

## Comparison of vector symmetry index and endoanal ultrasonography in the diagnosis of anal sphincter disruption

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**Abstract Background** Anal pressure vectography is an anorectal physiology study that evaluates the radial pressures in the anal canal from which a symmetry index that indicates the anatomical integrity of the anal sphincter can be calculated. However, there are conflicting opinions of its validity. Since endoanal ultrasonography (EAUS) has been recognized as the gold standard for detecting anal sphincter disruption, the aim of this pilot study was to observe whether a vector symmetry index (VSI) determined at the level of injury shown in EAUS has a better sensitivity than the overall VSI in detecting anal sphincter disruption. **Methods** A group of 11 women in whom

EAUS had shown defects in both the internal and the external anal sphincters underwent anorectal manometry using a water-perfused vector manometry catheter, and the overall VSI and the VSI at the level of sphincter disruption (shown on EAUS) were calculated. **Results** Overall VSI at rest indicated internal sphincter injury in 7 women (64%) but the VSI at the level of disruption indicated internal sphincter injury in all 11 women (100%,  $p=0.0137$ ). Similarly, the overall VSI at squeeze indicated external sphincter injury in 6 women (55%), but the VSI at the level of disruption indicated external sphincter injury in 10 women (91%,  $p=0.0049$ ). **Conclusions** Our pilot study showed that EAUS and VSI are equally sensitive in diagnosing a localized anal sphincter defect, provided a segment-for-segment comparison is carried out.

**Key words** Anal sphincter injury • Endoanal ultrasonography • Vector symmetry index

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### Introduction

Injuries to the anal sphincter may be segmental or generalized and therefore anorectal physiology studies that measure the net sphincter pressure cannot distinguish between these two conditions. In 1987, Collier [1] demonstrated that reduction in the pressure can occur only in the traumatized segment and not in the entire muscle. This led to the development of computer software by Perry et al. [2] which allowed the computer to construct a three-dimensional anal pressure profile (vectorgram) from the manometry data (Fig. 1). This profile also allowed the vectorgram to be moved on the screen in all directions, and also a transverse section of the