

Stone-breaking and retrieval strategy during retrograde intrarenal surgery

During the last 2 decades, the role of retrograde intrarenal surgery (RIRS) has markedly expanded as an advanced treatment modality for urinary calculi. RIRS is now considered as a first-line treatment of renal stones sized less than 20 mm regardless of stone location, stone composition, or renal anatomy because of high success rates and low morbidities [1,2].

The stone-breaking and retrieval method is one of the most interesting aspects of RIRS. Traditionally, stone retrieval with a basket after fragmentation of the stone into smaller extractable pieces was accepted as the standard step during RIRS. However, as the indication for RIRS has expanded to large and complicated stones, several technical modifications have been made to enhance the time-efficiency and surgical outcomes of RIRS. Now the term *dusting* is popularly used in stone surgeries such as RIRS and minimipercutaneous nephrolithotomy. There is no clear definition of dusting, but it generally means fragmenting stones into tiny pieces or a fine powder to eliminate the necessity for stone retrieval. To realize optimal dusting, a laser setting with a low pulse power energy (0.2–0.5 J) is essential. A low pulse power laser tends to grind the stone finely rather than into large pieces because the stones are mostly broken by photothermal effects rather than by shockwave effects [3].

Although the concept of dusting in RIRS was only recently established, this technique has rapidly become popular. A recent study demonstrated interesting data as a result of a global survey. Two-thirds of more than 400 surgeons from 44 countries responded that they had already used the dusting technique during RIRS [4]. However, clinical data on whether this technique is superior to the traditional fragmentation and retrieval technique are still limited.

The quality of dusting during RIRS can be affected by several factors such as stone composition, stone size, and

pelvocalyceal anatomy. Dusting is much easier when the stone is softer and smaller. Uric acid stones typically tend to be broken to fine dust regardless of laser power. When the stone burden is large, dusting via a popcorn-effect can be utilized for efficient fragmentation. However, when the infundibulum is wide and the calyx is huge, the whirlpool phenomenon, which is essential for the popcorn-effect, is not generated well.

In this issue of *Investigative and Clinical Urology*, interesting data are introduced by Lee et al [5]. Although the current study was performed retrospectively, this study provides valuable data about the surgical outcomes of the fragmentation only technique in a comparative study. The authors performed the active stone removal technique for the initial 172 consecutive patients and the dusting or fragmentation only technique for 76 later consecutive patients without active stone removal. They showed that surgical outcomes including operation time, success rate, and complication rate in the fragmentation only group were comparable to the outcomes in the active removal group. However, superiority of the fragmentation only technique over active removal was not demonstrated. Lack of data about the stone-free rate was a limitation of this study. Although spontaneous passage is generally expected after successful dusting, residual fragments sometimes lead to clinically significant problems including pain, obstruction, and regrowth [6,7].

Dusting is a very attractive method for stone surgery. However, this method is not always superior to the active removal method in various situations. For instance, if there is a small, hard stone that can be divided into several pieces without residual dust, such a stone is a good candidate for the active removal technique. It should be noted that the final goal of stone surgery is to remove the stone burden as much as possible and to reduce the risk of recurrence and

stone-related complications. The choice of stone-breaking and extraction method should be a means to achieve a surgical goal rather than an objective. If we have a chance to remove the entire stone burden without residuals by use of a basket, there is no reason we may not choose this better way.

CONFLICTS OF INTEREST

The authors have nothing to disclose.

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