

THE VALUE OF EXPRESS T2-WEIGHTED PELVIC MRI IN THE PREOPERATIVE EVALUATION OF SEVERE PELVIC FLOOR PROLAPSE: A PROSPECTIVE STUDY

Aims of Study

Severe pelvic floor prolapse (PFP) represents a significant diagnostic and reconstructive challenge for clinicians. Preoperative evaluation including physical examination and videourodynamics may not necessarily unravel the presence of the an enterocele. For example, when encountered unexpectedly at the time of vaginal exploration, the presence of an enterocele may add to the complexity, and time commitment, of the repair. Previous studies have demonstrated the value of HASTE (half-Fourier acquisition single-shot turbo-spin echo) magnetic resonance imaging (MRI) in the evaluation of female PFP.¹ EXPRESS (extended phase conjugate symmetry rapid spin echo sequence) has not been prospectively studied in the evaluation of PFP. Due to extremely short scan time, EXPRESS MRI sequences are ideal for rapid dynamic scanning during breath holding. Herein, we report our prospective experience with EXPRESS MRI of the female pelvis in the pre-operative staging of severe PFP.

Methods

Between 1/1999-12/2001, 31 consecutive female patients with severe (grade 4/4) PFP (cystourethrocele, uterine prolapse, vaginal cuff prolapse, enterocele, and/or rectocele) were referred to our institution. Of these, 26% had prior lower urinary tract reconstruction, which failed. Of these 31 patients, 20 (65%) underwent EXPRESS sequence dynamic pelvic MRI in 1.5 Tesla magnet (Picker) with phased array coils. Mid-sagittal and parasagittal cuts (relaxed and straining) were obtained in the supine position without any peri-procedural instrumentation. The entire pelvis was rapidly scanned in 3 minutes. The remaining 11 patients were not scanned, due to stated claustrophobia (3), patient refusal (3), financial reasons (2), the presence of orthopedic hardware (2) or of a previously implanted cardiac pacemaker (1). An experienced pelvic floor reconstruction surgeon recorded pre-operative pelvic examination and operative findings. PFP was graded (grade 0-4) for each compartment (0-no prolapse/ 4-severe prolapse). Patients having MRI were scanned in the supine position, and graded numerically while straining: 0-no prolapse below the pubosacral line; 1-prolapse less than halfway; 2-prolapse halfway; 3-prolapse more than halfway; and, 4-prolapse through the whole vaginal canal.^{1,2} The radiologist reading the MRI scans was blinded from any clinical data. The data for initial examination, preoperative MRI, and operative findings were tabulated, and were analyzed with SPSS 10.0 statistical software. Pearson's correlations of paired-samples was utilized to test differences between initial examination, MRI, and operative findings.

Results

Of the 20 patients having preoperative MRI, mean age was 67 years (range 34-91 years). Mean duration of prolapse was 6.1 years (range 0.5-26 years). Mean MRI room time was 20 minutes. Resultant images were of excellent quality, and clearly displayed pelvic anatomy. All patients were operated upon for symptomatic PFP with or without associated voiding dysfunction. 19 had vaginal repair, and one had abdominal sacrocolpopexy. 4/9 (44%) of women without prior hysterectomy had concomitant vaginal hysterectomy. There were no post-operative complications or recurrent PFP at a median follow up of 19 months. Pearson's correlation of paired samples compared the operative findings with the preoperative pelvic examination, and with the preoperative MRI. Significant correlations found between preoperative pelvic examination and operative findings were: cystourethrocele, $r=0.61$, $p=0.005$; and vaginal cuff prolapse, $r=0.75$, $p=0.008$. Significant correlations found between MRI and operative findings were: enterocele, $r=0.78$, $p<0.001$; cystourethrocele, $r=0.68$, $p=0.001$; vaginal cuff prolapse, $r=0.75$, $p=0.008$; and, uterine prolapse, $r=0.78$, $p=0.014$. Interestingly, preoperative pelvic examination did not correlate with operative findings of uterine prolapse, enterocele, or rectocele, whereas MRI did not correlate with operative finding of rectocele.

Conclusions

EXPRESS MRI provided superb dynamic imaging of the entire female pelvis in 3 minutes scan time. In severe pelvic floor prolapse, preoperative pelvic examination correlated significantly with operative findings of cystourethrocele and vaginal cuff prolapse, but not with uterine prolapse, enterocele or rectocele. MRI correlated significantly with operative findings of enterocele, cystourethrocele, vaginal cuff prolapse and uterine prolapse, but not with rectocele. Consistent with previous studies, we found MRI to be a valuable adjunct in detecting enteroceles preoperatively. Of particular interest was that MRI more accurately detected

enteroceles than did physical examination. Clinical uncertainty regarding the components of pelvic floor prolapse is increased by the severity of the process, especially since there is space competition by the various components, which can result in under-diagnosis of enteroceles. Clinicians should consider obtaining dynamic, rapid-sequence sagittal pelvic MRI imaging in cases of severe pelvic floor prolapse. More accurate preoperative information may ultimately result in improved long-term surgical outcomes.

References:

1. Dynamic half Fourier acquisition, single shot turbo spin-echo magnetic resonance imaging for evaluating the female pelvis. *J Urol* 2000; 164(5): 1606-13.
2. Grading pelvic floor prolapse and pelvic floor relaxation using dynamic magnetic resonance imaging. *Urology* 1999; 54(3): 454-7.