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214

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Title (type in
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LETTERS)

DIAGNOSING THE DEFECTS OF THE ANAL SPHINCTER MUSCLE

A COMPARISON OF ANAL ENDOSONOGRAPHY AND MANOMETRY

Aims of Study

Endo-anal sonography, like rectal manometry and the electro-physiological methods MRT or CT, is a way of displaying the anal sphincter muscle complex. However, the effectiveness of these various methods remains a matter of great controversy. Thus, Sultan et al. find no correlation at all between sphincter thickness and the resting or maximum pressure in manometry (1). Londono et al. also note the absence of any relationship between the results of sonography and manometry (2).

Endo-anal sonography is a non-invasive method of displaying anal sphincter defects and is also the simplest technique to integrate into routine diagnosis.

Null hypothesis: Sonomorphology and sonomorphometry show a correlation with the values of sphincter manometry in the case of intact and defective anal sphincter muscle.

Materials and Methods

Twenty women (46.7±18 years) were examined by means of endo-anal sonography and manometry. Seven women who had no clinical symptoms and showed no pathological findings via sonography were examined in group I (35%). Thirteen women with clinical symptoms – (38.4% stool incontinence, 76.9% flatus incontinence, 46.1% urgency stools) and pathological findings (defect of the external anal sphincter muscle in 43% and of the internal muscle in 96%) were examined in group II (65%) via manometry.

Anal manometry

With the subjects in the left lateral position, anal manometry was performed using a low-compliance open-ended perfused polyvinyl catheter connected to a pressure transducer with six channels. The catheter was introduced into the rectum (15-20 cm) and then gradually withdrawn until the pressure zone of the anal canal was identified, using a stationary pull-through technique. The maximum resting pressure and the maximum squeeze pressure were measured. The sensitivity and capacity of the rectal ampulla were examined by filling the balloon at the end of the catheter with air. The volume corresponding to the first sensation indicated the sensitivity while the capacity was measured as the maximum tolerated volume.

Anal endosonography

For the endo-anal sonography of the sphincter, use was made of a high-frequency transducer (7MHz) for detailed resolution, near-field focusing and an axial 360° image for viewing the circular sphincter structures. Views of the canal at high, mid and low levels were taken. Sphincter defects appeared as a discontinuity in the normal texture of the muscle ring. An external sphincter defect appeared as a disruption of the muscular ring relative to the mixed echo of the muscle, while an internal sphincter defect manifested as an interruption of the homogeneous muscle ring.

Statistics

Student's t-test was used as the statistical method. Differences in mean values were considered significant at $p < 0.05$.

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Results

Women (n=20)	Resting pressure	Maximum pressure	Sensitivity	Capacity
Group I (n=7)	51.4 (\pm 14.6)	139.5 (\pm 38.0)	18.5 (\pm 2.1)	124.7 (\pm 20.3)
Group II (n=13)	22.9 (\pm 7.8)	64.5 (\pm 30.1)	61.5 (\pm 53.2)	225.4 (\pm 70.2)
p values	0.014	0.048	0.031	0.035

The average thickness of the external anal sphincter muscle was 8 (\pm 1.78 mm), and that of the internal anal sphincter muscle was 2.5 (\pm 0.5 mm). No correlation was observed ($r=0.24$) between the defects determined by sonography and the muscle thickness. The anorectal inhibition reflex was observed in only one patient in group I and in three patients in group II.

Conclusions

Significantly different manometry findings between both examined groups showed the high sensitivity of endoanal sonography for identifying morpho-functional defects of the anal sphincter muscle. We explain the very high values of sensitivity and capacity in the cases of urgency stools in group II by assuming the presence of an additional neurological defect.

In contrast, the thickness measurement of the external and internal anal sphincter muscles allows no conclusions to be drawn as to their function.

In the presence of symptoms, endo-anal sonography can identify a morphological defect. In addition to the diagnosis of defects of the anal sphincter muscles, endo-anal sonography should also be used to identify the aims of treatment.

- 1) Int J Colorect Dis (1994) 9:110-113
- 2) Clinical Radiology (1994) 49:368-374