



European Association of Urology

## Open to Debate – Referee

# Percutaneous Nephrolithotomy: Which Position? The Referee's Verdict

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### Article info

#### Article history

Accepted October 8, 2021

#### Associate Editor:

Silvia Proietti

Percutaneous nephrolithotomy (PCNL) was established by pioneers including Peter Alken and Arthur Smith more than 40 yr ago [1,2]. The role of PCNL has been asserted over ureteroscopy (URS) and extracorporeal shockwave lithotripsy (ESWL) and this technique is recommended by all international guidelines as the standard of care for large renal calculi [3]. Several developments in the past 40 yr, such as miniaturization and the use of flexible endoscopes or laser lithotripsy, have improved stone-free rates and contributed to lower morbidity [4]. However, severe complications can occur, which limits the widespread use of this highly effective therapeutic approach [5]. While the frequency of PCNL is slightly increasing in Germany, it is less commonly performed in other countries such as the USA, where, in parallel, the probability of complications has been increasing [6]. This observation underlines the most critical factor for good surgical results: a trained and skilled urologist.

It is worth reflecting on the most important factors for optimal outcomes from PCNL. It all starts with a good puncture and establishing a percutaneous tract that provides ideal access to the stone. However, before puncture, the patient has to be positioned on the operating room (OR)

table. For decades, PCNL was performed in the prone position without questioning this approach, until urologists first described a supine procedure that was later developed to a modified lithotomy position to facilitate combined endoscopic intrarenal surgery (ECIRS) [7,8]. In this debate, Evangelos Liatsikos and Guido Giusti, both highly recognized experts in the field, share their convictions regarding the prone and supine positions.

The prone position is currently chosen by almost 80% of urologists worldwide [9]. Several systematic reviews have analyzed outcomes for prone versus supine procedures, and most could not detect significant differences between the positions in standard cases, with one exception: the overall operative time is in favor of a supine procedure, since the patient no longer has to be turned from the lithotripsy position after placement of a ureteral catheter [10]. Nevertheless, the prone position seems to offer more options for renal access for complex stone situations such as staghorn stones and horseshoe kidneys, although there is some controversy among experts [11].

So, what are the potential limitations of a prone procedure beyond OR time? Giusti lists several aspects: (1) convenience for the OR staff, with no flipping of (obese) patients; (2) convenience for the surgeon because of better ergonomics, with surgery in a sitting position; (3) convenience for the anesthetist and safety for the patient in terms of anesthetic risk and better airway control; (4) fewer complications, with a lower risk of colonic injury; and (5) better drainage of the collecting system, with easier evacuation of fragments and lower intrarenal pressure. I can agree only with the first. Turning an obese or very obese patient can be extremely difficult. The other statements are debatable. Good evidence shows that sitting is suboptimal for the human spine and should be limited during the day; it is

DOI of original articles: <https://doi.org/10.1016/j.euros.2021.10.005>; <https://doi.org/10.1016/j.euros.2021.07.009>.

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<https://doi.org/10.1016/j.euros.2021.10.006>

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with good reason that office workers invest in standing desks [12]. Regarding convenience for the anesthetist, that is usually not my primary concern. Is placing the patient in the prone position dangerous for the patient? There is no evidence that prone positioning of the patient has led to complications during PCNL, matching well with my own experience. Moreover, we know that critically ill patients (and this was highlighted again during the COVID-19 pandemic) are placed in the prone position for better pulmonary ventilation [13]. The risk of colonic injury is not a consequence of positioning but of the imaging modality used for identification of the puncture site. Such complications are extremely rare when using ultrasound for renal access, a modality that is easy to use and widely applicable in any position [14]. Intrarenal pressure depends on the endoscopic system used. A standard Amplatz sheath with a diameter of  $\geq 18$  Fr maintains sufficient outflow and consequently low intrarenal pressure [15]. In my own experience, the orientation of the sheath does not differ much between the prone and supine positions when choosing the access site under ultrasound guidance. But what about ECIRS? My personal view is that the additional benefit of a combined approach is minimal in most clinical scenarios and does not outweigh the significant additional efforts.

It should be kept in mind that even for experienced surgeons it is not that easy to change to using the supine position. The angle of puncture changes, the kidney is often hypermobile, and the tract length is generally greater. Urologists should be aware of having to manage, yet again, a learning curve.

I remember well a debate at an annual meeting of the European Association of Urology many years ago. Guido Giusti expressed his disappointment in me as a—back then—young urologist who still sticks with the prone position. He has not changed his mind. I must admit, I really like people being confident in doing the right thing. There is no doubt that the supine position is here to stay, and it seems to be equivalent to the prone approach. But are 80% of urologists blind die-hards? Probably not. There is certainly more than one way to skin a cat. It is the surgeon, not the position, that is important. Picking up my initial statement again, personal expertise and preference are the main factors for the best surgical outcomes.

The verdict of the referee is that the match ended in a draw.

**Conflicts of interest:** The author has nothing to disclose.

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