Prevalence and management of (non-fistulous) urinary incontinence in women following radical hysterectomy for early stage cervical cancer

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Summary

Objectives: 1) to determine the prevalence of urinary incontinence before and after radical surgical treatment for early cervical cancer, 2) to retrospectively analyse the outcome results following the investigation/treatment of incontinence in these women.

Patients and Methods: 27 women were studied prospectively by questionnaire prior to surgery and six weeks and three months after surgery (group 1). Seventy-seven women who were more than 12 months post-radical surgery were questioned directly at the follow-up clinic (group 2). Three hundred and two satisfactory responses were obtained to questionnaires sent to general practitioners of patients previously treated by radical surgery for early cervical cancer (group 3).

Results: 14.8% of women reported regular incontinence prior to surgery, and 48.1% and 29.6% of women, respectively, reported regular incontinence six weeks and three months after surgery; 31.2% of women also reported regular incontinence more than 12 months after post-radical surgery. Of the women in the 12-month post-radical surgery group, 16.6% had considered their symptoms of regular incontinence severe enough to attend their local practice for treatment and 14.6% (44 women) were referred for further management. In six of these 44 patients (13.6%), spontaneous resolution of incontinence occurred at varying intervals within the first 12 months following radical surgery. Twenty-four of the 44 women who were referred underwent urodynamic investigation. Of these 24 women, in 17 cases the diagnosis was genuine stress incontinence (GSI), of which, in seven cases (41%) GSI was the sole urodynamic abnormality. In six of these seven cases (85.7%), the women were cured or very greatly improved following treatment with either physiotherapy or surgery. However, only six of the remaining ten cases (60%) with coexistent abnormalities achieved this result. Patients with coexistent impaired bladder compliance showed the poorest result, as only two of the six cases (33%) achieved satisfactory improvement following treatment.

Conclusion: Non-fistulous urinary incontinence following radical pelvic surgery for carcinoma of the cervix despite being a common problem shows a significant spontaneous improvement rate within the first 12 months following surgery. Urodynamics should be a mandatory investigation in patients who complain of persisting problems thereafter. Subjective improvement rates for women with genuine stress incontinence alone are in excess of 85%, being comparable to those of women without any prior history of radical pelvic surgery.

Key words: Bladder dysfunction; Cervical cancer; Radical hysterectomy; Stress incontinence; Urodynamics.

Introduction

Urinary incontinence, either in the form of stress or urge or mixed incontinence is widely accepted as one of the major short-term and long-term complications following radical surgical treatment of cervical cancer and is estimated to be present in up to 26% of cases [1]. Other urinary complaints following radical pelvic surgery include loss of bladder sensation, partial or complete urinary retention, voiding by abdominal straining, urinary frequency and urgency [2-4]. Following improvements in survival after treatment for early cervical cancer in recent years, quality of life and the minimisation of treatment-related morbidity has now assumed greater significance.

In addition, although the investigation/management of incontinence in the general population has been more standardised in recent years, this is often not the case for women who have previously undergone radical treatment for cervical cancer [5, 6]. This is largely because of the frequent coexistence of additional urinary abnormalities including impaired bladder compliance, destrusor instability and sensory/motor bladder dysfunction.

Limitations in the current literature addressing the aforementioned issues provided the impetus for further investigation. In this study, we have aimed to determine information regarding the prevalence of urinary incontinence before and after treatment for early cervical cancer. In addition, we have aimed to determine outcome results following the investigation/treatment of incontinence in these women.

Table 1. — *Urodynamic findings in women with GSI.*

Urodynamic Findings	Number of Patients
GSI only	7
GSI & DI	1
GSI, DI & impaired compliance	1
GSI & impaired compliance	6
GSI & high residual urine volumes	1
GSI, impaired compliance & high residual urine volume	1
Total	17

GSI = genuine stress incontinence; DI = detrusor instability.

Patients and Methods

A questionnaire designed to assess urinary symptoms was administered prior to surgery to 30 consecutive patients admitted for radical hysterectomy and pelvic lymphadenectomy for early cervical cancer at the Northern Gynaecological Oncology Centre, Gateshead, UK. Urinary incontinence was defined as involuntary loss of urine during physical exertion and was considered regular when it occurred more than two times per month. The questionnaire was also re-administered when the patients attended for their six-week and three-month post-operative follow-up appointments (group 1).

The questionnaire was also administered in the follow-up clinic at the above department to 85 consecutive patients who were more than 12 months post-treatment following radical hysterectomy and pelvic lymphadenectomy for early cervical cancer (group 2).

A postal questionnaire was also sent to the general practitioners of 485 women who had previously undergone radical hysterectomy and pelvic lymphadenectomy at the above department. This questionnaire was to determine how many of the 485 patients treated had complained of urinary incontinence, and to determine what action, if any, had been taken, i.e. referral for investigation/treatment. The hospital records for patients in whom a positive response was obtained were selected and checked against those already identified following the review of follow-up records (group 3).

Results

Of the 30 women in group 1, three were excluded as they continued to have indwelling catheters in situ at the time of the six-week postoperative review. Of the remaining 27 women, four (14.8%) reported regular incontinence prior to surgery, and 13 (48.1%) and eight (29.6%), respectively, reported regular incontinence six weeks and three months after surgery.

Of the 85 patients in group 2 who were questione directly at the follow-up clinic and were more than 12 months following treatment, in 77 cases the questionnaires were adjudged complete; 24 of the 77 women (31.2%) reported regular incontinence.

Of the 485 questionnaires that were sent to the patients' general practitioners in group 3, 423 replies were received giving a response rate of 87.2%. Eighty-one of the 423 patients were excluded; 25 who had died during the intervening period, 18 who had changed residences since the time of treatment and whose records were no longer held by the

original practice, and 38 where the replies did not address the questions satisfactorily. Of the remaining 342 cases, 302 had been treated by radical surgery only, of which, 50 (16.6%) had complained of regular incontinence.

Of these 50 patients, 44 (14.6%) had been referred by the general practitioner for further investigation/treatment of incontinence. Of these 44 women, 39 were noted to have additional urinary symptoms at the time of referral including frequency, urgency, staining to void, impaired sensation of bladder fullness, sensation of incomplete emptying, recurrent infection, nocturia, hesitancy, post-micturition dribbling or poor stream.

Twenty-four of the 44 women referred for further management underwent urodynamic investigation of their urinary symptoms. Of these 24 women, 17 were diagnosed with genuine stress incontinence (GSI), of which, in seven cases (41%) GSI was the sole urodynamic abnormality. In the remaining ten cases (59%), there were secondary urodynamic abnormalities in addition to the GSI (table 1).

Table 2 outlines the reasons for not performing urodynamic investigations in the remaining 20 of the 44 patients referred for further management of urinary incontinence.

The various treatment offered to the 17 women with GSI as the main urodynamic abnormality and subsequent outcome results are shown in Table 3. A number of patients were offered a combination of treatments, either simultaneously or sequentially, in keeping with the urodynamic diagnosis/diagnoses. For example, some patients were offered physiotherapy in the form of pelvic

Table 2. — *Reasons for not performing urodynamic investigations.*

	Number
Urodynamic investigation not available at time of presentation	2
Symptoms improved with non-surgical treatment	7*
Awaiting urodynamics or undergoing non-surgical treatment prior to urodynamics	6
Patients declined urodynamic investigation	3
Patients lost to follow-up	2
Total	20

* = for 6 of the 7 patients, symptoms improved with non-surgical treatment within 12 months of radical pelvic surgery.

Table 3. — *Treatment of women with GSI.*

Treatment	No. Treated	RESULTS			
		Continent	Improved	No change	Defaulted
Vaginal Buttress	2	2	–	–	–
Stamey	1	–	–	1	–
Colpo-suspension	2	2	–	–	–
Physiotherapy	5	–	2	3	–
Drugs#	2	–	1	–	1
CISC	1	1	–	–	–
Drugs/Physio	1	1	–	–	–
CISC	1	1	–	–	–
No Treatment	1	1	–	–	–
Drugs/CISC	1	1	–	–	–

= Bethanechol was used in an attempt to improve bladder emptying; CISC = continuous intermittent self-catheterisation; Physio = physiotherapy.

Table 4. — *Treatment results according to urodynamic findings and presence of GSI.*

Findings	Treated	Cured/improved	No change	Defaulted
GSI only	7	6 (85.7%)	–	1
GSI & IC	6	2 (33%)	3	1
GSI & HRV	1	1	–	–
GSI, IC & HRV	1	1	–	–
GSI & DI	1	1	–	–
GSI, DI & IC	1	1	–	–

GSI = genuine stress incontinence; IC = impaired compliance; HRV = high post-micturition residual urine volume; DI = detrusor instability.

floor exercises whilst awaiting investigations. Once the diagnosis was made, treatment then continued in the form of further physiotherapy proceeding to surgery when it was clear that the benefits from physiotherapy had not been significant. Those patients with low bladder compliance with or without high post-micturition residual urine volumes were treated with bladder stimulants and clean intermittent self-catheterisation, either sequentially or in combination, in an attempt to alleviate symptoms prior to surgery.

Based on the patient's own subjective assessment and clinical findings at subsequent follow-up, 12 of the 17 patients (70.6%) were either continent (9 patients) or very much improved (3 patients) following treatment.

The outcome results for these 17 patients in relation to the coexistence of additional urodynamic abnormalities are shown in Table 4. Six of the seven cases (85.7%) with pure GSI only were cured or very greatly improved following treatment with either physiotherapy or surgery. However, only six of the ten cases (60%) with abnormal findings in addition to the GSI achieved this result. Patients with impaired bladder compliance showed the poorest result, as only two of the six cases (33%) achieved satisfactory improvement following treatment.

The urodynamic findings and outcome results of the remaining seven of the 24 patients not shown to have GSI by urodynamic investigations are shown in Table 5.

Table 5. — *Otucome for patients with urodynamic findings other than GSI.*

Urodynamic findings	No. of patients	Cured/improved	No significant improvement
HRV & IC	2	1 (treated with bladder stimulants)	1
IC only	1	1 (spontaneously by 6 months)	–
HRV only	1	1 (CISC)	–
No abnormality	3	2 (spontaneously by 12 months)	1

HRV = high post-micturition residual urine volume; IC = impaired compliance; CISC = continuous intermittent self-catheterisation.

Discussion

The two established methods of treating cervical cancer, surgery and radiotherapy have both been associated with significant lower urinary tract morbidity.

Radiotherapy may give rise to urinary frequency, nocturia, urgency and haematuria, and may ultimately give rise to a small capacity bladder. The effect of radical hysterectomy on bladder function appears to be the result of a combination of direct trauma to the bladder at the time of surgery, anatomic displacement following removal of the uterus and its supports, and damage to the pelvic nerves during dissection of the paravaginal web of tissue [7-10]. In the detailed investigation by Farquharson *et al.* [1], it is suggested that patients with preoperative evidence of an incompetent bladder neck may be predisposed to develop stress incontinence after radical hysterectomy because of a reduction in the urethral closure pressure.

The figure of 14.8% in this study for the prevalence of regular urinary incontinence prior to radical pelvic surgery appears similar to that reported in previously published population studies. Thomas *et al.* [11] reported a prevalence of 8.5% in women aged 15-64 years and 11.6% in women aged 65 years and over, whilst O'Brien *et al.* [12] reported a prevalence of 16.4% in women aged 35-64 years.

In this present study, the results suggest that although normal continence mechanisms may be disrupted at the time of radical surgery, some spontaneous recovery does occur during the short-term period. At six weeks, nearly half of the patients (48.1%) reported regular incontinence, with this figure dropping to just under a third (29.6%) at three months. This figure then appears to remain fairly consant (31.2%) as suggested from the results of patients who were more than 12 months following treatment. These results are in keeping with previously published data by Ralph *et al.* [13] who reported 20% of patients developing urinary stress incontinence following radical hysterectomy, and Farquharson *et al.* [1] who reported 26% of patients developing incontinence requiring protection following radical hysterectomy.

Of these women it appears that only about half actually seek medical advice/treatment for their incontinence as seen from the results of the survey of general practitioners, showing that only 16.7% of patients actually attended their local practitioner to report the presence of urinary symptoms. This figure, however, does not necessarily reflect the true prevalence of incontinence in this population, as these patients are a self-selected group.

It is already well established that even in women without any history of prior radical surgical treatment, a detailed enquiry into urinary symptoms followed by a thorough clinical examination may not necessarily lead to a correct diagnosis in women presenting with stress incontinence [14-16]. In the series of Jarvis *et al.* [15], in women without any prior history of radical pelvic surgery, only 30 of 41 women (73%) had urodynamic confirmation of genuine stress incontinence when compared with the clinical diagnosis. In the present series, a similar finding of 17 of 24 patients (70%) had a diagnosis of genuine stress incontinence confirmed on urodynamic investigation.

In addition, coexistent abnormalities were identified in ten of the 17 patients (59%) in whom a diagnosis of genuine stress incontinence had been made. In two of
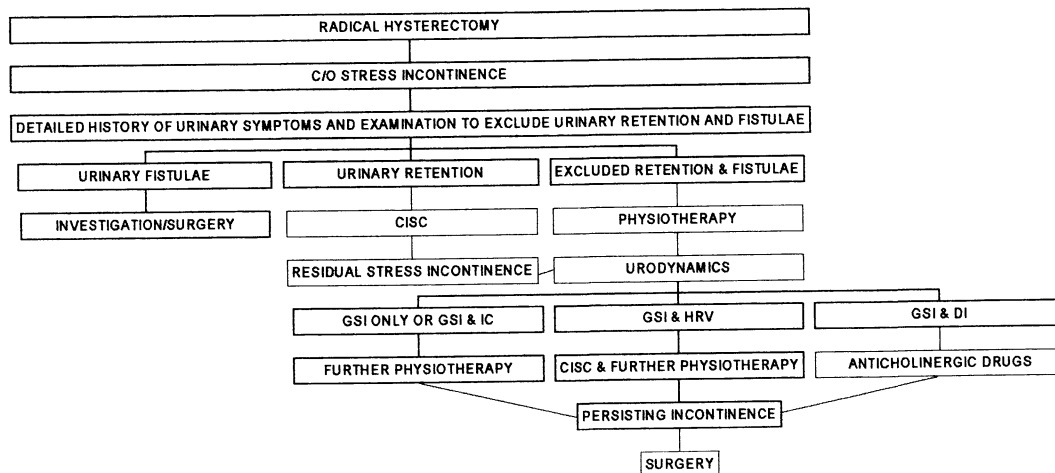
GSI = genuine stress incontinence.
DI = detrusor instability.

HRV = high post-micturition residual urine volume.
CISC = continuous intermittent self-catheterisation.

Figure 1. — Suggested flow chart for investigation and treatment of incontinence following radical hysterectomy.

these cases (11.8%), detrusor instability coexisted with genuine stress incontinence, a result which is almost twice that seen in the series by Jarvis *et al.* [15] where the two conditions coexisted in 6.6% of cases. A higher proportion of patients with coexistent abnormalities following radical pelvic surgery as seen in this series is similar to the results of Sekido *et al.* [17] who also recommended the routine use of urodynamic investigations in patients presenting with urinary incontinence following radical pelvic surgery because of compensating factors which often mask the urological symptoms.

Our results demonstrate that in spite of the previous radical pelvic surgery, patients suffering from GSI as an isolated urodynamic abnormality appear to have excellent prospects for cure with a subjective improvement rate of 85.7%. This subjective improvement rate appears to compare favourably with the improvement rates reported in patients with no prior history of radical pelvic surgery [18].

However, the presence of coexisting urodynamic abnormalities, particularly impaired bladder compliance, defined as a rise in detrusor pressure at full bladder capacity of > 15 cms of water above empty/resting pressure [19] appears to have a less favourable outcome following treatment, with a subjective improvement rate of only 33%. This result reinforces the recommended mandatory role of urodynamic assessment in the management of incontinence developing after radical pelvic surgery, as suggested by Fishman *et al.* [20]. This recommendation is not only to confirm the diagnosis of GSI but also to exclude the presence of coexisting abnormalities, thereby allowing an accurate prediction of outcome/cure following surgical treatment.

Patients with coexistent high post-micturition residual volume pose a particular problem with the potential risk of developing urinary retention following bladder neck suspension operations. In this series, attempts to manage high post-micturition residual volume prior to surgery

with cholinergic drugs such as Bethanechol were not successful, similar to that reported by Kadar *et al.* [5], and three patients required clean intermittent self-catheterisation (CISC) to ensure satisfactory bladder emptying.

Also, of interest, was that in six of the 44 patients (13.6%), spontaneous resolution of incontinence occurred at varying intervals within the first 12 months following radical surgery. It would appear logical therefore to persist with conservative non-surgical management of urinary stress incontinence for at least 12 months following radical pelvic surgery before embarking on surgical treatment.

The retrospective elements of this study and the use of three different patient cohorts clearly limit the strength of any major conclusion that can be made. However, considering the scaricity in the recent literature of investigation/management of this surgical complication, a proposed algorithm for the management of patients presenting with stress incontinence following radical surgery for early cervical cancer is suggested (Figure 1).

In conclusion, non-fistulous urinary incontinence following radical pelvic surgery for carcinoma of the cervix shows a significant spontaneous improvement rate within the first 12 months following surgery. Urodynamics should be a mandatory investigation in patients who complain of persisting problems thereafter. Subjective improvement rates for women with genuine stress incontinence alone are in excess of 85%, being comparable to those of women without any prior history of radical pelvic surgery.

Acknowledgements

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