

THE IMPACT OF HIP REPLACEMENT SURGERY ON URGENCY RELATED URINARY INCONTINENCE

Hypothesis / aims of study

We made the clinical observation that some women with urgency related urinary incontinence date the onset of their problem with bladder control to the time of hip replacement. This observation has also been made by local physical therapists. However, little data are available on this subject. A retrospective study by Palmer and co-workers found a significant increase in urinary incontinence in men and women hospitalized for hip fracture (1). They reported a doubling in the prevalence of urinary incontinence from 20% to 40% pre-operatively and following surgery, respectively. A recent retrospective review by Palmer and co-workers showed that 21% of women age 60 years and older, who underwent surgical correction of hip fracture, developed hospital-acquired urinary incontinence (2). This study was based on chart review of 6516 women hospitalized for hip fracture. Both of these studies are limited in that the information gathered is only as accurate as the documentation of data in the medical records. The studies are further limited by the brevity of follow-up of 30 days or less.

The objective of this study was to prospectively determine the incidence of *de novo* urgency related incontinence following total hip replacement.

Study design, materials and methods

All adult men and women scheduled for total hip replacement with a single surgeon at the Department of Orthopaedics were eligible for participation in this study. Participants received four questionnaires before or at their pre-operative visit:

- (1) Modified version of the Detrusor Instability Score Questionnaire
- (2) Urogenital Distress Inventory - short form
- (3) Incontinence Impact Questionnaire
- (4) Mobility and Incontinence Questionnaire

Participants returned the completed questionnaires and consent form prior to surgery. Study participants were asked to complete the same four questionnaires post-operatively while still in the hospital and again after three months following rehabilitative physical therapy. Medical records were reviewed and data collected on past medical and surgical history, medication, complications with surgery and hospital stay. We determined through power analysis that 100 subjects would be needed to detect a $\geq 20\%$ difference in the prevalence of urinary incontinence before and after hip replacement surgery at the 5% significance level with 80% power. Data collected was analyzed using Chi-square testing and multiple regression analysis.

Results

112 subjects completed this prospective study. Of these, 52 (46%) were men and 60 (54%) women. Baseline demographic characteristics are summarized in Table 1.

Table 1: Demographics

	Women [mean (range)]	Men [Mean (range)]
Age (years)	64.2 (28 – 85)	65.9 (41 – 82)
BMI (range)	28.6 (18.7 – 44.4)	30.6 (22.9 – 59.8)
Hypertension (#)	53% (32)	50% (26)
Diabetes (#)	5% (3)	0% (0)
Arthritis (#)	93% (56)	90% (47)

Pre-operatively, 32 (53%) of women and 14 (27%) of men stated to be incontinent of urine. Of the incontinent subjects, 97% reported to leak urine with urgency (either pure urgency-related or mixed urinary incontinence). Immediately following their hip replacement surgery, 20 (18.0%) subjects changed continence status. In 17 (37.0%) of the subjects reporting pre-operative urine loss, the incontinence resolved. This finding was significant for women ($p=.003$). Of the incontinent women, 22% improved, while 2% of women who were continent prior to surgery developed incontinence. On the other hand, 3 (4.6%) previously continent subjects reported *de novo* incontinence. In men, changes in continence status were less pronounced, 8% improved, while 4% became incontinent ($p=.27$). Three months after surgery, only 9 of the 17 improved subject's maintained continence, while the 3 (2.7%) subjects with *de novo* incontinence continued to be incontinent. Other than gender ($p=.02$) there was no independent predictor for change in continence status. There were no significant differences in age, BMI, procedure time or hospital length between the continent and incontinent groups. Subjects with incontinence reported a lower quality of life on UDI6 than those without incontinence ($p<.0004$).

Interpretation of results

- Following hip replacement surgery, close to one out of five women with pre-operative urinary incontinence reported to be continent.
- This initial continence was not maintained for most subjects.
- Improved bladder control was not related to the subjects' ability to ambulate.
- Though men also reported changes in their continence status, these were not significant.
- The function of structures of the outer pelvis (hip joint) may affect the function of the organs of the inner pelvis (bladder). The mechanism of this interaction warrants further exploration.

Concluding message

Hip replacement surgery can impact on continence status. This impact is more pronounced in women than in men. For one in five women with pre-operative urgency related incontinence, the urgency symptomatically improved following hip replacement.

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HUMAN SUBJECTS: This study was approved by the RSRB#10015 and followed the Declaration of Helsinki Informed consent was obtained from the patients.