Midurethral Sling Procedures for Stress Urinary Incontinence in Women Over 80 Years

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Aims: To compare the safety and efficacy of midurethral sling surgery for management of urinary stress incontinence in women over 80 years versus younger women. Methods: 1225 consecutive women with urodynamic stress incontinence had a synthetic midurethral sling (955 retropubic, 270 transobturator) at our institution between 1999 and 2007. Ninety one percent (n=1112) of the patients were interviewed via phone call with a structured questionnaire and were included in the analysis. The mean follow-up was 50±24 months (range 12–114). Comparison between elderly (≥80 years, n=96) and younger patients (<80 years, n=1016) was performed. Results: The overall subjective cure rate was 85% (elderly 81%, younger 85%, P=0.32). There was no significant difference in cure rate between retropubic and transobturator sling in the elderly group (82% vs. 79.3%, P=0.75). The bladder perforation rate was similar between the two groups (3%). The hospitalization time was significantly longer in the elderly (1.6 ± 1.7 days vs. 0.7 ± 1.1 days, P<0.001). However, major perioperative complications were uncommon (1%). Of the patients who had an isolated sling procedure, 37% of the elderly and 9% of the young patients failed their 1st trial of void (P<0.001). However, the long-term rate of voiding difficulty was similar between the two groups (elderly 8% vs. young 6%, P=0.21). The rate of de novo urge incontinence was similar between the two groups (7%). Conclusion: Retropubic and transobturator slings in women older than 80 years are effective and safe but are associated with an increased risk of transient postoperative voiding difficulty. Neurourol. Urodynam. 29:1262–1266, 2010. © 2010 Wiley-Liss, Inc.

Key words: elderly; sling; stress urinary incontinence; outcome; women

INTRODUCTION

Minimally invasive midurethral slings have become the first line surgical treatment for stress urinary incontinence (SUI) in women. As the population of elderly women increases, so will the demand for effective surgical management of SUI in this group. Previous studies have suggested that the retropubic sling is a safe and efficient procedure which significantly improves the quality of life of elderly women. However, in these studies the majority of the women were younger than 80 years and the analyses did not include transobturator slings. Previous studies have shown a significant increase in postoperative morbidity and mortality after SUI surgery in the elderly, and many physicians and geriatricians would not consider surgery as an option for this reason. However the synthetic midurethral slings have largely replaced open surgical procedures such as the Burch colposuspension and rectus fascial slings and now may be a good option for the stress incontinent elderly improving the quality of life with a low risk of morbidity.

In our study, we evaluated the efficacy and safety of retropubic and transobturator midurethral slings for the treatment of SUI in women aged over 80 years. A comparison of efficacy and safety of midurethral slings between older and younger patients was performed.

MATERIALS AND METHODS

After receiving approval from our institutional ethics board, we reviewed the medical records of 1,225 consecutive women (mean age 60±12.9 years) who underwent minimally invasive midurethral sling surgery from May 1999 to August 2007. The assessment included demographic information, medical history, urinary symptoms evaluation, physical examination, bladder diary, urodynamics, and surgical reports. A detailed proforma was used for documentation of the preoperative data. All the definitions used are according to the recommendations of the International Continence Society. Intrinsic sphincter deficiency (ISD) was defined as either a maximum urethral closure pressure of 20 cmH2O or less and/or a pressure rise from baseline required to cause incontinence (A Valsalva or cough leak point pressure) of 60 cmH2O or less. Nine hundred fifty-five slings (78%) were retropubic (TVP 87%, advantage sling 11%, SPARC 2%) and 270 (22%) were transobturator slings (Monarc 91%, TVT-O 9%). All slings were performed in the standard manner as described previously. Retro pubic hydro-dissection using local anesthetic and normal saline injection was done in all retropubic slings. Intraoperative cystoscopy was performed routinely in all retropubic and transobturator slings. Thirty-eight percent (n=418) of the slings were done by less experienced surgeons (fellows and registrars) whose experience varied but was less than 50 slings.

Trial of void (TOV) was performed immediately at the end of the surgery in patients who had an isolated sling procedure. An indwelling urethral catheter was left routinely for 24 hr in patients who had concomitant vaginal prolapse surgery or if bladder injury had occurred. A failed TOV was defined as the postvoid residual volume (PVR) >150 ml or urinary retention.

Conflicts of interest: none.

Linda Brubaker led the review process.

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Received 24 July 2009, Accepted 3 November 2009 Published online 28 April 2010 in wileyonlinelibrary.com DOI 10.1002/nau.20862
Patients who failed two consecutive TOV were discharged home with an indwelling catheter for 1 week or managed with intermittent catheterization.

Postoperatively, patients were scheduled for evaluation at 6 weeks, 6, 12, 18, and 24 months and annually thereafter. However, most of the patients did not attend the clinic after 2 or 3 follow-up visits. Therefore, in order to complete this study, patients were interviewed via phone calls with a structured questionnaire (Appendix) examining urinary symptoms, pain and need for subsequent anti-incontinence surgery. The questionnaire was administered by an independent research secretary who was hired especially for this purpose.

The questionnaire included questions from previously validated questionnaires: the Urogenital Distress Inventory,7 Pelvic Floor Distress Inventory,18 and the Pelvic Organ Prolapse/Urinary Incontinence Sexual Questionnaire.19

Ninety-one percent of the patients (n = 1,112) completed the questionnaire and were included in the analysis. The remaining patients could not be contacted due to death (n = 21) or change of residence (n = 92). The minimum follow-up was 12 months (mean 50 ± 24 months; range 12–114 months). Subjective cure was considered in those women who had no subsequent anti-incontinence surgery and who responded "no" to the question of leaking urine during physical activity, coughing or sneezing (Appendix, question 2).

Data were analyzed with SPSS software (statistical package for the social sciences, version 16.0). A P-value of less than 0.05 was considered significant. Chi-square tests and t-tests were performed to compare older (age ≥ 80 years) with younger (age < 80 years) women for categorical and continuous variables, respectively. Groups’ sizes were large enough to use parametric tests by the central limit theorem. The main outcome measures were subjective cure rate, perioperative morbidity and long-term complications. In order to evaluate whether age is an independent predictor for sling failure, multivariate analysis for the prediction of events was performed with logistic regression models. The significant level of entering and removing an explanatory variable were set to 0.05 and 0.10, respectively. The goodness of fit of the model to the observed events rates was evaluated by the Hosmer–Lemeshow statistic.

RESULTS

Of the study population, 96 (9%) were classified as elderly (mean age 85 ± 3.5 years) and 1,016 (91%) as younger (mean age, 58 ± 11 years). Comparison of demographic, surgical and preoperative variables between aged and younger participants is summarized in Table I.

Perioperative details and follow-up data are presented in Table II. The overall subjective cure rate was 85% (elderly group 81%, young group 85%, P = 0.32). Eighty-nine percent of the elderly and 91% of the younger patients (P = 0.11) responded “yes” to the question: “Would you recommend this operation to someone else with incontinence?” (Appendix, question 9).

Of note, the overall subjective cure rate of retropubic sling was higher than the transobturator sling (86% vs. 80%, P = 0.03). This difference was also noted in the younger group (retropubic 86.2% vs. transobturator 80.6%, P = 0.04). However, in the elderly group, the difference between the two surgical approaches was not significant (retropubic 82% vs. transobturator 79.3%, P = 0.75).

<table>
<thead>
<tr>
<th>TABLE I. Demographic, Surgical, and Preoperative Characteristics of Sling Patients—Comparison Between Elderly and Younger Patients (n = 1112)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean age—years Mean BMI No. diabetes mellitus No. Parkinson No. coronary artery disease No. previous CVA No. previous hysterecomy No. previous anti-incontinence surgery No. previous prolapse surgery No. previous urgency (%) No. previous prolapse (%) No. experienced (%) No. inexperienced (%) No. bladder perforation (%)</td>
</tr>
<tr>
<td>85 ± 3.5 (85) [80–95]</td>
</tr>
<tr>
<td>27.2 ± 4.9 (26) [18–42]</td>
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<tr>
<td>27.2 ± 4.9 (26) [18–42]</td>
</tr>
<tr>
<td>27.2 ± 4.9 (26) [18–42]</td>
</tr>
</tbody>
</table>

SD, standard deviation; BMI, body mass index; CVA, cerebrovascular accident; CS, Cesarean section; ISD, intrinsic sphincter deficiency (MUCP <20 cmH2O).

aData presented as mean ± SD (median) [range].

Neurourology and Urodynamics DOI 10.1002/nau
The subjective cure rate in the elderly group was similar between patients who had ISD and patients without ISD (77% vs. 83%, P = 0.22). However, in the younger group the subjective cure rate was significantly lower in the patients who had ISD compared to those without it (66% vs. 88%, P = 0.01).

The logistic regression model revealed six significant independent risk factors for sling failure (Table III). Interestingly, patient’s age was not found to be an independent risk factor for failure.

The small number of major age-related complications such as myocardial infarction or thrombo-embolic events occurred in patients who underwent concomitant prolapse repair. Twenty-one out of 57 elderly patients (37%) who had isolated sling procedure failed their 1st TOV compared to 58 out of 651 younger patients (9%,
P = 0.001).

Fourty percent (n = 404) of the younger patients were sexually active and had isolated sling procedure. Of this group, 17 patients (4%) reported new onset dyspareunia that was not present before the procedure. In the elderly group, only two patients (2%) were sexually active and none had postoperative dyspareunia.

DISCUSSION

Urinary incontinence confers a substantial social, medical, and economic burden for the older female population.20 The prevalence of SUI has been reported to be up to 40% in women older than 70 years and one-third of them classify their incontinence as severe.21 As the number of older women increases and the morbidity of stress incontinence procedures decreases, the demand for surgical treatments for SUI in this age group will continue to grow.

Previous studies demonstrated 67–95% success rates of retropubic slings in elderly women.3–7,9,22,23 However, there are considerable differences between these studies in the length of follow-up, definition of cure and methodologies. In addition, the mean age of the older group varied in each study (range 65–76 years), and it is not clear if there are significant differences in cure rates and morbidity among patients aged more than 80 years compared with younger patients.

We evaluated the efficacy and safety outcomes of both retropubic and transobturator slings in women aged more than 80 years (mean 85 ± 3.5 years) with a mean follow up of 4.2 years (1–9.5 years). In our study, the overall subjective cure rate in elderly was quite high and was not significantly different from the younger patients (81% vs. 85%, P = 0.32). The fact that 90% of the patients in both groups stated that they would recommend this operation to someone else with SUI reflects a high satisfaction rate.

As described previously,4,5 our elderly patients had significantly higher rate of ISD. Interestingly, in elderly women the subjective cure rate between non-ISD and ISD-patients was similar. Furthermore, there was no difference in the subjective cure rate between transobturator and retropubic sling in elderly women. In the younger group, subjective cure rates were significantly higher in non-ISD patients compared to ISD-patients and in retropubic slings compared to transobturator slings. A possible explanation for these findings can be related to the fact that elderly women are less active.

We found that the prevalence of age-associated comorbidities such as neurological and coronary heart diseases was significantly higher in the elderly group. There were no differences between the two age groups regarding rates of previous prolapse or anti-incontinence surgery, previous hysterectomy, urgency symptom, type of anesthesia, surgeon’s experience, and concomitant prolapse surgery.

The bladder perforation rate in our study was similar (3%) in both age groups. Previous studies2–9,6,7,22,24 did not find that age is a risk factor for bladder perforation. Only one study4 demonstrated significantly fewer cases of bladder perforation among elderly women (1.3% vs. 4.9%, P < 0.05).

Interestingly, the rate of major postoperative complications in the elderly group was low. Only one patient had a myocardial infarct. There were no neurological or thrombotic complications and no deaths. Although major perioperative complications were rare, the mean hospitalization time was

### TABLE II. Follow-Up and Postoperative Characteristics—Comparison Between Elderly and Younger Patients (n = 1,112)

<table>
<thead>
<tr>
<th>Age ≥80 years (n = 96)</th>
<th>Age &lt; 80 years (n = 1,016)</th>
<th>P-value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mean admission length—days&lt;sup&gt;a,b&lt;/sup&gt;</td>
<td>1.6 ± 1.7 (1) [0–10]</td>
<td>0.7 ± 1.1 (1) [0–7]</td>
</tr>
<tr>
<td>No. pelvic hematoma (%)</td>
<td>0</td>
<td>3 (0.3)</td>
</tr>
<tr>
<td>Age-related major complications</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No. MI (%)</td>
<td>1 (1)</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>No. CVA (%)</td>
<td>0</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>No. PE (%)</td>
<td>0</td>
<td>1 (0.1)</td>
</tr>
<tr>
<td>No. pneumonia (%)</td>
<td>0</td>
<td>2 (0.2)</td>
</tr>
<tr>
<td>No. failed 1st TOV (%)&lt;sup&gt;b&lt;/sup&gt;</td>
<td>21 (37)</td>
<td>58 (9)</td>
</tr>
<tr>
<td>No. sling division (%)</td>
<td>2 (2)</td>
<td>10 (1)</td>
</tr>
<tr>
<td>Mean follow-up—months&lt;sup&gt;a&lt;/sup&gt;</td>
<td>48 ± 24 (43) [12–105]</td>
<td>51 ± 24 (48) [12–114]</td>
</tr>
<tr>
<td>No. subjective cure (%)</td>
<td>78 (81)</td>
<td>864 (85)</td>
</tr>
<tr>
<td>No. de novo urgency symptoms (%)</td>
<td>18 (18)</td>
<td>158 (16)</td>
</tr>
<tr>
<td>No. de novo UUI (%)</td>
<td>7 (7)</td>
<td>75 (7)</td>
</tr>
<tr>
<td>No. persistent UUI (%)</td>
<td>5 (5)</td>
<td>61 (6)</td>
</tr>
<tr>
<td>No. de novo voiding difficulty (%)</td>
<td>8 (8)</td>
<td>63 (6)</td>
</tr>
<tr>
<td>No. subsequent SUI surgery (%)</td>
<td>1 (1)</td>
<td>9 (1)</td>
</tr>
</tbody>
</table>

SD, standard deviation; SUI, stress urinary incontinence; UUI, urge urinary incontinence; TOV, trial of void; MI, myocardial infarct; CVA, cerebrovascular accident; PE, pulmonary embolus.

<sup>a</sup>Data presented as mean ± SD (median) [range].

<sup>b</sup>In patients who had isolated sling procedure (57 elderly; 651 young).

BMIs, body mass index; OR, odds ratio; CI, confidence interval.

Neuurology and Urodynamics DOI 10.1002/nau
significantly longer in elderly compared to younger patients (1.6 ± 1.7 vs. 0.7 ± 1.1 days, P < 0.001). One explanation is that surgeons are more concerned about postoperative complications in the elderly and tend to avoid early discharge, compared to younger patient groups. Most studies report a number of days of hospital stay with a mean period ranging from 1.1 to 5.6 days.3–7

The high rate of failed 1st TOV in elderly patients also contributes to the longer hospitalization time. More than one-third of the elderly who had isolated sling procedure failed their 1st TOV compared to only 9% in the younger patients (P < 0.001). This finding was contrasted by Karantantis et al.,25 with the failure of the 1st TOV in the elderly group at 3% compared with the younger patients at 15%. However this study did not reach statistical significance.

The rate of postoperative voiding difficulty depends on the definition. Although there is no current consensus on what constitutes significant voiding dysfunction after sling procedure, previous studies demonstrated that elderly women had more voiding problems in the perioperative period.1,2,3

In most cases long-term voiding problems are uncommon.1,4–6,9 Walsh et al.9 showed that all women had normal voiding function by 1 month after surgery and Sevestre et al.5 found that only 1 patient out of 76 women older than 70 years had voiding difficulty more than 1 week postoperatively. The rate of long-term subjective voiding difficulty in our study was similar between elderly and younger patients (8% vs. 6%, P = 0.21). Consistent with previous studies,2,2,5 the rate of tape division in our group was quite low. Two elderly (2%) and 10 younger patients (1%) required tape division because of ongoing voiding difficulty. Only one study20 has demonstrated a significantly higher rate of tape division in elderly (22%) than in younger patients (1%).

The rate of de novo urgency and de novo urinary urge incontinence (UUI) in our study was similar between the two age groups. Two studies of TVT reported that de novo UUI occurred more often in older women,2,2 but others found this outcome occurred at similar rates in older and younger women.5,9,25

In this study, we present our results of midurethral sling procedures in elderly and compared it to younger patients. Elderly patients were more complex, in that they had more comorbidities and higher rates of ISD and mixed urinary incontinence. Despite these issues our older patients tolerated the sling procedure well and demonstrated high subjective cure rates. For these reasons the midurethral sling is our SUI procedure of choice in the elderly.

Temporary voiding difficulty was the main complication in the perioperative period in the elderly group. A high index of suspicion to avoid over-distension injuries and preoperative counseling to anticipate the possibility of temporary voiding difficulty would be helpful. In our experience, elderly women for a number of reasons are less likely to perform intermittent self-catheterization.

This study has the limitations consistent with the retrospective nature of its design, although documentation using the same standardized proforma for over 10 years would suggest that the data was of consistent quality. Furthermore, clinical objective measures to evaluate success were not utilized and the modified questionnaire used for follow-up was not a validated tool.

It is important to confirm our findings by a well-designed prospective study to investigate outcomes in women older than 80 years.

In previous studies, the mean age of the elderly group was at most 76 years and in all of them the sling was retropubic (TVT or SPARC). This study is the largest (n = 96) with the oldest group of patients (mean age 85 ± 3.5 years) in the current literature, and includes transobturator slings. However, there may not have been enough older subjects in order to demonstrate differences between older and younger subjects for low incidence outcomes.

CONCLUSIONS

We consider the retropubic and transobturator midurethral sling as a safe and effective treatment for SUI in women over 80 years. The incidence of intraoperative and long-term complications is low and similar to younger patients. Transient postoperative voiding difficulty is significantly more frequent in elderly patients. Midurethral slings should be considered a treatment option in women over 80 who failed conservative treatment.

APPENDIX

<table>
<thead>
<tr>
<th>Question</th>
<th>Questionnaires</th>
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<tbody>
<tr>
<td>Do you experience any urine leakage?</td>
<td>UDI</td>
</tr>
<tr>
<td>Do you experience urine leakage related to physical activity, coughing or sneezing?</td>
<td>UDI</td>
</tr>
<tr>
<td>Do you experience a strong feeling of urgency to empty your bladder?</td>
<td>UDI</td>
</tr>
<tr>
<td>Do you experience urine leakage related to the feelings of urgency?</td>
<td>UDI</td>
</tr>
<tr>
<td>Do you usually experience difficulty emptying your bladder?</td>
<td>PFDI—20</td>
</tr>
<tr>
<td>Are you sexually active?</td>
<td>Non Specific</td>
</tr>
<tr>
<td>Did you experience difficulty emptying your bladder?</td>
<td>Non Specific</td>
</tr>
<tr>
<td>Do you feel pain during sexual intercourse?</td>
<td>PISQ</td>
</tr>
<tr>
<td>Did you have another surgery for incontinence since your last one at our medical center?</td>
<td>Non Specific</td>
</tr>
<tr>
<td>Would you recommend this operation to someone else with incontinence?</td>
<td>Non Specific</td>
</tr>
</tbody>
</table>

UDI, Urogenital Distress Inventory;17 PFDI, Pelvic Floor Distress Inventory;18 PISQ, Pelvic organ prolapse/Urinary incontinence Sexual Questionnaire.19

Neurourology and Urodynamics DOI 10.1002/nau
REFERENCES


