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Original Article

Correlation of anorectal electromanometry and anorectal three-dimensional ultrasound findings in patients with fecal incontinence



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ABSTRACT

Objective: To show the correlation of anorectal electromanometry and three-dimensional anorectal ultrasonography in patients with fecal incontinence.

Method: Prospective study involving 34 women (mean age: 55 years) with a diagnosis of fecal incontinence. The samples were submitted to three-dimensional anorectal ultrasonography/Echodefecography and anorectal electromanometry.

Results: Based on anorectal electromanometry data, 70.5% of 34 patients had hypotonia at rest, 64.7% had hypotonic contraction, 52.9% had both hypotonia at rest and hypotonic contraction, and 44.1% had anismus. By three-dimensional anorectal ultrasonography, 32.3% had internal anal sphincter injury, 79.4% had external anal sphincter injuries, and 26.4% had both internal and external anal sphincter injuries. In 38.2%, anismus was suggested and 50% showed rectocele. Overall, only 5.8% had normal results for anorectal electromanometry combined with three-dimensional anorectal ultrasonography. Kappa index was 0.297 and the presence of anismus through anorectal electromanometry and three-dimensional anorectal ultrasonography was compared by Student's t test application, with $p < 0.0001$.

Conclusion: We conclude that there was a reasonable agreement in the comparison of sphincter hypotonia by anorectal manometry and sphincter injury by anorectal three-dimensional ultrasonography in a group of patients with fecal incontinence. The incidence of anismus in patients with fecal incontinence is considerable, and the therapeutic approach in these patients should be modified.

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Correlação dos achados da Eletromanometria anorretal e Ultrassonografia anorretal tridimensional nos pacientes portadores de incontinência fecal

R E S U M O

Palavras-chave:

Incontinência
Manometria anal
Ultrassom 3D
Anismus
Contração hipotônica
Hipotonia em repouso
Lesão esfínctérica

Objetivo: Demonstrar a correlação entre eletromanometria anorretal (EMAR) e ultrassonografia tridimensional anorretal (3D-US) em pacientes com incontinência fecal.

Método: Estudo prospectivo envolvendo 34 mulheres (média de idade: 55 anos) com diagnóstico de incontinência fecal. As amostras foram submetidas à 3D-US/Ecodefecografia e EMAR.

Resultados: Com base nos dados de EMAR, 70,5% das 34 pacientes exibiam hipotonia em repouso, 64,7% exibiam contração hipotônica, 52,9% hipotonia em repouso e contração hipotônica, e 44,1% exibiam anismus. Com base nos achados de 3D-US, 32,3% exibiam lesão no esfíncter anal interno, 79,4% exibiam lesão no esfíncter anal externo, e 26,4% em ambos os esfíncteres anais interno e externo. Pela 3D-US, em 38,2% das pacientes houve indício de anismus, e em 50%, retocele. No total, apenas 5,8% obtiveram resultados normais combinados para EMAR e 3D-US. Foi constatado um índice Kappa = 0,297 e, no teste t de Student, a comparação de anismus por EMAR e por 3D-US obteve significância de $p < 0,0001$.

Conclusão: Concluímos ter havido concordância razoável ao ser comparada a manometria anorretal para hipotonia esfínctérica e a ultrassonografia tridimensional anorretal para lesão esfínctérica em um grupo de pacientes com incontinência fecal. A incidência de anismus em pacientes com incontinência fecal é considerável, e a abordagem terapêutica para esses pacientes deve ser modificada.

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Introduction

Fecal incontinence (FI) is a condition that precludes the voluntary control of the elimination of gases and feces, being more prevalent in women than in men.¹ Anal continence depends on multiple factors, such as mental function, volume and consistency of stools, colonic transit, rectal distensibility, sphincter function, sensitivity and anorectal reflexes.² Thus, any change in one of these elements can lead to incontinence.

Anorectal electromanometry (AREM) and ultrasonography (US) are useful tests in the evaluation and investigation of FI. Other tests, not widely available, and recommended in selected patients, include defecography, pudendal nerve latency test, and nuclear magnetic resonance.³⁻⁵

AREM is the test for physiological evaluation more widely used in the study of fecal incontinence; it allows the measurement of pressures at rest and contraction pressures, as well as the size of the functional anal canal, capacity, compliance, and rectoanal inhibitory reflex survey. AREM also allows an understanding of the synchronization of sensory and motor components of the anal canal.^{3,6}

Anorectal US is characterized by its usefulness for the anatomic identification of sphincteric muscles: internal anal sphincter (IAS), external anal sphincter (EAS) and puborectalis muscle, as well as perianorectal tissue.⁷⁻⁹ Currently, a new type of anorectal US provided with a three-dimensional transducer (3D) is available. This technology creates a hub with a string of widely mobile axial images.¹⁰⁻¹² Thus, 3D-US produces a high-quality anatomical image of the anal canal and sphincter complex.¹³ Studies comparing the accuracy of two- and three-dimensional endo-anal US versus MRI with

an endo-rectal coil in the measurement of muscle thickness found the same results.^{14,15}

The aim of this study is to correlate the findings of anorectal electromanometry and of three-dimensional anorectal ultrasonography in patients with fecal incontinence.

Method

This is a prospective study of 34 women diagnosed with fecal incontinence. These patients underwent AREM and 3D-US in the period from March 20, 2011 to December 15, 2011. The study was conducted at Gastroclínica Cascavel/PR, and the patients were submitted to AREM and 3D-US & ECD by two coloproctologists (GK & DMRL).

AREM was carried out with the women in left lateral decubitus with their legs flexed at 90°, with no bowel preparation. The device used had an 8-channel system of water for infusion (Dynapack MPX 816, Dynamed). Each patient had a 5-min period for her adaptation to the probe, and also for obtaining stable baseline recordings, before the measurements subsequently obtained. With the use of AREM, one can evaluate the pressure at rest (normal 40–70 mmHg), the contraction pressure (normal 100–200 mmHg), and the movement of sphincter muscles before straining (relaxation: normal; non-relaxation: suggests occurrence of anismus).

A solution with Phosphoenema® was applied two hours before 3D-US & ECD procedures; the patients were positioned in left lateral decubitus with their legs flexed at 90°. The equipment used was a B & K Medical® machine with a 360° rotational transducer type 2050 with a frequency of 10–16 MHz; the device performs an automatic scanning in the

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