

The Use of Intraoperative Cystoscopy by General Gynaecologists in Canada

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Abstract

Background: The primary purpose of this study was to determine the intraoperative cystoscopy practices of Canadian gynaecologists. The secondary aim was to identify barriers for the use of cystoscopy in this same population.

Methods: An 18-item questionnaire was sent to all active members of the Society of Obstetricians and Gynaecologists of Canada. The questionnaire included questions about basic demographic data and specific questions regarding cystoscopy use and barriers to use.

Results: The response rate was 23% (236/1006). Two hundred thirty-one respondents practised gynaecology, and, of these, 48% (111/230) used intraoperative cystoscopy routinely (16/111, 14%), selectively (84/111, 75%), or for other reasons (12/111, 11%), primarily during tension-free vaginal tape procedures. The respondents used cystoscopy with the following procedures: colposuspension (61%), vaginal hysterectomy (23%), vaginal vault suspension (21%), and culdoplasty (20%). Cystoscopy was most commonly performed transurethrally (73%) with a 30 degree cystoscope. Lack of training was the most common reason cystoscopy was not used (70/118, 59%). Increased physician age (RR 0.47; CI 0.38–0.59, $P < 0.01$) and duration in practice of more than 10 years (RR 0.62; CI 0.46–0.83, $P < 0.01$) was associated with significantly decreased cystoscopy use.

Conclusion: Intraoperative cystoscopy is used by a significant number of Canadian gynaecologists for the detection of lower urinary tract injuries during gynaecologic surgery. Lack of training is the primary barrier to use of cystoscopy, and increasing physician age and duration of practice > 10 years are associated with decreased use of cystoscopy.

Résumé

Contexte : Cette étude avait pour principal objectif de déterminer les pratiques des gynécologues canadiens en matière de cystoscopie peropératoire; son objectif secondaire était d'identifier les obstacles quant à l'utilisation de la cystoscopie au sein de la même population.

Key Words: Cystoscopy, gynaecologic surgery, urologic injury

Competing Interests: None declared.

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Méthodes : Nous avons fait parvenir un questionnaire en 18 points à tous les membres actifs de la Société des obstétriciens et gynécologues du Canada. Ce questionnaire comprenait des questions portant sur des données démographiques de base, ainsi que des questions précises quant à l'utilisation de la cystoscopie et aux obstacles à surmonter pour pouvoir l'utiliser.

Résultats : Le taux de réponse a été de 23 % (236/1 006). Deux cent trente et un répondants pratiquaient la gynécologie, et 48 % (111/230) d'entre eux utilisaient la cystoscopie peropératoire de façon systématique (16/111, 14 %), de façon sélective (84/111, 75 %) ou pour d'autres raisons (12/111, 11 %), principalement au cours des interventions faisant appel à des bandelettes vaginales sans tension. Les répondants faisaient appel à la cystoscopie dans le cadre des interventions suivantes : colposuspension (61 %), hystérectomie vaginale (23 %), suspension du dôme vaginal (21 %) et culdoplastie (20 %). La cystoscopie était le plus fréquemment menée par voie transurétrale (73 %) au moyen d'un cystoscope 30 degrés. Le manque de formation constituait la raison la plus courante pour laquelle la cystoscopie n'était pas utilisée (70/118, 59 %). L'âge avancé du médecin (RR, 0,47; IC, 0,38–0,59, $P < 0,01$) et une pratique dont la durée est supérieure à 10 ans (RR, 0,62; IC, 0,46–0,83, $P < 0,01$) étaient associés à une baisse significative de l'utilisation de la cystoscopie.

Conclusion : La cystoscopie peropératoire est utilisée par un nombre important de gynécologues canadiens, dans le cadre de la chirurgie gynécologique, aux fins de la détection des lésions affectant les voies urinaires inférieures. Le manque de formation constitue le principal obstacle à l'utilisation de la cystoscopie; de plus, l'âge avancé du médecin et une pratique dont la durée est supérieure à 10 ans sont associés à une baisse de l'utilisation de la cystoscopie.

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INTRODUCTION

The proximity of the ureters and bladder to the female reproductive organs makes gynaecologic surgery the main cause of lower urinary tract injuries in women.¹ Intraoperative recognition of these injuries can lead to immediate intervention, reduced morbidity, and better outcomes for the surgeon in litigation proceedings.^{2–5} In a review by Gilmour et al., the use of intraoperative cystoscopy led to the detection of 90% of unsuspected ureteric injuries and 85% of bladder injuries.⁶ While there is no consensus about the utility of routine intraoperative cystoscopy for general gynaecologic surgery, there is mounting evidence to support its routine use in anti-incontinence and

pelvic floor reconstructive surgery, where lower urinary tract injury rates have been reported to range from 1.6% to 11%.^{5,7-9}

The purpose of this study was to determine the extent of use of intraoperative cystoscopy by Canadian gynaecologists. Our secondary aim was to identify potential barriers to the use of cystoscopy in this group.

METHODS

In 2005, a survey was sent to all active members of the Society of Obstetricians and Gynaecologists of Canada. The 18-item questionnaire contained questions about demographic information, including age, sex, year of residency completion, province and type of practice, population served by the practitioner's hospital, and whether the respondent was in general or subspecialty practice. If the respondent's practice included gynaecology, the instructions were to complete the remainder of the questionnaire. Questions regarding cystoscopy use included whether the respondent used intraoperative cystoscopy at all, and if so, whether this use was routine, selective, or for another reason. Respondents who used cystoscopy were asked to identify the surgical procedures during which cystoscopy was used, the type and degree of endoscope used (0°, 30°, or 70° cystoscope, hysteroscope, or laparoscope), method of cystoscopy (transurethral, through a bladder stab, or both), and how they were trained in cystoscopy. Respondents not using cystoscopy were asked about barriers to their use of cystoscopy, including hospital policy concerning credentialing for cystoscopy. They were also asked whom they consulted when cystoscopy was required. Finally, respondents were questioned about their use of intraoperative ureteric catheters and who inserted the catheters.

This survey was initially sent out as a pilot to all members of the Atlantic Society of Obstetricians and Gynaecologists, membership approximately 60, as a screen for ease of use and to guide possible modifications of potentially ambiguous questions. The questionnaire was found to be satisfactory during this pilot survey.

The national questionnaire was included in a general information package sent out by the Society of Obstetricians and Gynaecologists of Canada. The questionnaire package included an information letter, the questionnaire itself, and a postage paid return envelope. The respondents also had the option of responding online via a urogynaecology survey website. All questionnaires were numerically coded to ensure respondent confidentiality. Ethical approval was obtained from the IWK Health Centre Research Ethics Committee.

Table 1. Demographic data

Demographic factor	Respondents, n = 236	%
Sex		
Male	146	61.8
Female	86	36.4
No response	4	1.7
Age (years)		
20–30	2	0.8
31–40	46	19.5
41–50	74	31.4
51–60	66	28.0
> 60	45	19.0
No response	3	1.3
Specialty		
General gynaecology	188	79.6
Urogynaecology	16	6.8
Gynaecologic oncology	15	6.4
REI	8	3.4
MFM	5	2.1
No response	4	1.7
Region of Canada*		
Atlantic	61	25.8
Central	102	43.2
Western	65	27.6
No response	8	3.4
Type of practice		
Private	144	61.0
University—PT	38	16.1
University—FT	43	18.2
No response	11	4.7
Population served by hospital		
< 50 000	20	8
50 000–100 000	55	23
101 000–150 000	28	12
151 000–200 000	13	6
> 200 000	133	56
No response	7	3

REI: reproductive endocrinology and infertility; MFM: maternal fetal medicine; FT: full time; PT: part time.

*Atlantic: Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island; Central: Ontario, Quebec; Western: Manitoba, Saskatchewan, Alberta, British Columbia.

Table 2. Indications for intraoperative cystoscopy

Procedure	Surgeons using cystoscopy with procedure n (%)
Colposuspension	68 (61)
Vaginal hysterectomy	26 (23)
Vaginal vault suspension	24 (21)
Culdoplasty	23 (20)
Laparoscopic hysterectomy	22 (19)
Abdominal vault suspension	19 (16)
Anterior colporrhaphy	18 (16)
Bilateral salpingo-oophorectomy	18 (16)
Abdominal hysterectomy	16 (14)
Operative laparoscopy	12 (11)

Chi-square analysis was used to compare groups where appropriate. A *P* value of < 0.05 was considered significant.

RESULTS

The response rate for the questionnaire was 23% (236/1006). Five respondents practised only obstetrics and completed only the demographic portion of the questionnaire, and two respondents provided incomplete questionnaires, leaving 229 fully completed questionnaires. One hundred eleven respondents (48%) used cystoscopy during gynaecologic surgery. One respondent used cystoscopy only for the investigation of hematuria. The demographic data of respondents are shown in Table 1.

Intraoperative cystoscopy was used routinely by 16 (14%), 84 (75%) used cystoscopy when a lower urinary tract injury was suspected, and 12 (11%) specified another type of use, with 11/12 using cystoscopy only for a tension-free vaginal tape procedure. Of the 111 respondents who used cystoscopy in some form, the majority (108, 96%) stated that they had hospital privileges for performing cystoscopy.

Of the 111 respondents who used intraoperative cystoscopy, 80 (72%) received training during residency, 10 (9%) were self-trained, eight (7%) were trained by urologists, seven (6%) were trained by urogynaecologists, five (4%) learned from a gynaecology colleague and one (1%) respondent did not indicate how he or she received their cystoscopic training. The most common indications for surgeons to use intraoperative cystoscopy are included in Table 2.

Cystoscopic technique varied amongst respondents. Eighty-two (73%) used only transurethral cystoscopy, 17 (21%) performed cystoscopy either transurethrally or through a bladder stab, and 13 (12%) did not respond. The breakdown of endoscope usage was as follows: the 30° cystoscope was used by 67 (60%) respondents, the

70° cystoscope by 58 (52%), the 0° cystoscope by 16 (14%), and a hysteroscope or a laparoscope was used by eight (7%).

The most common reason for cystoscopy not to be used by respondents was lack of training (70/118, 59%). Other reasons included lack of privileges (17/118, 14%), preference for other methods to detect lower urinary tract injuries (16/118, 13%), and uncertainty concerning the value of cystoscopy to detect these injuries (5/118, 4%). Ten respondents (9%) gave no reason for not using cystoscopy. When asked about the use of intraoperative ureteric catheters for detecting lower urinary tract injury, 99/229 respondents (43%) stated that they used this method. These ureteric catheters are most commonly inserted by urologists (81, 82%), with smaller numbers inserted by gynaecologists, general surgeons, urogynaecologists, and gynaecology colleagues. All respondents who did not use cystoscopy stated that they would consult a colleague to perform cystoscopy when an injury was suspected. Urologists are most commonly consulted for this purpose (106/118, 90%), followed by urogynaecologists (4/118, 3%), and general surgeons (2/118, 2%).

The relationship between demographic factors and cystoscopy use is shown in Table 3. Physicians who had been in practice for more than 10 years were significantly less likely to use intraoperative cystoscopy than those who had been in practice for 10 years or less (RR 0.62; 95% CI 0.47–0.83; *P* < 0.01). In subgroup analysis, general gynaecologists were less likely to use intraoperative cystoscopy than urogynaecologists (RR 0.47; 95% CI 0.38–0.59; *P* < 0.01), but, overall, subspeciality was not related to cystoscopy use. Province of practice, type of practice, population served by the hospital, and sex of the surgeon did not significantly affect intraoperative cystoscopy use.

DISCUSSION

The overall prevalence of urinary tract injury at benign gynaecologic surgery is low (0.33%).⁴ Rates of urinary tract injury vary with the type and complexity of the surgical procedure, from a low of 0.2% for a vaginal hysterectomy ± bilateral salpingo-oophorectomy to 3.1% for more advanced procedures and to 7.8% with laparoscopic hysterectomy.¹⁰ The use of intraoperative cystoscopy is associated with higher rates of intraoperative diagnosis of lower urinary tract injury. Detection of bladder injury without the use of cystoscopy is much more likely than the detection of ureteric injury. The cost-effectiveness of routine screening is unproven for simpler procedures such as hysterectomy but may be logical with more complex surgical procedures for pelvic prolapse and incontinence. If the medico-legal costs associated with undetected injury are considered, the

Table 3. Demographic factors in relation to cystoscopy use

Demographic factor	Cystoscopy use	No cystoscopy use	<i>P</i>
Sex			
Male	65	78	NS
Female	41	41	
Age, years			
20–30	2	0	< 0.01
31–40	29	15	
41–50	33	38	
51–60	29	34	
> 60	10	33	
Years in practice			
< 10 years	42	26	< 0.01
> 10 years	53	86	
Specialty			
General	81	102	0.06
Urogynaecology	14	1	
Gynaecologic oncology	4	4	
REI	6	10	
MFM	1	1	
Region of Canada*			
Atlantic	30	29	NS
Central	30	61	
Western	36	30	
Type of practice			
Private	66	75	NS
University FT and PT	39	42	
Population served by hospital			
< 50 000	13	7	NS
50 000–100 000	24	31	
101 000–150 000	10	16	
151 000–200 000	8	5	
> 200 000	49	60	

REI: reproductive endocrinology and infertility; MFM: maternal fetal medicine; FT: full time; PT: part time.

*Atlantic: Newfoundland, Nova Scotia, New Brunswick, Prince Edward Island; Central: Ontario, Quebec; Western: Manitoba, Saskatchewan, Alberta, British Columbia.

cost-effectiveness of routine intraoperative cystoscopy may be more reasonable.

In this study, just over one half of the respondents, the majority of whom were general gynaecologists, used intraoperative cystoscopy for the detection of lower urinary tract injury. Given the low incidence of urinary tract injuries in benign gynaecologic surgery, these numbers may be considered high.¹¹ Evidence suggests that incontinence and reconstructive pelvic surgery procedures are associated with higher rates of injury.^{10,12} The principal indications cited by the gynaecologists in our study included the more

complex surgical procedures such as vaginal vault suspension, and culdoplasty, and incontinence procedures such as colposuspensions and tension-free vaginal tape. These findings imply recognition on the part of the gynaecologist that more complex surgeries carry a higher risk of lower urinary tract injury.

Early recognition of lower urinary tract injury is important from a medico-legal perspective. Several studies have demonstrated that the use of preoperative criteria such as surgical history, prolapse state, menopausal status, and preoperative urinary tract evaluation have not prevented

operative injury.^{5,8,11} Gilmour and Baskett showed that 82% of cases of litigation concerning lower urinary tract injury involved a failure of intraoperative diagnosis.⁴ Eighty-two percent of cases in which there was intraoperative recognition of the injury resulted in favourable findings for the surgeon, as opposed to only 60% of cases when detection was postoperative.⁴

Cystoscopy has been shown to be a safe procedure when performed by gynaecologists, adding an average of only five to seven minutes to the operating time.¹³ The most common complication associated with cystoscopy is an increased rate of urinary tract infection.² The rate of false positive cystoscopy is quite low at 0.6%.⁵ The majority of intraoperative cases required relatively simple management (removal/replacement of sutures, repair of cystotomy), and in one study, 88% were managed by the primary surgeon.¹⁰ These findings may explain the relatively high rate of use of intraoperative cystoscopy in our study population.

In this survey, the principal barrier to the use of cystoscopy was lack of training. The association of increasing age and years in practice with less use of cystoscopy probably reflects changing gynaecological practice. Many practising gynaecologic surgeons were trained at a time when cystoscopy was not routinely included in the curriculum for gynaecology. The growing concern about litigation and the availability of gynaecologic subspecialists (urogynaecologists) has furnished both the impetus and the means to set up training programs for gynaecology residents. In the study by Hibbert et al., credentialing in cystoscopy was achieved for all gynaecology residents enrolled in a specific course during their residency, and resulted in all trainees receiving hospital privileges to perform cystoscopy.¹⁴ Such a program would overcome the major obstacles found in this study: lack of training and hospital privileges.

The use of other methods of detection of lower urinary tract injuries was common in our study population. These methods have typically included the use of bladder instillation of methylene blue dye, ureteric stents and gross intraoperative examination of the ureters and bladder. Seven percent of our population relies solely on these methods and 43% use ureteric stents. These methods are unlikely to detect injury reliably. The instillation of methylene blue evaluates only the bladder, and ureteric catheters assess only the ureters. In addition, the effectiveness of preoperative placement of ureteric catheters to prevent ureteric injuries has been refuted in a recent retrospective study.¹⁵ Their placement has been associated with direct urinary tract injury¹⁶ and requires advanced cystoscopic training. Visualizing ureteric peristalsis also does not ensure ureteric

patency. In the prospective study by Vakili et al., peristalsis persisted in five of six ureteric injuries.¹¹

This is the first study to examine the use of intraoperative cystoscopy for the detection of lower urinary tract injuries in a population of practising gynaecologists. The finding that just under one half of those who responded to the survey were comfortable in the use of cystoscopy is reassuring. However, there may be a reporting bias because those who use cystoscopy may have been more likely to complete the questionnaire, so our finding may be an overestimate of the prevalence of cystoscopy use. This study did not allow us to determine the proportion of gynaecologists using cystoscopy in a particular surgical procedure.

CONCLUSION

Intraoperative cystoscopy is a safe and effective method for the detection of lower urinary tract injury during gynaecologic surgery. In our survey of Canadian gynaecologists, 48% of those who responded used cystoscopy either routinely or selectively for the detection of lower urinary tract injury. Those who are younger and who have been in practice for less than ten years are more likely to use cystoscopy, and this is probably an indication of training in their residency. To achieve intraoperative detection and management of all surgical urinary tract injuries and to reduce the associated morbidity and medico-legal costs, it would be appropriate for residency programs to establish routine cystoscopy training.

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