Changes in lower urinary tract symptoms following surgery for fractured neck of femur

Abstract

There is evidence to suggest that bladder control problems develop following fractured neck of femur and its subsequent management, yet there are scant data available on factors associated with change in continence status in this patient group. This baseline study aimed to examine the prevalence of, or changes to, existing bladder control problems in 74 patients undergoing surgical fixation of fractured neck of femur at 5 days and 12 weeks post-operatively and to explore the associated risk factors. Follow up data were obtained for 56 patients and significant changes to continence status were found.

Background

Short and long-term outcomes following surgery for fractured neck of femur have been well studied [1, 2, 3], but have, in the main, excluded symptoms of bladder dysfunction either as denovo symptoms or worsening of extant symptoms. Urinary incontinence is morbid [4], progressive [5], and costly [6]. Reducing the onset of, or changes to, lower urinary tract symptoms (LUTS) should be an important factor of best practice care following hip surgery.

There is evidence to suggest that surgery to repair hip fractures can induce or worsen bladder control problems [7, 8], but scant information is available relating to other changes to LUTS following surgery to repair fractured neck of femur.

Many factors contribute to the iatrogenesis of bladder control problems following fractured hip, including age, gender, comorbidities, length of time before arrival at hospital, mode of anaesthetic, length of time of the surgery, post-operative pain management, post-operative urinary retention and strategies to manage urinary retention such as the use of indwelling urinary catheters (IDC), and development of urinary tract infection (UTI) [9]. This study aimed to explore changes in bladder control symptoms and associated factors.

Pauline Chiarelli
*Senior Lecturer Physiotherapy**
Member of the **Australian & New Zealand Continence Journal** *Editorial Committee*

Julie Byles
Director Research Centre for Gender, Health, and Ageing
*School of Medicine and Public Health**

Lynne Parkinson
Senior Research Fellow - Research Centre for Gender, Health and Ageing
Director, Hunter Ageing Research
*School of Medicine and Public Health**

Richard Gibson
Research Academic (Biostatistics)
*School of Medicine and Public Health**

***Faculty of Health, University of Newcastle, NSW**

Researchers in the Faculty of Health at University of Newcastle are members of the Centre for Research in Gender, Health and Ageing.

Method

Ethical approval for this study was granted by both the University of Newcastle and the Local Area Health Service, Human Research Ethics Committees.

Study participants

Patients 60 years or older admitted to a non-metropolitan, tertiary referral, teaching hospital for surgical fixation of fractured hip were eligible to be included.

Patients were excluded if their cognitive status was impaired, or if their general medical condition was deemed not suitable. The nursing unit manager (NUM) was given the task to determine each potential participant's mental status using the Mini Mental State Evaluation where this was relevant [10]. Other exclusion criteria included persons who did not speak English, those admitted from high dependency care units (nursing home), those diagnosed with serious medical comorbidities, those who had a long-term IDC, and those who were profoundly deaf, as this precluded participation in the follow-up telephone survey.

To allow for optimum patient comfort and resolution of post-operative confusional states, participants were approached on their fifth post-operative day. Those agreeing to join the study were asked to complete a brief survey to ascertain pre-operative (baseline information) and post-operative information and were asked to provide permission for an audit of their hospital record (chart) and to be contacted for a follow up survey. The follow up telephone survey took place 12 weeks after surgery.

Measures

The research team considered that the survey instrument to measure LUTS needed to be sensitive enough to detect change in symptoms and not merely the presence of symptoms, and relevant to both genders. Because participants were elderly and had major surgery, a short survey was deemed most suitable. Since men and women were to be surveyed, it was decided to use the same validated survey instrument for both genders. In this pilot study we used questions from the Danish Prostate

Symptom Score DAN-PSS-1 [11] and a well validated incontinence severity score as used by Sandvik [12].

Participants were asked if they had been diagnosed as having had a stroke, Parkinson's disease, diabetes or high blood pressure, and they were asked to compare their fluid intake while in hospital with their usual intake, their experience of constipation and constipation management, whether they had sought help for any of their reported symptoms, and which healthcare professional they consulted.

A chart review was done to find factors thought to contribute to urinary incontinence and to provide details of surgical anaesthesia (drug, dose, delivery), the length of time taken for the surgery, post-operative pain management (drug, dose, delivery), episodes of urinary retention (amount retained, period of resolution), where urinary retention occurred in the post-operative period, the management strategies used (IDC, intermittent catheterisation, suprapubic catheterisation), and the symptomatology or diagnosis of UTI.

The follow up telephone survey used the same instrument as applied at baseline. Statistical analysis was undertaken using the SAS package (www.sas.com/technologies/)

Results

Overall there were 214 patients who underwent hip surgery within the study period. Of these, 142 were excluded as per the exclusion criteria described above. There were 74 patients in the baseline study; 56 of those patients were followed up at 12 weeks. Of those not included in the 12 week follow up, six people had died, three were too ill to participate and nine could not be contacted by telephone.

The mean and median ages were 81 and 80 respectively, with the oldest participant being 97 years old. A majority (83%) were female. Co-morbidities among the group included 39% diagnosed with hypertension, 24% diagnosed with diabetes, 10% had previously suffered a stroke and 4.1% diagnosed with Parkinson's disease.

Surgical procedures to repair the fractured hip included pin and plate or cannulated screw (72%) and total hip replacement (28%). There were four main modes of anaesthesia, including general anaesthetic (57%), general and regional anaesthesia (3%), spinal anaesthesia including morphine 5.8%, and spinal anaesthesia including fentanyl (4.3%).

Most participants (74%) had an IDC inserted during surgery and the shortest duration of catheterisation was 24 hours. Seven (10%) participants reported having urinary retention and had this recorded on their medical record. Interestingly, six of those participants who reported urinary retention were female.

Participants were asked to report their symptoms on a 4-point scale before surgery (baseline survey), after surgery, and again at 12 weeks post-surgery. These self reported symptoms were classified as storage, irritative and voiding symptoms respectively. Participants were asked to report on the extent to which each symptom was a problem, rating it on a 4-point scale ranging from "not a problem" to "a serious problem". The proportion of participants reporting a problem for each of the symptoms at the three time points is presented in Table 1.

All storage symptoms increased from baseline to 5 days post surgery and several of these had not returned to original levels after 12 weeks. Almost 42% of the study population reported urinary frequency, having to void three or more times a night

Table 1. Reporting of symptoms as a problem.

		Before surgery n=74		After surgery		12 weeks after admission n=55	
Symptom group	**Symptom**	**n**	**(%)**	**n**	**(%)**	**n**	**(%)**
Storage symptoms	Daytime frequency	2	(3.1)	18	(26)	2	(3.8)
	Night-time frequency	0	(0.0)	20	(32)	8	(15)
	Leakage on way to toilet	2	(3.4)	20	(31)	5	(9.4)
	Leakage with physical activity	1	(1.8)	8	(15)	2	(4.0)
	Leakage unprompted	0	(0.0)	1	(2.2)	1	(2.1)
Irritative symptoms	Burning-stinging	1	(2.1)	7	(14)	1	(2.0)
	Urgency	3	(5.3)	21	(36)	4	(7.8)
	Bladder fain	0	(0.0)	3	(6.7)	1	(2.0)
Voiding symptoms	Faltering stream	0	(0.0)	3	(6.0)	0	(0.0)
	Weak stream	1	(2.1)	2	(4.3)	1	(2.0)
	Initiation	0	(0.0)	3	(6.7)	2	(4.1)
	Retention	1	(1.4)	5	(6.8)	2	(3.6)

at 12 weeks, with 15% reporting that nocturia was a problem (Table 1). At 12 weeks, urine leakage with physical activity affected 13%, with only 4% perceiving that as a problem. Unprompted leakage was not reported prior to surgery; however, was persistent for one participant at 12 weeks and was perceived as a problem.

One patient reported they had an experience of urinary retention prior to their operation, five (6.8%) participants experienced urinary retention post-operatively and two participants reported urinary retention at the 12 week follow up.

Irritative symptoms also increased markedly at five days post admission; however, experiences of burning and stinging and bladder pain resolved to at least mild for all participants by Week 12. One participant reported mild burning and stinging and bladder pain to be a problem. Urgency, on the other hand, increased among participants during the 12 weeks, with 19–24% of study participants reporting this, and 7.8% perceiving urgency to be a problem. Since the 12 week follow up survey was a telephone survey, the persistence of UTI was not able to be measured.

Voiding symptoms were reported less frequently than storage symptoms; however, each aspect of this symptomatology demonstrated a sharp increase 5 days post surgery and remained elevated at 12 weeks. Intermittent stream was experienced by 11% of the study participants at 12 weeks, but no participant reported this as a problem. Similar small proportions reported weak stream (9.1%), initiation problems (hesitancy) (11%) and retention (3.6%), with very few participants perceiving these to be a problem.

There was an expected and significant change in the mobility status of patients at the 12 week follow up survey when compared with their pre-operative mobility status ($p < 0.00001$). However, mobility status was unrelated to continence status.

Discussion

While changes in continence status improved between the first survey at 5 days post-operative and the follow up survey 12 weeks later, the results of this study highlight that complete resolution of denovo symptoms, or return of continence status to pre-fracture levels of bladder control, did not occur.

While many studies inform the outcomes of surgery for fractured neck of femur, few studies include any mention of urinary incontinence as a measured outcome. There have been no prospective studies that have explored the issue of continence status following surgery for fractured neck of femur. One study of some relevance, Palmer *et al* [13], found that incontinence increased from 20% pre-operatively to 40% post-operatively. The prevalence of incontinence in community dwelling Australians of similar age has been previously estimated at 4.4% for males [14] and 35% for females [15]. In view of the prevailing exclusion criteria within this baseline study, participants in this study may be considered to be more robust in terms of their general health status. It seems reasonable to assume a greater impact of surgery for fractured hip on the continence status of the less robust patients excluded from this study.

Since the incidence of fractured neck of femur is estimated to double in the next 20 years [2], the impact of changes in continence status will be magnified concurrently. The results of this study indicate a need to develop and test a continence promotion intervention for elderly patients following surgery for fractured neck of femur.

Acknowledgements

This baseline study was funded by The University of Newcastle and the Hunter Medical Research Institute. Statistical assistance provided by Ian Robinson.

References

1. Beringer TRO. Mortality and morbidity after hip fractures. BMJ 1994; 308(6924):343.
2. Sanders KM, Nicholson G, Ugoni A, Pasco J, Seeman E & Kotowicz M. Health burden of hip and other fractures in Australia beyond 2000. Med J Aust 1999; 170:467-470.
3. Zuckerman JD. Hip fracture N Engl J Med 1996; 334(23):1519-1525.
4. Resnick N. Geriatric incontinence. Urol Clin North Am 1996; 23(1):55-74.
5. Grimby A, Milsom I, Mollander U, Wiklund I & Ekelund P. The influence of urinary incontinence on the quality of life of elderly women. Age Ageing 1993; 22:82-89.
6 Doran CM, Chiarelli P & Cockburn J. Economic costs of urinary incontinence in community-dwelling Australian women. Med J Aust 2001; 174:456-458.
7. Palmer M, Myers A & Fedenko K. Urinary continence changes after hip fracture repair. Clin Nurs Research 1997; 6(1):8-25.
8. Halm E, Magaziner J, Hannan E, Wang J, Silberzweig SB. *et al.* Frequency and impact of active clinical issues and new impairments on hospital discharge in patients with hip fracture. Arch Intern Med 2003; 163:107-112.
9. Cools H. Restriction of long-term indwelling catheterisation in the elderly. BJ Urol 1998; 58:683-688.
10. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. J Am Geriatr Soc 1975;23:433-441.
11. Hald T, Nordling J, Andersen JT, Bilde H, Meyhoff HH & Walter S. A patient weighted symptom score system in the evaluation of uncomplicated benign prostatic hyerplasia. Scand J Urol Nephrol 1991; 138:59-62.
12. Sanders KM, Nicholson GC, Ugoni AM, Pasco JA, Seeman E & Kotowicz MA. Health burden of hip and other fractures in Australia beyond 2000. M J Aust 1999; 170:467-470.
13. Palmer M, Myers A & Fedenko K. Urinary continence changes after hip fracture repair. Clin Nurs Research 1997; 6(1):8-24.
14. Avery J, Taylor A & Gill T. Incontinence in South Australia: prevalence risk and priorities, Population research and outcomes studies unit; South Australian Department of Health: Adelaide, 2004.
15. Chiarelli P, Brown W & McElduff P. Leaking urine - prevalence and associated factors in Australian women. Neurourol & Urodyn 1999; 18(6):567-577.