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Editorial

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

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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).

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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.

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Conflict of interest

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Ethical statement

Not Applicable.

Data availability

Not Applicable.

Abbreviations

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

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