

Translational Research Urology

Home page: www.transresurology.com

Editorial

Measuring Stone Free Rate after Mini Percutaneous Nephrolithotomy: Radiography, Ultrasound, or CT scan?

Ali Mohammad Fakhri Yasseri¹, Diana Taheri^{2*}

¹*Urology Research Center, Tehran University of Medical Sciences, Tehran, Iran*

²*Department of Pathology, Isfahan Kidney Diseases Research Center, Isfahan University of Medical Sciences, Isfahan, Iran*

HIGHLIGHTS

- Stone free rate (SFR) after several treatment strategies usually checked by plain radiography and ultrasonography, or computed tomography (CT) scan.
- The CT scanning is the preliminary testing method for SFR estimation after PCNL (percutaneous nephrolithotomy) due to its high sensitivity and wide availability.
- The CT scan is a suitable test after minimally invasive PCNL (MPCNL).

ARTICLE INFO

Receive Date: 07 April 2020

Accept Date: 10 May 2020

Available online: 26 May 2020

DOI: 10.22034/TRU.2020.253733.1035

*Corresponding Author:

Diana Taheri

Email: diana1380@yahoo.com

Address: Department of Pathology, Isfahan Kidney Diseases Research Center, Isfahan University of Medical Sciences, Isfahan, Iran

ABSTRACT

Stone free rate (SFR) after treatment can be estimated by plain radiography and ultrasonography, or computed tomography (CT) scanning. Based on the guidelines, CT is the primary method for SFR estimation after PCNL (percutaneous nephrolithotomy) due to its high sensitivity and wide availability. However, there is an extreme need to minimize unnecessary radiation exposure in patients. The CT scanning is more indispensable in the minimally invasive PCNL (MPCNL) technique to detect small residual stone fragments. Finally, we believe that using CT scan in follow up of MPCNL patients, rather than plain radiography and ultrasonography, is more accurate to detect residual fragment and estimate SFR as one of the important outcomes of this operations.

Keywords: Stone Free Rate; Percutaneous Nephrolithotomy; Nephrolithotomy; Paediatric Renal Stones

Editorial: Stone free rate (SFR) after stone treatment modalities is the main endpoint of many research. This variable is used for comparing the outcomes of a variety of articles. It could be measured by plain radiography and ultrasonography, or computed tomography (CT) scan. The miniaturized percutaneous lithotomy (MPCNL) is a new technique in the management of renal stones. This technique has achieved acquiring recently to increase

operational morbidity with acceptable results. Smaller Amplatz sheaths (usually 16-20 Fr) are used for MPCNL instead of conventional 20-30 Fr Amplatz sheath to have less damage to the renal parenchyma. Advantages of this technique are lower morbidity, less blood loss, decrease the need for analgesics, and shorter hospital stays (1). When it comes to stone-free rate (SFR) measurement, we believe that using plain radiography and ultrasonography

for this estimation is not sufficient and it is considered an old method. Pearle and co-workers in 1999 proved that computed tomography (CT) scan have 100% sensitivity for detecting residual stones after PCNL, by evaluating 36 patients with both flexible nephroscopy and CT scan (2). In 2020, the Campbell-Walsh urology textbook mentioned that CT scan is the primary method for evaluation of residual stone fragments after PCNL due to its high sensitivity and wide availability. But, there must be a balance with the need to minimize unnecessary radiation exposure in patients (3).

On the other hand, regarding MPCNL, some studies showed that the actual SFR after MPCNL might be overestimated, when relying only on the ultrasound or X-ray. Because CT scan achieved the highest sensitivity (93%) and specificity (97%) for the detection of kidney stones (4). Some authors define residual stones after MPCNL as larger than 3 millimeters, which cannot be detected by ultrasonography (5). Although we know that there are some concerns about radiation exposure in children using CT scans, we believe that small stone fragments after MPCNL are not vividly visible in ultrasound or x-ray. Thus, performing a CT scan is more indispensable in the MPCNL technique to detect small residual stone fragments.

Conclusions

We believe that using CT scan in follow up of MPCNL patients, rather than plain radiography and ultrasonography, is more accurate to detect residual fragment and estimate SFR as one of the important outcomes of this operations.

Authors' contributions

AMFY and DT contributed equally. Both authors reviewed and approved the final version of the manuscript.

Acknowledgments

Special thanks to Urology Research Center, Sina Hospital, Tehran University of Medical Sciences.

Conflict of interest

Both authors declare that there are no conflicts of interest regarding the publication of this manuscript.

Funding

The authors received no financial support for this research.

Ethical statement

Not Applicable.

Data availability

Not Applicable.

Abbreviations

| | |
|-------|-------------------------------------|
| CT | Computed tomography |
| MPCNL | Miniaturized percutaneous lithotomy |
| PCNL | Percutaneous nephrolithotomy |
| SFR | Stone free rate |

References

1. Mahmood SN, Aziz BO, Tawfeeq HM, Fakhraddin SS. Mini-versus standard percutaneous nephrolithotomy for treatment of pediatric renal stones: is smaller enough? *Journal of pediatric urology*. 2019;15(6):664. e1- e6.
2. Pearle MS, Watamull LM, MULLICAN MA. The sensitivity of non-contrast helical computerized tomography and plain film radiography compared to flexible nephroscopy for detecting residual fragments after percutaneous nephrolithotomy. *The Journal of urology*. 1999;162(1):23-6.
3. Partin AW, Wein AJ, Kavoussi LR, Peters CA, Dmochowski RR. *Campbell Walsh Urology, E-Book: Elsevier Health Sciences*; 2020.
4. Xiang H, Chan M, Brown V, Huo YR, Chan L, Ridley L. Systematic review and meta-analysis of the diagnostic accuracy of low-dose computed tomography of the kidneys, ureters, and bladder for urolithiasis. *Journal of medical imaging and radiation oncology*. 2017;61(5):582-90.
5. Kokov D, Manka L, Beck A, Winter A, Gerullis H, Karakiewicz PI, et al. Only Size Matters in Stone Patients: Computed Tomography Controlled Stone-Free Rates after Mini-Percutaneous Nephrolithotomy. *Urologia Internationalis*. 2019:1-6.

Author (s) biosketches

Fakhr Yasseri A.M., MD., Urology Research Center, Tehran University of Medical Sciences, Tehran, Iran.

Email: yasseri_2006@yahoo.com

Taheri D., Professor., Department of Pathology, Isfahan Kidney Diseases Research Center, Isfahan University of Medical Sciences, Isfahan, Iran.

Email: diana1380@yahoo.com

How to cite this article

Fakhr Yasseri A M, Taheri D, Measuring Stone Free Rate after Mini Percutaneous Nephrolithotomy: Radiography, Ultrasound, or CT scan?. *Translational Research In Urology*. 2020 May; 2(2): 48-50.

DOI: [10.22034/TRU.2020.253733.1035](https://doi.org/10.22034/TRU.2020.253733.1035)

URL: http://www.transresurology.com/article_119265.html

