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CORRELATION BETWEEN THREE DIMENSIONAL TRANSLABIAL PELVIC FLOOR ULTRASONOGRAPHY AND ANAL MANOMETRY IN FEMALE PATIENTS WITH FAECAL INCONTINENCE

Hypothesis / aims of study

Extensive damage of the pelvic floor due to childbirth can lead to anatomical abnormalities such as levator defects and or anal sphincter injuries and can lead to devastating conditions as faecal incontinence. Anal manometry has been developed for assessment of anal sphincter function in patients with faecal incontinence. 3D/4D Translabial ultrasound can be used for evaluating the anal sphincter complex as well for detecting abnormalities of the levator ani complex and is less invasive than endoanal ultrasound. The aim of this study is to find a correlation between anal sphincter defects, levator ani abnormalities and endo-anal manometry measurements in patients complaining of faecal incontinence.

Study design, materials and methods

In a prospective observational study 103 patients referred to a tertiary pelvic floor clinic with faecal incontinence were evaluated. All patients underwent a standardized interview, clinical examination, anal manometry and a 3D/4D translabial ultrasound. Anal Manometry measurements was performed according to the standard hospital protocol. Measurements included the mean maximum resting pressure, mean maximum squeeze pressure and compliance of the anal canal.

The translabial ultrasound was performed in supine position and after voiding using GE Kretz Voluson 730 Expert system and a RAB 4-8 MHZ probe. 3D/4D Volumes were obtained at rest, on pelvic floor contraction and on Valsalva manoeuvre. Off-line analysis was performed with 4D View software with the investigator blinded for the clinical data. For quantification of the levator defects a Tomographic Ultrasound Imaging (TUI) was used in volumes obtained at maximal pelvic floor contraction. Levator defects are defined as an interruption of the levator ani muscle with the pelvic side wall. At the level of minimal hiatal dimension a set of 8 slices with interval of 2.5 mm, and defects were scored 0-8 for each side (max 16). A TUI score for each side of more then 3 was considered to be a major clinical relevant defect. For imaging of the anal sphincter complex a 3D micro convex transducer (RNA 5-9 MHz) was used. VCI static technique was used with a slice thickness of 2 mm for assessment of the anal sphincter complex. Measurements were taken for the length of the superficial external sphincter (EAS) and the total length of the anal sphincter complex (TLAS) in the axial plane and in the sagittal plane the thickness of the internal sphincter (IAS), and the external sphincter at 9 and 12 o'clock.

Figure 1. translabial ultrasound of the anal sphincter using the VCI-static technique in a patient with a IAS and EAS defect

Results

Complete datasets were available for 93 patients. The mean age was 53 years, ranging from 28 to 75 years. All patients had faecal incontinence, 46,2 % also were complaining of urinary incontinence. 25 Patients were diagnosed with an anal sphincter injury (26.9%), which involved either the internal sphincter defect, external or both. The mean resting sphincter pressure was significant lower in the patients diagnosed with an anal sphincter defect ($P < 0.05$), but not for the mean maximum squeeze pressure. 44 Patients were diagnosed with a levator defect (47,3%), with 28 patients having a right-sided defect (30.1%) and 31 patients a defect on the left side (33,3%). There were significant more levator defects on the right than the left side in patients diagnosed with an anal sphincter defect ($P < 0.05$). No significant differences were found between anal manometry and levator defects on the right, left or both. For all measurements of the anal sphincter complex we did not found any significant differences for patients with of without defects.

Interpretation of results.

Faecal incontinence is a devastating complaint and multiple factors contribute to the diagnosis of faecal incontinence. The internal anal sphincter is responsible for approximately 85% of maximum resting pressure and the external anal sphincter is responsible for rest. The striated external anal sphincter muscle is largely responsible for the increase in sphincter pressure during contraction but little is known about the contribution and or defects of the levator ani complex for increasing pressure and maintaining faecal continence. It is of clinical importance for the treatment of faecal incontinence to assess anal function and anatomy. Sphincter defects can cause lower sphincter pressure. This study showed that in only 27% of the patients complaining of faecal incontinence anal sphincter defects were diagnosed. The patients with defects had significantly lower mean resting pressure and had also significant more levator defects on the right. No significant difference was found for other measurements of the anal sphincter complex. The high incidence of 47,3% of levator defects in this study could suggest that also levator defects contribute to the diagnosis of faecal incontinence.

Conclusion

Multiple factors contribute to the diagnosis of faecal incontinence. Anal sphincter injury (IAS, EAS of both) was diagnosed in 27% of the patients anal sphincter defects but in 47% a major defect of the levator ani complex was detected. Anal sphincter defects were significant related with lower resting pressure and defects on the right side. No other measurements of the anal complex were statistically significant.

References

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What were the subjects in the study?	**HUMAN**
Was this study approved by an ethics committee?	**No**
This study did not require eithics committee approval because	**It was a prospective observational study.**
Was the Declaration of Helsinki followed?	**Yes**
Was informed consent obtained from the patients?	**Yes**