

Editorial referring to the paper published in this issue on pp. 191–192

UROLITHIASIS

## Getting access in PNL – eyes wide shut

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Perforation of the gallbladder during percutaneous nephrolithotomy (PNL) has been described only a few times. Even if underreported, it belongs to the group of complications that happen to urologists once in their life or never, and usually at the beginning of their career. Lacerations of the liver, spleen, renal vein, inferior vena cava, and more frequent perforations of the intestines are among them as well.

Despite decades of experience it seems that we still have not learned how to prevent these events. Morbidity rates are similar in large case series from the 1990s [1] and in contemporary studies [2]. The type of guidance used for a puncture does not make a difference. Although under fluoroscopy it is difficult to assess depth and localization of adjacent organs, ultrasound does not give us much advantage. For beginners, it is also easy to get lost while handling a needle and an ultrasound probe at the same time [3]. Evaluation of risk factors proved that in order to prevent adverse events we should address two areas: create centers of excellence (stone centers) and improve teaching techniques.

High volume centers provide faster, more efficient, and safer surgery [2]. This is common truth. However, decision-makers in countries such as Poland apparently are not aware of this. Here, a single national health insurance provider not only allows but requires that everyone do everything.

In such a reality, the role of training becomes of utmost importance. Residents usually make their first steps in endourology by placing nephrostomy tubes.

Then they start their experience with PNL. All of this is done under supervision, but is that enough? Their lack of expertise increases complication rates of departments and exposes patients to hazard. There are no formalized, validated methods of training in endourology. Simulators available on the market have limited number of training configurations and their role in preventing complications has not been proven so far.

Emerging technologies of virtual reality give us a chance for a step forward. I can find at least two applications developed for decreasing complication rates related to accessing the kidney.

Rassweiler et al. advocate the use of the iPad for visualization of the pelvicalyceal system, adjacent organs, and their interaction with a needle [4]. This is still a beta version but more teams are working on similar solutions [5]. The same technology could be used in future generations of simulators. Based on GPS technology, they should be able to create any kind of virtual renal unit seen on a monitor imitating real time fluoroscopy and combining the virtual organ with real instruments.

The case presented in the current issue of Central European Journal of Urology is an invitation for the discussion about these issues [6]. It also demonstrates that bile in the needle does not necessarily mean that laparotomy has to be performed right away. A conservative approach is a valid option although an operating theatre has to be available at all times.

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