Voiding dysfunction after vaginal prolapse surgery: etiology, prevention and treatment
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Chapter 5

Patient preferences for clean intermittent catheterisation and transurethral indwelling catheterisation for treatment of abnormal post void residual bladder volume after vaginal prolapse surgery

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Abstract

Objective: To determine patient preferences for clean intermittent catheterisation (CIC) relative to transurethral indwelling catheterisation (TIC) as the treatment of abnormal post-void residual bladder volume (PVR) following vaginal prolapse surgery.

Design: Scenario-based preference assessment during face-to-face interview.

Setting: Teaching hospital.

Population: A sample of consecutive patients scheduled for vaginal prolapse surgery.

Methods: Preference for CIC relative to TIC was assessed using written treatment scenarios. Initially, treatment duration was set at 3 days and the risk for urinary tract infection (UTI) was 30% for both interventions. Both treatment duration and UTI risk related to TIC were kept constant. Treatment duration and UTI risk after CIC were varied until patients altered their preference. In this way, the duration of catheterisation and level of UTI risk related to CIC at which patients would prefer CIC to TIC could be determined.

Main outcome measures: Patients’ preference for CIC relative to TIC.

Results: When both duration of treatment and UTI risk were identical for both interventions, 64% of patients prefer CIC. Ninety-two percent of patients prefer CIC when CIC lasts 3 days but results in a 15% lower risk of UTI. Assuming that CIC results in a 15% risk of UTI, a total of 98 and 99% of patients prefer CIC to TIC when catheterisation with CIC last 2 and 1 day, respectively.

Conclusions: Most patients with abnormal PVR prefer CIC to TIC. The results of a recent randomised controlled trial showed that CIC resulted in a 2 days shorter catheterisation and more than 20% reduced risk of UTI. These conditions correspond to a preference of 99% of patients for CIC.
Introduction
Pelvic organ prolapse (POP) is a highly prevalent disease.\textsuperscript{1} One of the most frequent complications of POP surgery is incomplete emptying of the bladder. On the first postoperative day this risk varies from 1.5 to 40\%.\textsuperscript{2-5} To prevent bladder over-distention after surgery, most often indwelling catheters are inserted into the bladder during the period in which patients have the highest risk of abnormal post-void residual volume (PVR).\textsuperscript{6} The optimal duration of such indwelling catheterisation is debatable. If catheterisation is too short, the patient may encounter problems in adequately emptying the bladder. If catheterisation lasts too long there is an increased risk of colonisation of the bladder and increased costs arising from a longer period of hospitalisation.\textsuperscript{3,4} Whichever method of catheterisation after POP surgery is chosen, some patients will present with an abnormal PVR after the removal of the catheter. The optimal management in these patients has not been defined. One could decide to either replace the transurethral indwelling catheter (TIC) for a given period or start clean intermittent catheterisation (CIC). Intermittent catheterisation has been shown to be well accepted by patients.\textsuperscript{7-9} Even so, no formal studies have compared and established the preferences for these treatment modalities. As it is generally acknowledged that preference assessment should be incorporated into medical decision making,\textsuperscript{10} our objective was to investigate whether patients prefer CIC or TIC for the treatment of abnormal PVR after vaginal prolapse surgery.

Materials and Methods
The patient’s preference for CIC relative to TIC was assessed during a face-to-face interview, using written treatment scenarios.\textsuperscript{12,13} This study was performed in the Spaarne Hospital, Hoofddorp, the Netherlands. Approval was obtained from the local medical ethics committee. Patients were eligible if they were 18 years of age or older, were scheduled for vaginal prolapse surgery and had never been catheterised before. Patients were not eligible if they had a neurological or anxiety disorder, or if they underwent vaginal prolapse surgery combined with anti-incontinence surgery. Written informed consent was obtained from each patient. All were interviewed by the same gynaecologist between June 2008 and March 2009.

Written scenarios for both treatments included a description of the procedure of that specific method of catheterisation. The first method was TIC for 3 days, and the second method was CIC. The essential difference between the two interventions was clarified: that is, the difference between the placement of an indwelling catheter for 3 days (TIC) versus the repeated insertion of a catheter (CIC) for the same period of time. In the initial description of both interventions, treatment duration was set at 3 days and the risk of urinary tract infection (UTI) was estimated as 30\%. The duration of
3 days was based on a recent survey to evaluate current clinical practice in the Netherlands, which showed that this duration is one of the most popular treatment protocols. The estimation of a 30% risk of UTI was based on studies reporting an increased risk of UTI of 10% per additional day with the placement of an indwelling catheter. After having read both treatment scenarios, patients were asked which mode of intervention they would prefer in the case of abnormal PVR. Furthermore, we asked patients about factors affecting their preference other than the ones that were structurally assessed in the interview (UTI and duration of treatment). We asked five experts in the field of urogynaecology to subclassify these reasons into main categories.

After patients expressed their preference for CIC or TIC based on the initial scenario, the duration of treatment and UTI risk after CIC were systematically varied until patients switched from their initially preferred intervention to the other.

Patients who initially preferred CIC

If CIC was the initially preferred intervention, we quantified at which risk of UTI patients were willing to switch their preference to TIC (assuming that TIC implicated a duration of 3 days and risk of UTI of 30%). For this purpose, we first presented the patients scenarios in which the duration of CIC treatment remained 3 days, whereas the risk of UTI was gradually raised with steps of 5% from 30% to a maximum of 45%. We recorded at what level of UTI risk the patient switched preference to TIC. Subsequently, we recorded at what duration of CIC the patient would switch back from TIC to CIC. Scenarios were presented with a standardised UTI risk at the particular level defined in the previous experiment, whereas the duration of CIC treatment was decreased (in steps of 1 day) from 3 to 1 day. In all of these scenarios, TIC meant a treatment duration of 3 days and a UTI risk of 30%.

Patients who initially preferred TIC

If TIC was the initially preferred intervention, the next step from the initial scenario was to investigate whether these patients would switch from TIC to CIC if CIC resulted in faster recovery to normal PVR bladder volume. The duration of CIC treatment was decreased in steps of 1 day from 3 to 1 day, whereas the UTI risk remained at 30% for both interventions. We recorded at what duration of treatment patients switched preference from TIC to CIC. Subsequently, we measured at which level of UTI risk patients would switch preference from TIC to CIC. To do so, we returned to the initial scenario and first decreased the UTI risk with CIC treatment in steps of 5%, from an initial level of 30 to 15%, whereas the duration of CIC remained at 3 days. Then we increased the UTI risk related to CIC in
steps of 5%, from the initial level of 30 to 45%.
After these steps, preferences were assessed for all 12 remaining combinations in which duration of treatment differed by 1 or 2 days in favour of CIC with a 5, 10 and 15% lower or higher UTI risk with CIC.

Data analysis
Patients’ preference for CIC relative to TIC was the main outcome measure. For each combination of UTI risk and duration of treatment using CIC, we determined whether patients preferred CIC to TIC, or not. A preference for CIC was assigned a score of 1. No preference for CIC was assigned a score of 0. The proportion of patients that preferred CIC as opposed to TIC for each combination of UTI risk and duration of treatment was quantified. To investigate the independent influence of UTI risk and duration of treatment on preference for CIC relative to TIC, we applied a repeated-measures logistic regression analysis by the generalised estimating equations (GEE) method with a logit link, a binomial distribution and unstructured correlation. GEE accounts for the correlation between preferences within a patient across scenarios. We estimated odds ratios and 95% confidence intervals on preferring CIC to TIC at the various risks of UTI after CIC, and duration of treatment for CIC, using GEE. We investigated whether demographic (age and educational level) and clinical characteristics (body mass index, parity, and prolapse severity measurements using the POPQ classification being the most distal portions of anterior wall (Ba), posterior wall (Bp) and position of the cervix (C)) were associated with a preference for CIC using GEE. Data analysis was conducted using spss 16.0.

Table 1: Patient characteristics (n = 85)

<table>
<thead>
<tr>
<th>Characteristic</th>
<th></th>
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<tbody>
<tr>
<td>Age (years)</td>
<td>66.1</td>
</tr>
<tr>
<td>BMI (kg/m²)</td>
<td>25.6</td>
</tr>
<tr>
<td>Parity</td>
<td>2</td>
</tr>
<tr>
<td>Educational level</td>
<td></td>
</tr>
<tr>
<td>Below compulsory- or compulsory school education</td>
<td>33/82 (40%)</td>
</tr>
<tr>
<td>Lower vocational school</td>
<td>22/82 (27%)</td>
</tr>
<tr>
<td>Advanced vocational school or university</td>
<td>27/82 (33%)</td>
</tr>
<tr>
<td>Ba (cm)</td>
<td>0,54</td>
</tr>
<tr>
<td>Bp (cm)</td>
<td>-1,71</td>
</tr>
<tr>
<td>C (cm)</td>
<td>-2,11</td>
</tr>
</tbody>
</table>

1. Data are presented as means (SDs) or number (%), unless otherwise indicated.
2. Ba, Bp and C are quantitative measurements of the degree of prolapse of anterior, posterior and apical compartments.
Results

A total of 94 consecutive patients were asked to participate in this study, of which 86 (89%) patients agreed to be interviewed. Two patients refused to participate after receiving the written study information, and three patients agreed to participate but had difficulty understanding the questions, and consequently retired from the study. Another three patients were unable to express a preference for one of the interventions, and could therefore not complete the interview.

The characteristics of patients who participated in the preference study are shown in Table 1. The mean age of the interviewed patients was 66 years. The patients predominantly suffered from prolapse of the anterior compartment. The duration of treatment and UTI risk both had a statistically significant effect on patient preference for CIC (Table 2). None of the demographic and clinical characteristics were significantly associated with a preference for CIC (data not shown).

### Table 2: Independent effects of duration of hospitalisation and risk of bacteriuria on preference for clean intermittent catheterisation

<table>
<thead>
<tr>
<th></th>
<th>OR (95% CI)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Duration of hospitalisation for CIC</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3 days</td>
<td>Reference</td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>2 days</td>
<td>1.64 (1.34 - 2.01)</td>
<td></td>
</tr>
<tr>
<td>1 day</td>
<td>3.97 (3.00 - 5.26)</td>
<td></td>
</tr>
<tr>
<td><strong>Risk of bacteriuria after CIC</strong></td>
<td></td>
<td>&lt; 0.001</td>
</tr>
<tr>
<td>45%</td>
<td>0.05 (0.03 - 0.08)</td>
<td></td>
</tr>
<tr>
<td>40%</td>
<td>0.15 (0.10 - 0.23)</td>
<td></td>
</tr>
<tr>
<td>35%</td>
<td>0.37 (0.27 - 0.51)</td>
<td></td>
</tr>
<tr>
<td>30%</td>
<td>Reference</td>
<td></td>
</tr>
<tr>
<td>25%</td>
<td>1.57 (1.16 - 2.13)</td>
<td></td>
</tr>
<tr>
<td>20%</td>
<td>2.51 (1.58 - 4.00)</td>
<td></td>
</tr>
<tr>
<td>15%</td>
<td>4.94 (2.62 - 9.32)</td>
<td></td>
</tr>
</tbody>
</table>

OR = odds ratio
CI = confidence interval
CIC = clean intermittent catheterisation
UTI = urinary tract infection
TIC = transurethral indwelling catheterisation.

Figure 1 shows the proportion of patients preferring CIC to TIC for each combination of duration and UTI risk of CIC, as compared with a fixed TIC treatment regimen that implies a 30% risk of UTI and 3-day duration of treatment.
Figure 1: Patient preferences for CIC, relative to TIC.

CIC = clean intermittent catheterisation
UTI = urinary tract infection
TIC = transurethral indwelling catheterisation

In the initial scenario, in which the risk of UTI was set at 30% and the duration of treatment was set at 3 days for both treatments, a total of 64% of the patients would prefer CIC. Reducing the risk of UTI related to CIC and decreasing the duration of treatment after CIC both resulted in an increased proportion of patients preferring CIC to TIC. When CIC and TIC carry a similar risk of UTI and the duration of treatment is 2 days shorter with CIC, the proportion of patients preferring CIC increased from 64 to 90%. If the UTI risk was estimated as 15% lower in the CIC group and the CIC treatment duration was also made 1 or 2 days shorter than for TIC, the proportion of patients preferring CIC increased to 98 and 99%, respectively.

Increasing the risk of UTI for CIC diminished the preference for CIC. Even so, 28 and 36% of patients would prefer CIC in the case of a 15% higher risk of UTI if CIC resulted in 1 or 2 days shorter treatment, respectively.

Of the 86 participants, 74 (86%) provided a reason for their initial preference. The group of experts categorised these reasons, which resulted in four domains: expected discomfort; safety; autonomy; and pain.

Of the 31 patients who preferred TIC, 24 (77%) did so based on expected discomfort
Chapter 5

of repeated catheter introductions with CIC. Other reasons expressed were the expectation that TIC was safer (13%) or less painful (11%). Of the 55 patients who preferred CIC, 45 (82%) patients provided a reason why they preferred CIC. The reasons included: the expectation that CIC would give less discomfort than TIC (n = 24, 53.3%); the expectation that CIC would give more autonomy (n = 15, 33.3%); and the expectation that CIC was associated with less pain (n = 6, 13.3%).

Discussion

We investigated whether patients scheduled for vaginal prolapse surgery would prefer either CIC or TIC in the case of abnormal PVR after withdrawal of the postoperatively placed catheter. We did so by scenario-based preference assessment during a face-to-face interview.

The majority of the patients interviewed would prefer CIC if the duration of treatment and the risk of UTI is similar for both interventions. In this situation, most patients made this choice based on the expected level of discomfort of the treatments. When CIC is predicted to last 3 days and has a 15% lower risk of UTI than TIC, the proportion of patients preferring CIC increases to 92%. Assuming that CIC resulted in a 15% lower risk of UTI, and also in a shorter duration of treatment by 1 or 2 days, compared with TIC, 98 and 99%, respectively, of patients preferred CIC to TIC.

All patients in the study were scheduled for vaginal prolapse surgery, and were thus at risk of developing abnormal PVR after surgery. However, they were interviewed before the operation, and thus did not know whether they would suffer from abnormal PVR and how much bother this would cause. It is possible that only patients who have actually experienced a certain disease or treatment can fully understand the burden of the situation and can make choices between the possible interventions. However, based on the fact that most patients successfully completed the interview, we think that the explanation of the condition was well understood.

In the initial scenario the risk of UTI and duration of catheterisation were identical, in order to establish the actual preference for the method of catheterisation itself, and not for the impact of consequences of the intervention, such as duration of catheterisation or risk of UTI. From assessing the factors through open questions it appeared that a few patients had anticipated that CIC could result in a shorter duration of treatment.

Furthermore, we did not assess preferences including the possibility that treatment might be continued after 3 days, because the choices for the patients would have become too hypothetical to understand. In our opinion, this simplification of true practice can be justified by the fact that only a minority of patients actually experience abnormal PVR after 3 days.
Only patients who had never been catheterised before were interviewed, because previous experiences with catheterisation might influence a patient’s preference. Other studies have shown that patients who have actually undergone a certain intervention tend to prefer that particular intervention. One could argue about whether the duration of TIC, which was set at 3 days, is realistic. This duration was based on a recent survey to evaluate current clinical practice in the Netherlands. We cannot compare our results with those of others, as this study is, as far as we are aware, the first to quantify whether patients prefer TIC or CIC. Given the observation that patients prefer CIC when the duration of treatment and risk of UTI are similar for TIC, it is understandable that the preference for CIC increases with a shorter duration of catheterisation and a lower risk of UTI. It appeared that even 36% of patients preferred CIC when it was associated with a higher risk of UTI as long as CIC resulted in the faster recovery of normal bladder function. Parallel with this preference study we randomly compared both interventions, and observed that CIC reduced the duration of catheterisation on average by 54 hours. The risk of UTI in the CIC group was 14%, versus 38% in the TIC group, which exceeds the maximal difference in UTI risk in the scenarios. The scenario that best represents the results of our randomised controlled trial would imply that 99% of patients prefer CIC to TIC.

**Conclusion**
We have found that CIC is highly preferred to TIC for the treatment of abnormal PVR after vaginal prolapse surgery. The results of a recent randomised controlled trial showed that CIC resulted in a shorter duration of catheterisation by 2 days and a >20% lower risk of UTI. These conditions correspond with a preference of 99% of patients for CIC.
Chapter 5

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