

# Management of lower pole renal stones: the devil is in the details

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**Abstract:** Shock wave lithotripsy (SWL), retrograde intrarenal surgery (RIRS) and minimally invasive percutaneous nephrolithotomy (MIP) are highly effective treatment options for lower pole stones up to 2 cm. Selecting the best treatment modality represents a controversial area in urology, because each treatment methods have their own advantages and disadvantages. Donaldson and co-workers have recently published a very comprehensive review and meta-analysis to compare the benefits and harms of SWL, RIRS and PNL techniques.

**Keywords:** Lower pole; renal stone; treatment

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Common and widely used treatment options for lower pole renal stones (LPS) include shock wave lithotripsy (SWL), retrograde intrarenal surgery (RIRS), and percutaneous nephrolithotomy (PNL). Selecting the best treatment modality for stones smaller than 2 cm represents a controversial area in urology, because each treatment methods have their own advantages and disadvantages (1). SWL is a minimally invasive technique and it is usually the first choice method because of good patient tolerance and low complication rate. However, it is associated with lower success rate and higher retreatment rate (2). At the same time, with the advances in endourological instrumentation and technology, RIRS and minimally invasive percutaneous nephrolithotomy (MIP) have become more increasingly considered options for the treatment of medium sized LPS (3,4).

Donaldson and co-workers have recently published a very comprehensive review and meta-analysis to compare the benefits and harms of SWL, RIRS and PNL techniques in the treatment of medium-sized ( $\leq 2$  cm) LPS in adults (5). Twelve articles reporting on 7 randomised controlled trials (RCTs) recruiting a total of 691 patients were included in this meta-analysis. Stone-free rate favoured PNL (96.3%) over RIRS (91.7%), and over SWL (54.5%). Stone size subgroup analyses revealed PNL and RIRS were considerably more effective than SWL for  $>10$  mm stones, but the magnitude of benefit was markedly less for  $\leq 10$  mm stones. The major limitation of this review was the paucity of evidence for the comparison of PNL *vs.* RIRS and the lack of reliable

evidence concerning outcomes other than stone-free rate (including complications, length of stay, analgesic requirement, and quality of life).

The European Association of Urology 2015 guidelines, state clearly that renal stones for 1–2 cm in diameter can be managed with SWL or endourological interventions (6). There is a decrease in the application of SWL with a parallel increase use of RIRS and MIP techniques due to better stone-free rate. In a recent meta-analysis, De *et al.* demonstrated that RIRS technique provides higher stone-free rates, shorter hospital stay, and reduced bleeding when compared with MIP for intermediate-sized (1–2 cm) renal stones (7). In another study, El-Nahas and colleagues showed significantly higher stone-free rate in RIRS (86%) compared with SWL (67%), whereas the complication rates were 4% in SWL and 13% in RIRS for lower pole stones 1 to 2 cm (8).

In the RIRS technique, laser energy can fragment all stones regardless of stone characteristics and patient's body mass index (9). But success of SWL can be affected by various factors such as stone density, body mass index, stone composition and lower pole anatomy. However, Resorlu *et al.* reported that the success of RIRS is also affected by infundibulopelvic angle (IPA) of lower pole (10). Therefore, MIP can be selected as a first treatment option for lower pole stones with narrow IPA, because its stone-free is not dependent on anatomic features.

Surgeon experience, available instrumentation and the

patient's preference are the another important factors for selection of procedure (11). Therefore patients should be informed preoperatively about the advantages and disadvantages of these techniques.

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