Role of MRI in Evaluation of Pelvic Floor Dysfunction in Females

Essay

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ABSTRACT

MRI plays an important role in assessment of pelvic floor dysfunction in females. it is non-invasive, simple and does not expose the patient to ionizing radiation, MRI is the best imaging study available to evaluate pelvic floor dysfunction and differentiate between cystocele, enterocele, rectocele, vault and uterine prolapse. MRI also provides a multiplanar thorough evaluation of the pelvic contents. Upright dynamic MRI in an open configuration magnetic resonance system or even three-dimensional reconstruction for virtual reality of the urinary tract and pelvic floor might be used for evaluation of pelvic floor dysfunction. Endocavitary MRI allows multiplanar depiction and high resolution.

Key words: Pelvic floor anatomy –Pelvic floor pathophysiology- MRI.

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List of Abbreviations

ARA	Anorectal angle
ARJ	Anorectal junction
CT	Computed tomography
ES	External sphincter
FOV	Field of view
FSE	Fast spin echo
GSI	Genuine stress incontinence
HASTE	Half-acquisition single-shot turbo spin echo
IS	Internal sphincter
LAM	Levator ani muscle
MR	Magnetic Resonance
MRI	Magnetic Resonance Imaging
PCL	Pubococcygeal line
PFM	Pelvic floor muscles
POP	Pelvic organ prolapse
SSFSE	Single-shot fast spin echo
TE	Echo Time
TR	Repetition Time
UI	Urinary incontinence
UL	Urethral length
US	Ultrasonography
VCUG	Voiding Cystourethrography
3D	Three-dimensional

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Introduction & Aim of the work

Introduction

The pelvic floor is a complex system, with passive and active components that provide pelvic support, maintain continence, and coordinate relaxation during urination and defecation *(Stocker et al, 2007).*

The pelvic floor muscles (PFM) form the floor of the pelvic basin and help maintain continence by actively supporting the pelvic organs and closing the pelvic openings with their anterior and cephalad action when contracting. The PFM comprise the pelvic diaphragm muscles (pubococcygeus, puborectalis, and iliococcygeus, together known as the levator ani), which can be referred to as the deep layer of the PFM; the urogenital diaphragm muscles (ischiocavernosus, bulbocavernosus, and transversus perinei superficialis, together known as the perineal muscles), which can be referred to as the superficial layer of the PFM; and the urethral and anal sphincter muscles *(Kari and Margaret, 2005).*

Functional disorders of the pelvic floor are a common clinical problem; the diagnosis and treatment of these disorders which frequently manifest with nonspecific symptoms such as constipation, incontinence, or pain are difficult *(Lienemann and Fischer, 2003)*

Imaging techniques have increasingly applied to the investigation of female pelvic organ prolapse. Such prolapse may manifest in the anterior pelvic compartment (cystocele with or without urethrocele), middle pelvic compartment (vaginal vault prolapse), or posterior pelvic compartment (rectocele, sigmoidocele**)** *(Kelvin et al, 2000).*

The advent of high-quality surface coils and rapid T2-weighted imaging techniques has made magnetic resonance (MR) imaging a compelling competitor to voiding cystourethrography, ultrasonography, and defecography for the evaluation of these women *(Fielding, 2002).*

Dynamic MR defecography has been shown to aid in detection of functional and morphological abnormalities of the anorectal region *(Pannu, 2007).*

MR defecography with an open-configuration magnet enables accurate assessment of the anorectal morphologic structures and of function in relation to the surrounding structures without exposure of the patient to harmful ionizing radiation *(Bertschinger et al, 2002).*

Endoanal magnetic resonance (MR) provides multiplanar imaging capability and high spatial resolution for demonstration of anal anatomy with a fine delineation of all sphincter muscles, this led to recent revision of the knowledge of anal sphincter anatomy, especially when dealing with sphincter atrophy as a cause of fecal incontinence in the elderly women *(Mauben et al, 2003).*

Endoanal MRI is predominantly useful in determining external anal sphincter thickness and structure and can evaluate the presence of external anal sphincter defects, atrophy, and thickness *(Dobben et al, 2007).*

Aim of the work

The purpose of this review is to describe the role of magnetic resonance imaging (MRI) in the diagnosis of pelvic floor dysfunction in female patients.

Gross Anatomy