The Laser Commode: A Novel Device for the Measurement of Perineal Descent

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Introduction

Perineal descent is a common finding in patients with pelvic floor dysfunction. It can be measured using a mechanical or radiological method; both approaches may be inaccurate\(^1,2\).

Aim

To evaluate a new device for perineal descent measurement. The new device (the laser commode) is compared to the established mechanical device, the Saint Mark's perineometer and the current gold standard method of measurement, defaecating proctography.

Materials and methods

- Patients with faecal incontinence, difficult defaecation, chronic constipation and rectal prolapse who had been investigated with defaecating proctography between January 2008 and May 2011 were included.
- The laser commode comprises a portable commode and a digital laser distance measurer. The commode platform consists of two wooden supports shaped with a medial ledge on each side. The distance measurer is placed on the floor; the distance from the measurer to the perineum is recorded at rest and on straining.
- The perineometer was constructed using the original description\(^3\). The frame is placed against the ischial tuberosities with the patient in the left lateral position. The measuring cylinder rests against the perineum. Movement of the perineum is measured in relation to the plane of the ischial tuberosities.

Figure 1. The Laser Commode

Figure 2. The Saint Mark’s Perineometer

- Proctographic images were reviewed retrospectively using Picture Archiving and Communications System software (Centricity, GE Healthcare, UK). The anorectal angle was used to represent the level of the pelvic floor and the top of the examination table seat was used as a consistent landmark. The vertical distance between the anorectal angle and the top of the seat was measured at rest and on straining. A magnification factor was applied.

Results

- The three methods of perineal descent measurement were compared in 38 patients (36 female.) The mean age was 59.5 years (range 36-78 years).

Figure 3. A pie chart showing the frequency of clinical diagnosis

Table 1. Mean perineal descent measurements using the three methods

<table>
<thead>
<tr>
<th>Method</th>
<th>Mean Perineal Descent (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perineometer</td>
<td>1.16</td>
</tr>
<tr>
<td>Laser Commode</td>
<td>0.69</td>
</tr>
<tr>
<td>Proctogram</td>
<td>0.75</td>
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</tbody>
</table>

Table 2. Mean bias of variation between each of the mechanical devices and the proctogram

<table>
<thead>
<tr>
<th>Method</th>
<th>Mean Bias</th>
<th>95% limits of agreement</th>
</tr>
</thead>
<tbody>
<tr>
<td>Perineometer</td>
<td>0.41</td>
<td>-1.15 – 1.97</td>
</tr>
<tr>
<td>Laser Commode</td>
<td>-0.66</td>
<td>-1.26 – 1.14</td>
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</tbody>
</table>

Interpretation of results

The mean perineal descent measurement using the laser commode is closer to that of the proctogram than the perineometer measurement. The mean bias of variation between the perineometer and the proctogram is 0.41cm; this represents a consistent overestimate by the perineometer. In the comparison of the laser commode and the proctogram the mean bias is -0.06cm. There is less of a discrepancy between the new device and the proctogram.

Conclusion

- The laser commode may be an accurate alternative mechanical device for perineal descent measurement which could be used both as a research tool and in the clinical setting to assess pelvic floor movement.

References