing of the anal sphincter can be curative, without compromising continence.

## ODS

### **Defecation proctography and translabial ultrasound in the investigation of defecatory disorders.**

**Ultrasound Obstet Gynecol. 2008; 31(5):567-71 (ISSN: 1469-0705)**

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**OBJECTIVES:** Defecation proctography is the standard method used in the investigation of obstructed defecation. Translabial ultrasound has recently been shown to demonstrate rectocele, enterocele and rectal intussusception. We performed a comparative clinical study to determine agreement between the two methods. **METHODS:** Thirty-seven women scheduled to undergo defecation proctography for obstructed defecation were recruited. Using both proctography and translabial ultrasound, we determined the anorectal angle, presence of a rectocele and rectocele depth, rectal intussusception and prolapse. Measurements were obtained by operators blinded to all other data. All patients rated discomfort on a scale of 0-10. **RESULTS:** Six women did not attend defecation proctography, leaving 31 cases for comparison. The mean age was 53 years. Patients rated discomfort at a median of 1 (range 0-10) for ultrasound and 7 (range 0-10) for defecation proctography ( $P < 0.001$ ). Defecation proctography suggested rectocele and rectal intussusception/prolapse more frequently than did ultrasound. While the positive predictive value of ultrasound (considering defecation proctography to be the definitive test) was 0.82 for rectocele and 0.88 for intussusception/prolapse, negative predictive values were only 0.43 and 0.27, respectively. Cohen's kappa values were 0.26 and 0.09, respectively. There was poor agreement between ultrasound and defecation proctography measurements of anorectal angle and rectocele depth. **CONCLUSIONS:** Translabial ultrasound can be used in the initial investigation of defecatory disorders. It is better tolerated than defecation proctography and also yields information on the lower urinary tract, pelvic organ prolapse and levator ani. Agreement between ultrasound and defecation proctography in the measurement of quantitative parameters was poor, but when intussusception or rectocele was diagnosed on ultrasound these results were highly predictive of findings on defecation proctography.

## **A comparison of dynamic transperineal ultrasound (DTP-US) with dynamic evacuation proctography (DEP) in the diagnosis of cul de sac hernia (enterocele) in patients with evacuatory dysfunction.**

**Int J Colorectal Dis. 2008; 23(5):513-9 (ISSN: 0179-1958)**

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**BACKGROUND/AIMS:** Cul-de-sac hernias (enterocele and peritoneocele) are difficult to diagnose in patients presenting with primary evacuatory difficulty. Failure to recognize their presence in patients undergoing surgery may lead to poor functional outcome. Accurate diagnosis requires specialized investigation including dynamic evacuation proctography (DEP) or dynamic magnetic resonance (MR) imaging. Recently, dynamic transperineal ultrasonography (DTP-US) has been used for this purpose. This study compares DEP with DTP-US for the diagnosis of cul-de-sac hernias in those patients presenting with evacuatory dysfunction. **MATERIALS AND METHODS:** Sixty-two female patients with chronically obstructed defecation underwent blinded clinical, DEP, and DTP-US assessment to define the accuracy of diagnosis of cul-de-sac hernias. **RESULTS:** Both the DEP and the DTP-US techniques show concordance for the diagnosis of cul-de-sac hernias in an unselected patient cohort. Patients in both groups have the same duration of constipation with a greater likelihood of prior hysterectomy in those with cul-de-sac hernias. The diagnosis was established separately by DEP in 88% and in 82% of the cases by DTP-US. Transperineal sonography is discordant with DEP in 45% of cases once the diagnosis of cul-de-sac hernia is made, over the contents of the hernia and over the degree of transvaginal enterocele descent, where DTP-US tends to upgrade enterocele severity. Both techniques confirm the high incidence of concomitant pelvic floor compartment pathology. **CONCLUSIONS:** Both methods have accuracy for the diagnosis of cul-de-sac hernias in those patients presenting with evacuatory difficulty. Transperineal sonography tends to more readily diagnose peritoneocele and to upgrade enterocele extent. As an office procedure, it is a valuable adjunct to the clinical examination in the diagnosis of cul-de-sac hernia

## **FISTOLA**

### **Perianal fistulas: developments in the classification and diagnostic techniques, and a new treatment strategy**

[Article in Dutch]

Van Koperen PJ, Horsthuis K, Bemelman WA, Stoker J, Slors JF.

**Ned Tijdschr Geneeskd. 2008 Dec 20;152(51-52):2774-80.**

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The aim of surgical treatment of perianal fistulas is to treat the patient's symptoms, with low recurrence rates and risk of incontinence. In recent years there have been developments regarding the classification and diagnosis of perianal fistulas. MRI is the most appropriate diagnostic tool. In the hands of an experienced operator anal endosonography is a suitable, less expensive and readily-available alternative. As a result of developments in fistula surgery it is now more practical to classify perianal fistulas as low or high fistulas, as this has implications for the further treatment. Low perianal fistulas are defined as fistulas of which the fistula tract is located in the lower third of the external anal sphincter. High fistulas are fistulas in which the fistula tract runs through the upper two-thirds of the external sphincter muscle. Low perianal fistulas can be treated safely by fistulotomy. At present, rectal advancement is the gold standard for the surgical treatment of high transsphincteric perianal fistulas. The anal fistula plug might be an alternative for the treatment of high transsphincteric perianal fistulas.