available at www.sciencedirect.com
journal homepage: www.europeanurology.com

European Association of Urology

Platinum Priority – Editorial

Referring to the article published on pp. x-y of this issue

Miniaturized Percutaneous Nephrolithotomy: A Decade of Paradigm Shift in Percutaneous Renal Access

Mahesh R. Desai, Arvind P. Ganpule *

Muljibhai Patel Urological Hospital, Nadiad, India

The last decade has seen a paradigm shift from conventional percutaneous nephrolithotomy (PCNL) to PCNL with a tract size as small as 4.8 Fr. This validates the prophetic statement made more than a decade ago: "I would hope that in the future, our therapies will heal absolutely and harm not at all... and so let us continue to move, from knife to cannula to needle to nothing" [1].

In the well-written systematic review by the European Association of Urology Urolithiasis Guidelines Panel in this issue of *European Urology*, the authors conclude that miniaturized PCNL (miniperc, ultraminiperc, microperc) is as efficacious and safe as conventional PCNL with acceptable complications. They also note that the contemporary indications for miniaturized PNL are medium stones of up to 20 mm, although there are no credible data to support an upper limit for stone size. In addition, a few specific indications mentioned for miniaturized PCNL include stones in diverticula and stones in spidery collecting systems. This review notes the indications for extracorporeal shockwave lithotripsy and flexible ureteroscopy versus miniaturized PCNL. However, in this subset of patients it would be a matter of debate to define the role of each of these modalities [2].

As noted in the review, there is an inverse relationship between tract size and operative time. In our opinion, there also exists an inverse relationship between tract size bleeding and intraoperative visibility during miniaturized PCNL. Interestingly, this systematic review shows that miniaturized PCNL has a significantly longer operating time [2]. It needs to be emphasized that the smaller the tracts we utilize, the better should be the optics and devices to break and retrieve the fragments. Limitations in stone fragmentation and retrieval are important factors that contribute to longer operating times in miniaturized PCNL. The longer operating time in miniaturized PCNL could be offset by the use of a suction device compatible with small-diameter energy sources.

It needs to be emphasized that regardless of how small the tract size, the key to a successful procedure remains perfect percutaneous renal access. The ideal percutaneous tract should be a short, straight tract traversing the subcutaneous tissue and entering the calyx through the cup [3]. This principle is of utmost importance in miniaturized PCNL with smaller tracts, as an improper access tract invariably leads to troublesome ooze, which in turn obscures vision and can adversely affect the outcome.

As noted in the review, there have been anecdotal studies that address concerns regarding increased intrarenal pressure during miniaturized PCNL. It is worth remembering that although higher intrapelvic pressures were observed, these did not alter the outcome in terms of stone clearance and complications. Further randomized multicenter studies in the future would definitely address this issue.

The limitations of this review, as admitted by the authors, are the poor quality of the evidence drawn from small single-arm studies; notably, only two randomized control studies could be analyzed. In addition, we feel that there is a possibility that the data analysis might be skewed because of a lack of uniform terminology in articles describing new miniPCNL, ultraminiPCNL, and microperc techniques. For assessment of stone-free rates and immediate stone-free rates described in various studies in the review, either plain X-ray and/or ultrasound or computed tomography imaging was used. The lack of uniformity in various studies in both these regards hinders proper

DOI of original article: http://dx.doi.org/10.1016/j.eururo.2017.01.046.
* Corresponding author. Department of Urology, Muljibhai Patel Urological Hospital, Nadiad 387001, India. Tel. +91 98 24188685.
E-mail address: doctorarvind1@gmail.com (A.P. Ganpule).

http://dx.doi.org/10.1016/j.eururo.2017.02.028

Please cite this article in press as: Desai MDTDDIFFDR, Ganpule AP. Miniaturized Percutaneous Nephrolithotomy: A Decade of Paradigm Shift in Percutaneous Renal Access. Eur Urol (2017), http://dx.doi.org/10.1016/j.eururo.2017.02.028

comparison among the various miniaturized PCNL types. We need to standardize the terminology and methodology used to assess stone-free rates to avoid confusion in the contemporary literature. This in turn would facilitate acquisition of robust data for the future.

Radiation is a concern for the majority of endourologic procedures. In a study recently conducted at our center, we found an inverse relation between radiation exposure and the sheath size used. The mean radiation exposure to the surgeon was 0.29 ± 0.12 mSv, 0.18 ± 0.1 mSv, 0.16 ± 0.08 mSv, and 0.11 ± 0.04 mSv for an average sheath size of 26.5 ± 1.6 Fr (standard PCNL), 21.2 ± 1.7 Fr (miniperc), 10.7 ± 0.6 Fr (MIP Xs, Karl Storz GmBH), and 4.5 Fr (microperc; Polydiagnost GmBH), respectively. This suggests that smaller tract sizes have a potential to reduce radiation exposure to the surgeon, which of course needs to be validated in further studies.

Innovative ideas, techniques, and technology will continue to evolve further in the future. The benchmark for assessing the efficacy of any endourologic procedure is to ascertain the complication rates, stone clearance rates, and the need for ancillary procedures [4]. In this regard, the three "new kids on the block" namely miniperc, ultra-miniperc, and microperc, need to undergo the rigors of prospective randomized comparative studies to prove their worth.

Conflicts of interest: The authors have nothing to disclose.

References

[1] Clayman RV. Knife to needle to nothing: the waning of the wound. Braz J Urol 2001;27:209–14.
[2] Ruhayel Y, Tepeler A, Dabestani S, et al. Tract sizes in miniaturised percutaneous nephrolithotomy: a systematic review from the European Association of Urology Urolithiasis Guidelines Panel. Eur Urol. In press.
[3] Desai M. Ultrasonography-guided punctures—with and without puncture guide. J Endourol 2009;23:1641–3.
[4] Desai J, Solanki R. Ultra-mini percutaneous nephrolithotomy (UMP): one more armamentarium. BJU Int 2013;112:1046–9.

Please cite this article in press as: Desai MDTDDIFFDR, Ganpule AP. Miniaturized Percutaneous Nephrolithotomy: A Decade of Paradigm Shift in Percutaneous Renal Access. Eur Urol (2017), http://dx.doi.org/10.1016/j.eururo.2017.02.028