3

Dietz H P[1], Lekskulchai O[2]
1. University of Sydney, 2. Thammasat University, Bangkok, Thailand

DOES DELAYED CHILDBEARING INCREASE THE RISK OF LEVATOR INJURY IN LABOUR?

Hypothesis / aims of study

Major morphological abnormalities of the levator ani muscle are not uncommon in women presenting with symptoms of urinary incontinence and prolapse and can be detected on magnetic resonance (MR) and 3D ultrasound imaging[1, 2]. They are also palpable on vaginal examination, although specific training is required to detect such trauma. Levator defects are associated with vaginal childbirth[1,3] and may be more common in women who are older at the time of their first vaginal delivery[3]. We therefore conducted a prospective study correlating the age at first vaginal birth against the incidence of unilateral and bilateral trauma to the pubovisceral muscle as defined on 3D pelvic floor ultrasound.

Study design, materials and methods

490 women were seen over the course of two years at a tertiary urogynaecological unit for symptoms of urinary incontinence, pelvic organ prolapse and recurrent urinary tract infections. They were examined clinically for prolapse (ICS POPO-Q grading) and levator integrity and function (modified Oxford Grading) and had full multichannel urodynamics testing using a fluid- filled system (Neomedix, Sydney, Australia). About half (n= 248) also underwent 3D/ 4D pelvic floor ultrasound, supine and after bladder emptying. 3D/ 4D capable ultrasound systems (Medison SA 8000 and GE Kretz Voluson 730 expert) were utilized to acquire volume imaging data at rest, on maximal Valsalva (best of at least three attempts) and on maximal pelvic floor contraction. Whenever there was a discrepancy between ultrasound and palpation, findings were reviewed until an unequivocal decision could be reached. The figure illustrates findings after unilateral avulsion injury of the pubovisceral muscle.

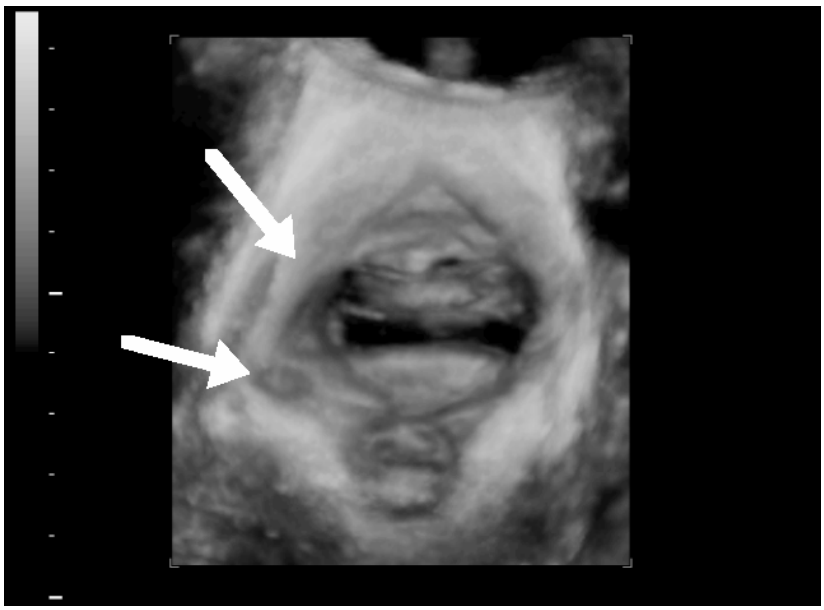

Figure: Unilateral right-sided avulsion injury of the pubovisceral muscle in 52 year old patient with 2nd degree cystocele and uterine prolapse (rendered volume, axial plane, caudocranial direction, 80/20 mix of surface rendering and transparency mode).

Results

Of 490 patients, 480 could be examined for defects. Two were virginal, seven could not be assessed due to vaginal stenosis or atrophy, and in one case the examination was omitted for unknown reasons. Avulsion injuries were detected in 104 women (24.1% of parous women). Mean age was 55.6 years (range 17-90), with 387 (79%) complaining of stress urinary incontinence, and 106 (22.5%) of symptoms of prolapse. Mean vaginal parity was 2.6 (range 0-12), and mean age at first vaginal delivery was 24 (range 14-38). 49 were nulliparous or had only delivered by Caesarean Section. Defects were found only in vaginally parous women. They were unilateral on the right in 59, unilateral on the left in 18, and bilateral in 27 women which implies a higher likelihood of trauma on the right ($P< 0.001$). There was a significant association with maternal age ($P=0.004$), with patients showing defects having delivered their first child on average 1.6 years later than those without. There was no association between defects and urodynamics findings except for the diagnosis of voiding dysfunction (residual >= 100 ml and/ or maximum flow rate centile below 5, $P= 0.003$ on Fisher's exact test), or between bladder symptoms and levator defects, but women with defects were more likely to complain of symptoms of prolapse ($P= 0.009$), and they showed higher grades of anterior and central compartment prolapse, both clinically (Cystocele and uterine prolapse, $P< 0.001$) and on ultrasound (Cystocele, $P< 0.001$, uterine prolapse, $P= 0.01$).

Interpretation of results

Defects of the pubovisceral muscle are common and seem to occur more often on the right. They seem to be associated with symptoms of prolapse, clinical and ultrasound measures of prolapse, and urodynamically diagnosed voiding dysfunction, but no other symptoms or signs of bladder dysfunction. We have recently been able to show that increased maternal age may be a risk factor for intrapartum pelvic floor trauma[3] in women delivering today. This has recently been confirmed in another imaging study using magnetic resonance, and there is some epidemiological support for this hypothesis. The patients examined for this study had been much younger on average when they delivered their first child (24.0 vs. 31.6 years in [3]), but we again found a relationship, albeit weaker, between maternal age at first vaginal delivery and levator trauma.

Concluding message

Major morphological abnormalities of the levator ani muscle seem associated with age at first vaginal delivery. The current worldwide trend towards delayed childbearing may well result in an increased prevalence of related disorders, in particular pelvic organ prolapse, in coming decades.

References

1. Obstet Gynecol, 2003. **101**(1): p. 46-53.
2. Br J Obstet Gynaecol, 2005. **113**: p. 1-5.
3. Obstet Gynecol, 2005. **106**: p. 707-712.

FUNDING: Betty Byrne Henderson Foundation, University of Queensland
DISCLOSURES: NONE
HUMAN SUBJECTS: This study was approved by the Wentworth Area Human Research Ethics Committee and followed the Declaration of Helsinki Informed consent was not obtained from the patients.