Local tumour ablation for localized kidney cancer: Practice patterns in Canada

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Abstract

Introduction: Local tumour ablation (LTA) is a recommended option for the treatment of localized kidney cancer in nonsurgical candidates. We performed a survey to describe the practice patterns of this procedure in Canada.

Methods: An electronic survey was sent by email to all urologists registered to the Canadian Urological Association (CUA). Urologists were queried about general demographic information, LTA availability at their institution (and reasons for non-availability, if it was the case), as well as the type and context of LTA use.

Results: Overall, 103 individual responses were obtained (response rate of 19.5%). Of those, 58 (56.3%) had access to LTA at their institution. Urologists who had access to LTA were more likely to work at an academic institution (69 vs. 16%, p<0.001). Among individuals who did not use LTA, the main reasons were lack of staff, such as radiologists, who can assist and/or perform the procedure (64%); and lack of expertise with the procedure (62%). Among urologists who had access to LTA, percutaneous radiofrequency and cryoablation were the most commonly used (72% and 21%, respectively); however, urologists were rarely involved in those procedures (12%).

Conclusions: In this national survey, we found that a significant proportion of Canadian urologists did not have access to LTA. We also found that when LTA was performed, urologists were rarely involved in the procedures. Those findings represent significant areas for improvement in the access to LTA. The conclusions of this study are limited by the low response rate.

Introduction

Different management options are available in the treatment of small and localized kidney cancer for nonsurgical candidates.[1-4] Among those management options, LTA may be undertaken and, according to recent reports, provide adequate oncological outcomes.[5,6] Also, different LTA types of energy (for example, cryoablation, radiofrequency, or microwaves) and approaches (percutaneous, laparoscopic, or open) can be chosen depending on the institution's experience.

In the current Canadian context, information on LTA access and practice patterns is lacking. In order to address this void in the current literature, we performed a national survey among practicing urologists to assess current LTA practice patterns in Canada. Specifically, we sought to describe the current context of LTA use and to identify potential barriers to LTA access.

Methods

Starting in April 2015, a survey link was sent by email to all practicing urologists registered to the CUA via the association's email system. Specifically, 529 urologists were queried. To increase response rate, the email was sent a total of four times and two cash prizes were offered randomly among respondents. When there was more than one answer by the same individual, the first answer was kept. After the prize draw, all email and IP address were deleted to assure confidentiality.

The survey contained a total of six to 15 questions, depending of the urologists' answers. The survey's format was inspired by two recently published surveys on LTA in the U.S.[7,8] and consisted of three different sections. The first set of questions described the practice context of each urologist; for instance, hospital province, academic status, and partial nephrectomy volume per month were detailed. The second part assessed whether LTA was available at participants' centre. If LTA was not available at the respondent's centre, the respondent was asked to explain why. The third part focused on the type and context of LTA use among respondents. Specifically, information on the number of procedures per month, the type of energy and approach, the maximum tumor size amenable to LTA, the role of the urologists in percutaneous LTA, the type of imaging technology used, as well as biopsy type and timing were all recorded. Most questions were multiple choice, but open-ended questions were also used.

Results were shown in frequencies and proportions. Chi-square was used to assess potential differences among groups. Statistical analyses were performed using RStudio[7] (version 0.98). All test were two-sided and statistical significance was set to $p < 0.05$.

Results

Overall, 103 individual responses were obtained (response rate of 19.5%). Of those, 58 (56.3%) had access to LTA at their institution. General characteristics are available in Table 1.

Urologic surgeons who had access to LTA at their centres were more likely to work at an academic institution (69 vs. 16%, p<0.001) and more likely to have a high partial nephrectomy volume in their centre (52% vs. 13% with more than five partial nephrectomies per month, p<0.001). Interestingly, we did not record a statistically significant difference in the access to LTA among different provinces. It is of note that several provinces had too few respondents to perform meaningful analyses; six provinces and territories had less than five answers.

Among individuals who did not have access to LTA, the main reasons were lack of staff, such as radiologists, who can assist and/or perform the procedure (64%); and lack of expertise with the procedure (62%, Table 2). Moreover, several urologists (16%) stated they did not have enough funding and/or material resources at their institution to offer LTA. Of all participants, 11 % reported having access to LTA via referral to a nearby centre.

Table 1. Descriptive characteristics of 103 Canadian urologists, stratified according to LTA access

	No LTA (n=45)	LTA (n=58)	*p* value
Academic centre			<0.001
No	38 (84)	18 (31)	
Yes	7 (16)	40 (69)	
PN volume/month in centre			0.002
0–5	39 (87)	28 (48)	
6–10	5 (11)	21 (36)	
>10	1 (2)	9 (16)	
Province			0.08
Alberta	2 (4)	6 (10)	
British Columbia	7 (16)	10 (17)	
Manitoba	3 (7)	1 (2)	
New Brunswick	2 (4)	0 (0)	
Newfoundland and Labrador	2 (4)	1 (2)	
Northwest Territories	1 (2)	0 (0)	
Nova Scotia	1 (2)	1 (2)	
Ontario	24 (53)	21 (36)	
Quebec	3 (7)	15 (26)	
Saskatchewan	0 (0)	2 (3)	
Unknown	0 (0)	1 (2)	

LTA: local tumour ablation; PN: partial nephrectomy.

The remaining analyses focused on respondents who had access to LTA at their institution. All the characteristics of LTA experience are displayed in Table 3.

When urologists had to decide on the maximum tumour size amenable to LTA, 26% and 45% reported a cut-off of 3 cm and 4 cm, respectively. Regarding type of energy used at percutaneous LTA, 21% and 72% reported using percutaneous cryoablation and radiofrequency, respectively. At percutaneous procedures, only one urologist performed such treatments alone (2%). Conversely, most percutaneous LTA were performed by radiologists (88%), or both urologist and radiologist (10%, Table 4). Urologists seldom placed the ablation needle themselves at LTA (8%), or were rarely present during the procedure (10%). However, most urologists provided postoperative care of LTA patients (85%). Of urologists with access to LTA at their institution, 9% and 7% used laparoscopic cryoablation and radiofrequency, respectively.

Several observations were made regarding imaging and biopsy at LTA. LTA was commonly performed with the combination of computed tomography and sonography (43%), followed by computed tomography guidance alone (31%). At laparoscopic LTA, perioperative sonography was used at most institutions (86%).

Renal mass biopsy was performed at LTA at most institutions (84%). In 36% and 52% of the respondent institutions, the renal mass biopsies were done before or during the procedure, respectively.

Finally, core biopsy (69%), followed by the combination of core biopsy and fine needle aspiration (12%) were the most common procedures seen.

Discussion

LTA is a recommended treatment for localized kidney cancer in nonsurgical candidates.[1-4] However, little is known about current LTA practice patterns in Canada. In this light, we sought to examine those practice patterns among urologists.

We performed a national survey among all Canadian urologists registered to the CUA and found that a significant proportion of urologists (43.7%) did not have access to LTA at

Table 2. Description of reasons for the lack of access to LTA among Canadian urologists (N=45)

Reasons for lack of access to LTA	N (%)
Lack of sufficient data to prove efficacy of the ablation procedures	5 (11)
Lack of expertise to do the procedure	28 (62)
Lack of staff (interventional radiologist, etc.) who can assist and/or perform the procedure	29 (64)
Other	
Available at another centre via referral	5 (11)
Lack of funding/material to perform LTA	7 (16)

LTA: local tumour ablation.

Table 3. Description of LTA practice patterns among urologists who have access to LTA at their institution (N=58)

	N (%)
LTA volume per month	
0–5	48 (83)
>5	3 (5)
Unknown	7 (12)
Types of LTA energy and approach	
Percutaneous – Radiofrequency	42 (72)
Percutaneous – Cryoablation	12 (21)
Laparoscopic – Radiofrequency	4 (7)
Laparoscopic – Cryoablation	5 (9)
Microwave	2 (3)
Other	1 (2)
Maximum tumour size to consider LTA*	
2 cm	1 (2)
3 cm	15 (26)
3.5 cm	4 (7)
4 cm	26 (45)
5 cm	2 (3)
Unknown	10 (17)
Type of imaging used at LTA	
CT	18 (31)
CT + US	25 (43)
MRI	1 (2)
US alone	5 (9)
Unknown	9 (16)
Biopsy at or before LTA	
No	2 (3)
Yes	49 (84)
Unknown	7 (12)
Timing of biopsy	
Before the procedure	21 (36)
Day of the procedure	30 (52)
Unknown	7 (12)
Type of biopsy used	
Core biopsy	40 (69)
FNA	3 (5)
Both	7 (12)
Unknown	8 (14)

*If urologists described a range of tumour size, the largest tumour size was taken.
CT: computed tomography; FNA: fine needle biopsy; LTA: local tumour ablation; US: sonography.

Table 4. Description of urologist involvememt in percutaneous LTA (N=48)

	N (%)
Types of energy	
Cryoablation	12 (25)
Radiofrequency	42 (88)
Physician performing the procedure	
Radiologists	42 (88)
Urologists	1 (2)
Both	5 (10)
Urologists are in the room	5 (10)
Urologists place the needle	4 (8)
Urologists take care of the postoperative care	41 (85)

their institutions. Urologists who did not have access to LTA were more likely practicing at non-academic, small surgical volume centres. We recorded that the main reasons for the absence of access was the lack of staff (64%) or the lack of expertise (62%) to do the procedure. Also, several urologists (16%) did not have the financial and/or material resources at their institution to offer LTA. Those findings are worrisome, as they represent barriers to potential options of care.

This information can be seen as motivation to improve access to nonsurgical management of kidney cancer. For instance, emphasis should be placed on better funding this type of technology. Similarly, fellowship training should be encouraged. Despite lack of urological expertise with LTA, several urologists (11%) have access to LTA through referral to another centre. Such practice should be encouraged to maximise access to LTA in Canada.

We also found that urologists were rarely directly involved in percutaneous procedures. Specifically, urologists performed percutaneous LTA alone or with the radiologist in only 2% and 10% of percutaneous LTA, respectively. These results differ from the U.S. context, in which urologists are more likely to be actively involved. In a survey of U.S. academic institutions, Patel et al. found that 55% of urologists were involved in percutaneous LTA.[8] Potential use of laparoscopic LTA could reverse this trend by virtue of placing the technology in urologists' hands.

It is encouraging to see that most of the urologists' institutions perform renal bass biopsy at or prior to LTA (84%). Moreover, the core biopsy (alone or with combination with fine needle aspiration) is used in most cases (81%). Those findings parallel current Canadian guidelines and expert opinions, which strongly support the role of biopsy at or prior to LTA.[4]

Interestingly, 36% and 52% of patients undergo renal mass biopsy before or on the day of the procedure, respectively. Ideally, biopsy prior to the procedure could better guide the treatment choice. For example, renal masses with favourable histology could be observed instead of being subjected to LTA. However, use of pre-procedure biopsy requires an additional visit for the patient and includes administration of anesthesia. Consequently, institution-specific protocols should ideally be implemented to optimize patient management and treatment efficacy.

Our survey is not the first to address this topic in the North American context, but it is the first to focus on Canadian practice patterns.[8,9] In the most recent survey of American academic centres, Patel et al found that LTA was available at all academic centres (compared to 85.1% of academic centres in our study).[8] They also reported that most centres had access to laparoscopic cryoablation (83%) or laparoscopic radiofrequency (20%). This contrasts with low access rates to laparoscopic cryoablation (9%) or radiofrequency (7%) in Canada. The low access rates are surprising, as these treatments showed excellent oncological outcomes at ter-

tiary care centres.[5] The discrepancies between access and outcome further highlight the need for training and expertise acquisition, as well as implementation of healthcare pathways.

Our study is not without limitations. The main one resides in the low response rate (19.5%). This response is lower than the one reported by Bandi et al (62%)[9] and the one reported by Patel et al (52%)[8] in similar surveys from the U.S. However, in those cases, the survey was sent directly to all academic centres, thus not comprising other types of practices. In contrast, our survey was sent to all practicing urologists registered to the CUA, which render our results more generalizable. Moreover, our response rate parallels a previous Canadian survey on small renal masses, in which an 18% response rate was obtained.[10]

Nevertheless, our results should be interpreted with caution and cannot be extrapolated to all Canadian practicing urologists. It may also be possible that a response bias toward those who had access to LTA in their institution is operational. In this context, further studies are needed to confirm our findings.

Finally, since the survey was designed to be short and ensure optimal response rate, additional information on other types of nonsurgical management used (such as observation) were not evaluated. Despite those limitations, this report describes, for the first time, the actual LTA context in Canada and provides potential aims of improvement in the access to LTA.

Conclusions

In this national survey, we found that a significant proportion of Canadian urologists did not have access to LTA. We also found that when LTA was performed, urologists were rarely involved in the procedures. These findings represent significant areas for improvement in the access to LTA. The conclusions of this study are limited by the small response rate.

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