Symptoms of female pelvic organ prolapse: Correlation with organ descent in women with single compartment prolapse

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Background: Female pelvic organ prolapse is a common condition that often leads to surgical intervention to alleviate symptoms. The relationship between symptoms of prolapse and pelvic organ descent however, remains unclear.

Aim: To determine the correlation between the symptom of a vaginal lump and objective measures of female pelvic organ descent.

Methods: Women seen at a tertiary urogynaecological unit were assessed using an interview, clinical examination, multichannel urodynamics and ultrasound imaging for symptoms of urinary dysfunction and pelvic organ prolapse. Receiver-operating characteristic curves were developed to determine the correlation between a vaginal lump and pelvic organ prolapse on ultrasound and clinical assessment. In order to reduce the confounding effect of prolapse in other than the reference compartment, we included only patients with a prolapse that showed one compartment clearly dominant.

Results: A total of 1022 women were evaluated, of which 299 (29%) reported the symptom of a vaginal lump. The area under the curve for cystocele on ultrasound and clinical examination was 0.86 and 0.89, respectively. For rectocele, the areas were 0.81 for ultrasound and 0.89 for examination. The low number of women with an isolated uterine prolapse or enterocele limits the significance of the results for those two groups.

Conclusion: The symptom of a vaginal lump correlates strongly with the degree of female pelvic organ prolapse as ascertained on clinical examination and ultrasound imaging. Ultrasound and clinical examination perform very well as tests for predicting symptomatic prolapse, provided that the confounding effect of other compartments is accounted for.

Key words: cystocele, female pelvic organ prolapse, pelvic reconstructive surgery, rectocele, translabial ultrasound, uterovaginal prolapse.

Introduction

Female pelvic organ prolapse affects a large number of women, many of whom undergo surgical intervention. Over 200 000 surgical procedures are performed in the USA alone per year to treat prolapse, and there is a high number of re-operations. It is possible that such re-operations may be reduced by careful selection of those women who are more suitable to undergo surgery- that is, those in whom surgical intervention is most likely to relieve symptoms. One problem, however, is that there is thought to be a weak association between the degree of pelvic organ prolapse and symptoms. Some women with severe prolapse may have little discomfort, while some with minor stages still report symptoms. It is important therefore to carefully consider the relationship between symptoms and objective findings, in order to optimise the effect of surgery on the patient's symptoms. This may have to be approached separately for the three vaginal compartments, as it is often unclear as to whether given symptoms are caused by one or the other compartment. Since female pelvic organ prolapse is not necessarily a progressive condition, and since it is virtually never life-threatening, it is generally only
approached surgically in women who complain of symptoms of prolapse, and symptom relief should be the focus of any surgical intervention.

The aim of this study is to determine whether prolapse of a given compartment on clinical examination and on ultrasound correlates with the symptom of a vaginal lump, and to define the strength of this relationship.

**Methods**

A total of 1022 women were seen at a tertiary urogynaecological unit for symptoms of lower urinary tract dysfunction and pelvic organ prolapse. The assessment included an interview, clinical examination, multichannel urodynamics and imaging. 2D and 3D/4D capable ultrasound systems (Phillips ATL HDI 1000, Philips Medical Systems, North Ryde, NSW, Australia, and Medison SA 8000, Medison, Seoul, South Korea) were used to determine pelvic organ descent on maximal valsala (best of at least three attempts). In all cases, translabial ultrasound was carried out either by the senior author or personnel trained by him for at least 50 consecutive examinations, with the patients supine and after voiding.

The data collected were analysed using SPSS 15.0 statistical software (SPSS Inc., Chicago, IL, USA). Pearson chi-squared statistics were used to determine the relationship between a vaginal lump and other symptoms. Receiver-operating characteristic (ROC) curves were developed to determine the accuracy of ultrasound and clinical assessment of pelvic organ descent in predicting the sensation of a vaginal lump. Women who had prolapse of more than one compartment, without one being dominant (defined as 10 mm or more below the other compartments), were excluded from the ROC analysis, in order to control for the confounding effect of compartments other than the reference compartment.

The parent research project under which this analysis was undertaken was approved by the Human Research Ethics Committee of Sydney West Area Health Service (ref. 05-029).

**Results**

A total of 1022 women were included in the study, with a mean age of 55 years (range 18–94), and a mean parity of 2.76. Data on prolapse symptoms were missing for nine women. Of the remaining 1013 women, 299 (29.5%) reported the symptom of a vaginal lump. Seven hundred and ninety-five (78.1%) and 744 (73.1%) reported stress incontinence and urge incontinence, respectively, and voiding dysfunction occurred in 28.6% of the women with information on this symptom (see Table 1 for a complete listing of the prevalence of lower urinary tract symptoms). Because of a change in documentation during the study period, symptoms of voiding dysfunction were reliably recorded in only 814 patients.

Correlations between lower urinary tract symptoms and the sensation of a vaginal lump are given in Table 2. An inverse correlation was found between the presence of a lump in the vagina and stress incontinence ($\chi^2 = 9.638$, $P = 0.002$). Stress incontinence was less likely to be found in women with a vaginal lump (odds ratio (OR) = 0.610, 95% confidence interval (CI) 0.446–0.835). No association was found between a vaginal lump and urge incontinence ($\chi^2 = 2.192$, $P = 0.139$).

A positive correlation was found between the sensation of a vaginal lump and symptoms of voiding:

<table>
<thead>
<tr>
<th>Symptom</th>
<th>$\chi^2$</th>
<th>$P$</th>
<th>Odds ratio (95% confidence interval)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Stress incontinence</td>
<td>9.638</td>
<td>0.002</td>
<td>0.610 (0.446–0.835)</td>
</tr>
<tr>
<td>Urge incontinence</td>
<td>2.192</td>
<td>0.139</td>
<td>0.797 (0.591–1.076)</td>
</tr>
<tr>
<td>Frequency</td>
<td>0.173</td>
<td>0.678</td>
<td>1.061 (0.804–1.400)</td>
</tr>
<tr>
<td>Nocturia</td>
<td>0.121</td>
<td>0.728</td>
<td>0.953 (0.727–1.249)</td>
</tr>
<tr>
<td>Voiding dysfunction</td>
<td>12.736</td>
<td>&lt; 0.001</td>
<td>1.818 (1.306–2.529)</td>
</tr>
</tbody>
</table>
dysfunction, defined as hesitancy and/or stop-start voiding and/or straining to void ($\chi^2 = 12.736, P < 0.001$). Those women with a vaginal lump were 1.82 (95%CI 1.31–2.53) times more likely to experience symptoms of voiding dysfunction. Frequency and nocturia were not associated with prolapse symptoms.

In order to determine the correlation between the sensation of a vaginal lump and prolapse of a specific compartment, women without a dominant single compartment prolapse (that is, at least 10 mm or one clinical stage below the other compartments) were excluded from the analysis. One hundred and one women were found to have a dominant cystocele on ultrasound, whereas 121 were classified as having a dominant cystocele on examination. A dominant uterine prolapse was found in ten women on ultrasound and eight women on examination, and a dominant enterocele in nine and four women, respectively. Seventy-three women on ultrasound and 61 women on examination had a dominant rectocele. Data analysis on those patients was performed using ROC curves to determine the accuracy of both ultrasound and clinical examination in predicting symptomatic prolapse.

Anterior compartment descent was found to correlate very well with the feeling of a vaginal lump on both clinical examination and ultrasound, with area under the curve (AUC) values of 0.86 (95%CI 0.82–0.90) and 0.89 (95%CI 0.87–0.92), respectively (Fig. 1). This correlation was also reflected in the ROC curves for rectocele (Fig. 2), with AUC values of 0.89 (95%CI 0.86–0.92) for the clinical examination ROC curve and 0.81 (95%CI 0.77–0.85) for ultrasound.

Interestingly, uterine prolapse (Fig. 3) and enterocele (Fig. 4) had the highest AUC values; however, the low number of women in the study with these forms of prolapse lessens the significance of these results (see Table 3 for a summary).

**Discussion**

The primary aim of this study was to determine the correlation between the feeling of a lump in the vagina, and the degree of pelvic organ descent. This is an important correlation to ascertain, as it may help to determine what degree of prolapse is pathological, and more likely to require surgical intervention. While most symptoms, such as frequency and urinary
incontinence, have been found to correlate poorly with pelvic organ prolapse, this is not true for a vaginal lump, and a number of studies have found moderate correlations that were generally weaker than in our study.\textsuperscript{2,4,5} We found high AUC values for all compartments, both for clinical and ultrasound assessment, with $c = 0.81$ and 0.99.

The strong associations between symptoms and organ descent obtained in this study are unexpectedly high compared to the literature. Swift \textit{et al.} have previously used ROC curves to analyse the correlation between a bothersome vaginal lump and a prolapse.\textsuperscript{2} They obtained an AUC value of 0.75. The discrepancies with this study may originate from the fact that Swift \textit{et al.} did not exclude those women without dominant prolapse, and recent data obtained in a different population in our unit showed similarly lower AUC values when all women, including those with multicompartiment prolapse, were considered.\textsuperscript{6} Clearly, the state of one compartment acts as a confounder for prolapse symptoms caused by another compartment.

Interestingly, clinical examination appears to have a slightly better correlation than translabial ultrasound. There may be a number of reasons for this. Firstly, clinical examination and ultrasound use different lines of reference against which the prolapse is measured. In the clinical examination, the hymen is the reference point, whereas in ultrasound, the pubic symphysis is used. The hymen has previously been shown to be
Prolapse symptoms and organ descent

Secondly, it has been suggested that the pressure of the transducer against the perineum may at times cause an underestimation of the degree of pelvic organ descent, although great care was taken to avoid this effect in our study. Similar findings were reported in another project undertaken in our unit which considered the predictive power of clinical prolapse staging, POP-Q (pelvic organ prolapse quantification), and ultrasound prolapse assessment.

However, while there may well be a better correlation between the sensation of a lump and objective prolapse on clinical examination, ultrasound provides added information that makes it a valuable tool in the assessment of pelvic organ prolapse. Imaging, whether performed by ultrasound or magnetic resonance, allows for delineation of the organs which are actually prolapsing, for example, it can differentiate between a cystocele and a cystourethrocele, and between a true rectocele, perineal hypermobility and enterocele. Ultrasound can also be used to document levator ani trauma and anorectal function.

Given the high degree of correlation between prolapse and symptoms found in this study, why is it that some women with stage 0 or I prolapse report symptoms? One explanation may be related to the compartment which is undergoing prolapse, that is, one particular compartment may cause more symptoms than another. For example, uterine prolapse may be responsible for more symptoms than a cystocele or rectocele, and recent ultrasound data are supportive of this concept. Unfortunately, this issue is difficult to assess, as there are usually combinations of prolapsed compartments, such as a uterine prolapse with a cystocele. The low numbers of women with isolated uterine prolapse or enterocele limit the validity of our conclusions for this group of patients.

Conclusion

This study has confirmed that a vaginal lump correlates strongly with the degree of female pelvic organ prolapse as ascertained on clinical examination and ultrasound imaging. This is true for all forms of prolapse, provided that one controls for the confounding effect of multicomartment descent. No urinary tract symptoms apart from those of voiding dysfunction are positively associated with symptomatic pelvic organ prolapse.

References