

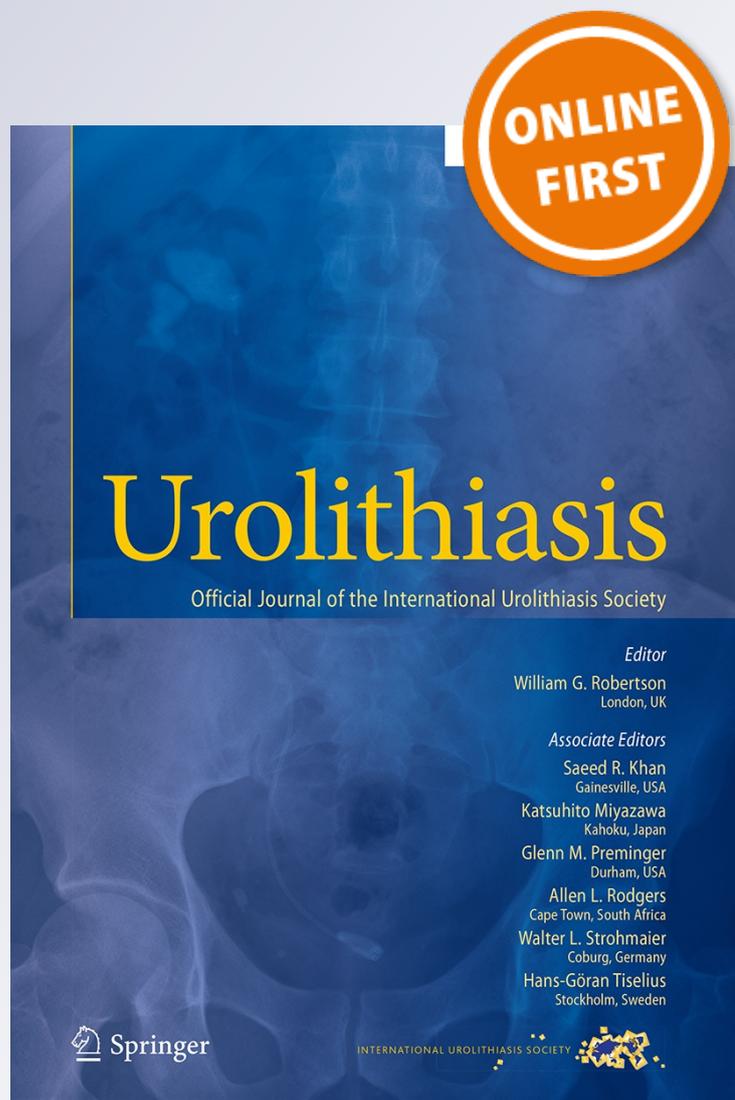
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Current practices in percutaneous nephrolithotomy in Mexico: results of a nation-wide electronic survey

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Abstract Practice patterns and choice of technological instruments in PCNL are not always standardized. There are no previous reports on the PCNL practice tendencies and patterns in Latin America. The aim of the study is to describe the current practice patterns of PCNL among the members of the Mexican Society of Urology (“Sociedad Mexicana de Urología”). Observational and descriptive study. A 9-item closed questionnaire on PCNL practice patterns was answered by members of the Mexican Society of Urology in a secure website hosted survey after e-mail invitation. A descriptive numerical and graphical analysis was performed. A total of 90 contestants were registered out of 492 potential participants. PCNL is performed by 80 % of the participants, with an average of 16 procedures per year. Percutaneous tracts are commonly obtained by urologists on the same day of the procedure. Sequential and telescopic dilators are equally preferred over balloons. The pneumatic litotripter is the most common choice and CT scan and X-ray are equally used as follow-up. The practice patterns of PCNL from Mexican urologists are different from other

international reports. Influence of socio-economic circumstances is inferred.

Keywords Percutaneous nephrolithotomy · Urolithiasis · Practice patterns · Minimally invasive surgery

Introduction

Percutaneous Nephrolithotomy (PCNL) is the treatment of choice for patients with large renal stone burden. It is recommended for renal stones >1.5–2 cm [1]. It has proved a reduction in morbidity and postoperative convalescence when compared to open surgery [2]. Since the first reported PCNL in the early 70 s [3], this technique has been continuously improved with the introduction of newer technologies. Computed tomography is used to plan the surgery and to assess residual fragments; ultrasound and fluoroscopy are available to guide percutaneous access [4]; and, a variety of endolithotripsy methods are now available [5].

Practice patterns and choice of technological instruments in PCNL are not always standardized. Controversy exists when deciding among older and newer technologies in an effort to improve results and decrease potential injury to the patients. As far as the authors are informed, there are no previous reports on the PCNL practice tendencies and patterns in Latin America.

Objective

The aim of this study is to describe the current practice patterns of PCNL among the members of the Mexican Society of Urology (“Sociedad Mexicana de Urología”), the largest national urological Society in Mexico, using a nation-wide survey.

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Materials and methods

An observational and descriptive study was proposed. The principles outlined in the Helsinki declaration were followed. It was approved by the ethics committee with the project number (URO-1594-15/15-1) and due to the nature of the study (anonymous professional survey) an informed consent was waived. A survey named *PCNL Technique Survey (ESTEN: Encuesta Sobre Nefrolitotomía Percutánea)* was created. It included 9 questions about current practice, as well as preferences on controversial decision making regarding the use of PCNL techniques and equipment. All questions were arbitrarily formulated based on the authors experience and interests. It was conceived as a short questionnaire in order to get the larger number of complete answers.

The complete contact database from the Mexican Society of Urology was used in order to send an e-mail invitation to all enlisted members, which included affiliated residents, fellows, and practicing urologists. They were asked to enter a secure website hosted survey (www.surveymonkey.com/s/ESTEN). The website remained open for 2 months (April and March, 2013). Participants accessed the site anonymously and no traceable data was collected. Each member was able to enter the site and answer the survey only once. Three reminder emails were sent weekly beside the original invitation.

The collected information was analyzed and synthesized using graphical and numerical descriptions.

Results

Four hundred and ninety-two emails were sent to an equal number of potential participants. Ninety members were registered as having responded to the survey, so an 18.3 % rate of participation was obtained. The final sample included 6 (6.7 %) Urology Residents, 46 (51.1 %) Urologists, 29 (32.2 %) Endourology Subspecialists, and 9 (10 %) Urologists with another subspecialty.

Seventy-two (80 %) participants affirmed that PCNL was performed by them in the previous year and 18 (20 %) did not. Figure 1 shows the frequency of participants that include PCNL in their daily practice according to academic training levels.

Two participants from the PCNL group did not answer the complete survey and were excluded from subsequent analysis.

In average, among the analyzed 72 participants, they reported to perform approximately 16 PCNL procedures per year. Figure 2 shows the average number of PCNL performed according to academic training.

The questionnaire included 6 further questions: (1) Is percutaneous access obtained by a radiologist or a

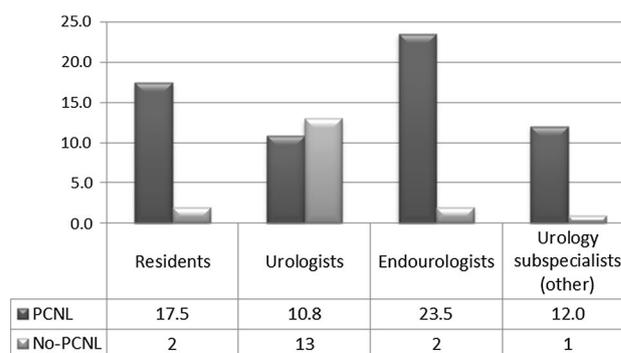


Fig. 1 Frequency of PCNL in daily practice

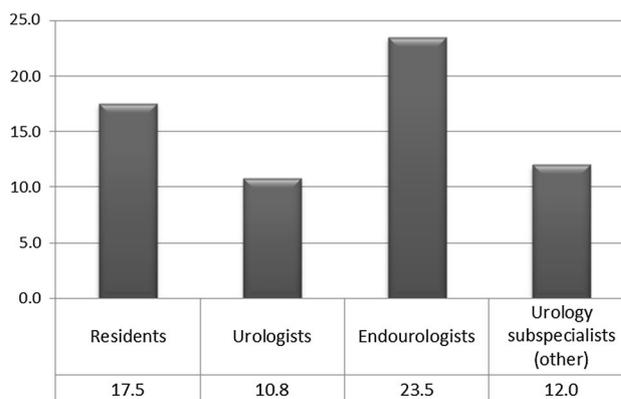


Fig. 2 Average number of PCNL procedures performed in the previous year

urologist? (2) Is the percutaneous access obtained the same day of the procedure or the previous day? (3) what image technique is employed for percutaneous access? (4) what kind of device is used for tract dilation? (5) what kind of instrument is used for endolithotripsy? And, (6) what image method is used to evaluate stone-free status after the procedure? The results are depicted in Figs. 3 and 4.

According to our surveyed population sample, most of the tracts are obtained by Urologists in Mexico, specially by endourologists; urologists and urologists with other subspecialties have a slightly higher tendency to seek support from radiologists regarding this issue. In general, most of the tracts are obtained the same day of the procedure. Fluoroscopy is the most common image method used to obtain a percutaneous access, but there is a significant percentage of Ultrasound users. Sequential and Telescopic dilators have a split preference among Mexican urologists with Balloon dilation used by a small percentage. Pneumatic endolithotripsy is the preferred method, although ultrasonic and laser technology have an increased preference among endourologists. Finally, abdominal plain x-ray images are still the most elected choice to ascertain stone-free status, and CT

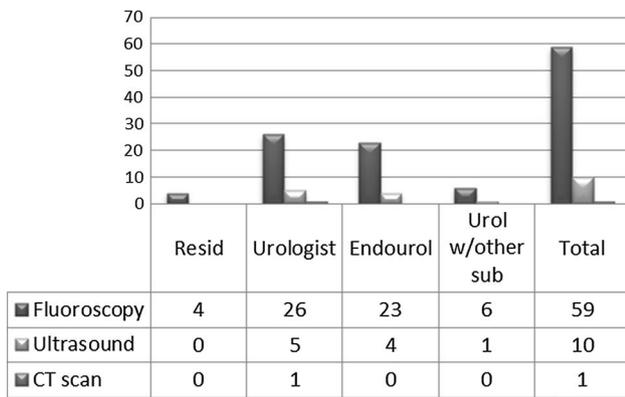
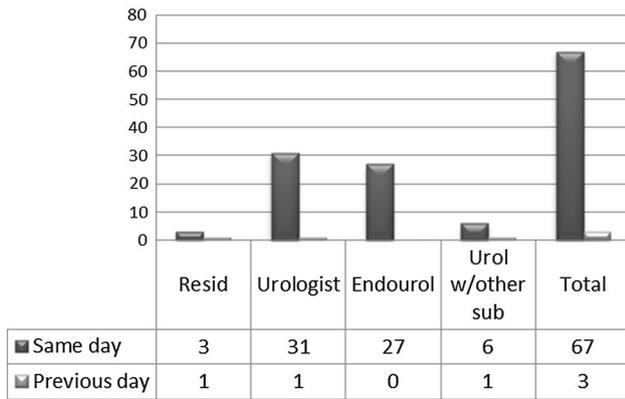
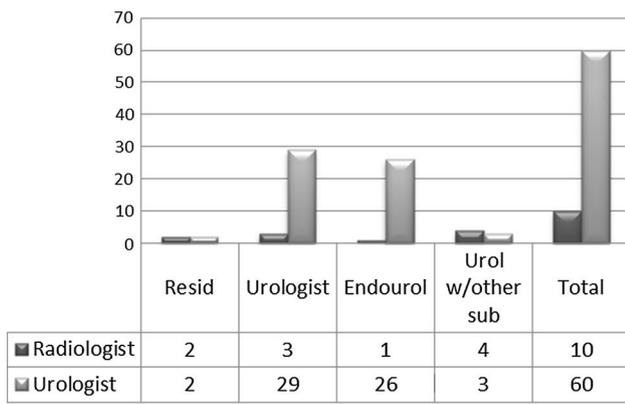


Fig. 3 Results from the survey. *Upper* who obtains the percutaneous access? *Middle* is the percutaneous access obtained the same day of the procedure or the previous day? *Lower* what image technique is employed for percutaneous access?

scan is a common method almost at the same level of preference to plain x-ray (Fig. 4).

Discussion

To our best knowledge, this is the first nation-wide survey in a Latin American country regarding practice patterns in PCNL. The unique socio-economic conditions of our nation

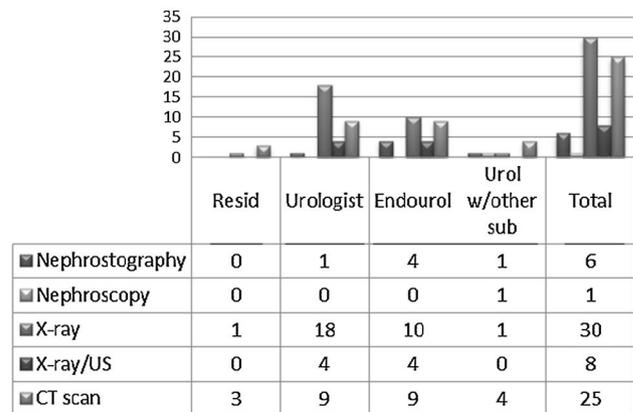
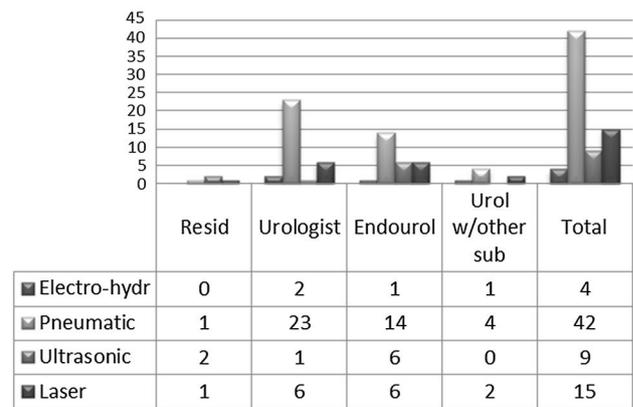
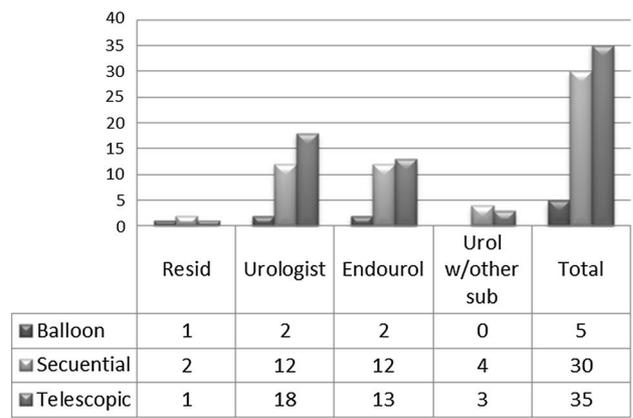


Fig. 4 Results from the survey. *Upper* what instrument is used for tract dilation? *Middle* what endolithotripsy method is used? *Lower* what image method is used to evaluate stone-free status?

in comparison to more developed regions of the world justify the endeavor to obtain local information in order to establish valid conclusions, which can lead to modifications in training/education trends or allocation of resources.

There is a general scarcity of data available from other parts of the world, however, there is some information that can be used to compare and contrast our findings.

The European Society of Uro-technology (ESUT) surveyed participants of the 2002 annual EAU meeting in

Table 1 Practice patterns comparing access, image puncture, tract dilatation, and endolithotripsy between ESUT, BAUS, and Endo-society surveys

Practice pattern	ESUT (%) <i>n</i> = 695	BAUS (%) <i>n</i> = 987	Endo-society (%) <i>n</i> = 293	ESTEN (%) <i>n</i> = 90
Access				
Radiologist	–	38	16	14
Urologist	–	62	76	8
Image for puncture				
Fluoroscopy	–	68	–	84
Ultrasound	–	3	–	14
Fluoroscopy and ultrasound	–	29	–	–
CT scan	–	0.1	–	2
Tract dilation				
Balloon	30	48	–	7
Sequential	30	5	–	43
Telescopic	–	47	–	50
Endolithotripsy				
Ultrasound	–	42	–	13
Pneumatic	–	31	–	60
Laser	–	6	–	21

Geneva [6]. Their survey included participants from all over the world, but their sample was mainly composed from European countries. It included 21 % of residents in training with the rest being Staff or Chief urologists. Seventy percent of the participants performed PCNL with an average of 16.8 procedures per month. Yet a wide difference in practice volume was found, with only 16 procedures per year in our data. This might reflect the small number of large concentration and referral centers in our country. It is a very important issue because it has been suggested that high-volume centers have lower medical costs and shorter length of stay after PCNL [7].

In our country, newer technologies are not widely available, mainly because of tight economic resources and/or the relatively reduced number of referral and academic centers currently operating. Kim et al. found that most of these centers tend to have access to technologies, such as ultrasonic lithotripter or Holmium laser generators, for example as in the U.S. [8].

Most of the literature from Europe and the U.S. concur with the present report that fluoroscopy is the image that most of urologists use to gain a percutaneous access in our regions. Ultrasound is another method that has been reported for puncture guidance [9], but it is rarely used in our country. CT scan is usually only used for percutaneous nephrostomy insertion; however, one urologist reported its use as the preferred method. New technology will be available in the future, for example rotational fluoroscopy, where the fluoroscopy C-arm makes a 180° rotational arc around the patient and 3-D reconstructed images can be obtained [10]. New ultrasound technology like 3-D or live 4-D images have been reported and represent a potential

improvement in this technique to be used in percutaneous renal punctures [11].

After a literature search, we found 3 papers amenable to comparison with our data, the ESUT survey [6], a registry from the British Association of Urological Surgeons [12], and a survey from the Endourological Society [13]. Their results are depicted in Table 1. The British registry is not a survey, but the gathered data are amenable for comparison. When comparing the 3 reports we can conclude that Urologists tend to gain access on their own, although a considerable 14–38 % work with a radiologist. Fluoroscopy is the preferred method for percutaneous renal puncture, followed by ultrasound. The use of balloon dilation is more commonly used in Europe, especially in the United Kingdom, although sequential and telescopic dilators are still widely used; Mexican urologists generally use both types of manual dilators. Finally, the use of Ultrasound endolithotripsy is used by almost half of the urologists in England, however, Pneumatic endolithotripsy is still used by a third of them; two-thirds of Mexican urologists use this technology.

No reports about stone-free status practice patterns were found in our literature search. However, abdominal x-ray is still the preferred evaluation method in our country. Despite this tendency, CT scan is gradually gaining preference.

Our study provides novel information about a scarcely investigated subject. It is the first report of PCNL practice patterns in Mexico or Latin America, and despite the limited number of questions included, it provides insight into the prevalent conditions of this region of the world. The authors believe it covers most of the relevant issues regarding controversial decision making for PCNL. Furthermore, it gives a broad scenario of PCNL practice trends, from the procedure

technique to postoperative care and follow-up; previous reports cover only isolated aspects. Our sample is nested in the largest Urological Society in Mexico and our response rate percentage is comparable to previous similar surveys.

Conclusions

Scarce information regarding practice patterns in PCNL is available. The choices from Mexican urologists are different from other international reports, probably due to socio-economic circumstances. More research in this field is required.

Conflict of interest The authors declare no conflict of interest.

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