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Urolithiasis
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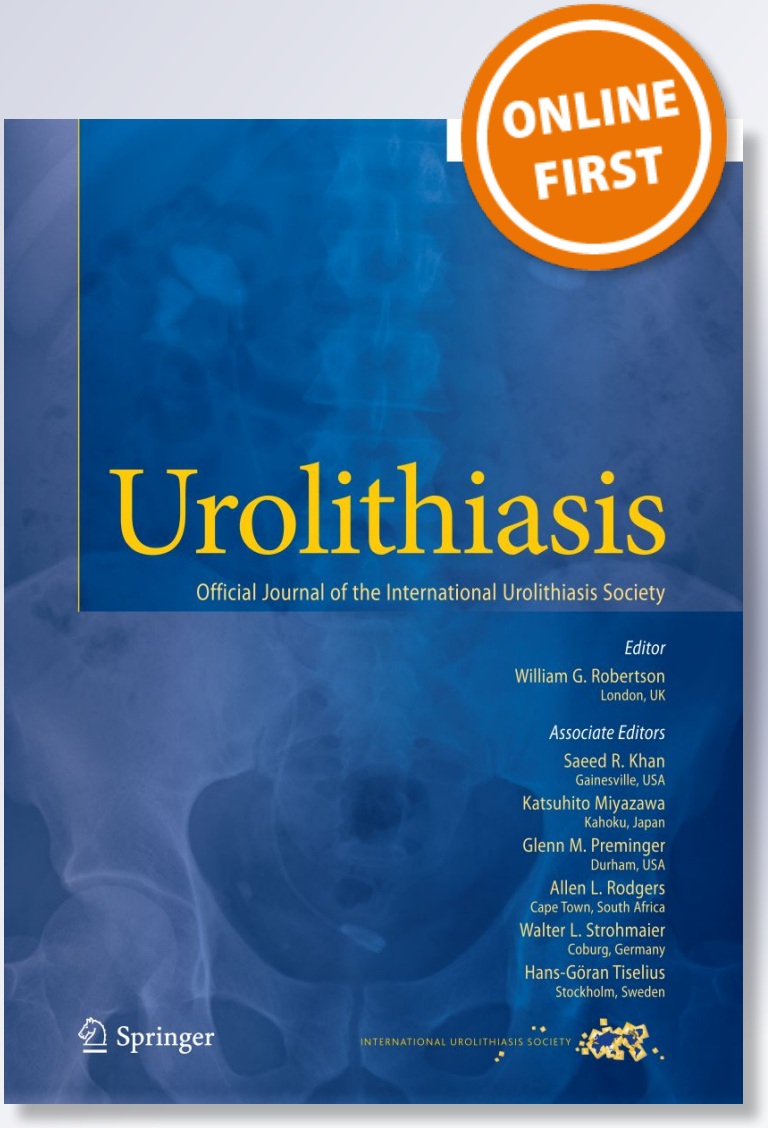
ISSN 2194-7228

Urolithiasis
DOI 10.1007/s00240-017-1028-4



Springer

Urolithiasis
https://doi.org/10.1007/s00240-017-1028-4

INVITED REVIEW

Preface: Breaking the stone

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Received: 14 November 2017 / Accepted: 15 November 2017

Over the last 50 years, the surgical treatment of urinary stones has changed tremendously. Whereas up to the 1970s, open surgery was the treatment of choice; various technologies have since been developed that have made stone treatment highly efficacious and much more minimally invasive for the patient.

This special issue aims at providing an up-to-date overview of available stone treatment options. It also discusses and presents not only the latest technological developments but also shares the vast experience of some of the leading experts in the field.

Modern surgical stone treatment is based on three basic technologies: extracorporeal shock wave lithotripsy (SWL), ureterorenoscopy (URS), and percutaneous nephrolithotomy (PCNL). The reader will immediately notice that there is no mention of open stone surgery. That does not mean that open stone surgery is completely obsolete. In certain cases, in experienced hands, and when other technologies or expertise in those technologies is not available, open stone surgery still deserves its place amongst the treatment options. In fact, open stone surgery is time-tested and still widely and successfully performed in many developing countries. But, in this technologically oriented Special Issue, we have chosen not to include it.

In a constantly changing world with constantly changing markets, traditional market-leading countries are turning inwards and losing their influence while others are developing rapidly—especially in the East—bringing qualitatively improved and affordable technological devices on to the market. That leads to these newest technologies being more and more adopted even in the developed world.

The first of these technologies, SWL, has been for many years the work-horse in many Stone Units. Unfortunately, SWL has fallen out of favour with many urologists. The reasons for this are manifold: SWL is a boring form of treatment for the surgeon and is often left to the most junior resident to operate; SWL is less attractive to perform than URS and laser fragmentation; SWL is not favoured by the reimbursement system in many countries; and SWL requires capital investment and a separate room. Consequently, in some countries the number of SWL machines has rapidly decreased. In others, it is still running as a work-horse procedure. As with so many technologies, the machine is only as good as the people who operate it. We learn in this issue from two grandmasters of SWL that and how we can improve this form of treatment. Do not forget that all these new technologies are minimally invasive, but SWL is the only "non-touch" technology.

Indispensable for all the endoscopic options is an effective intracorporeal stone fragmentation device. There are many devices on offer, with and without reliance on lasers. We have dedicated an article to provide an overview of the available systems and to highlight the pros and cons of each of these lithotripters.

URS can be performed as semi-rigid URS—mainly in the ureter—and as flexible URS—mainly in the kidney—also called retrograde intrarenal surgery (RIRS). Renowned experts share their indications, tips and tricks with the reader on both technologies, and in a further article the pathophysiological aspects and risks of URS are elucidated and prevention strategies highlighted.

Finally, the newest kid-on-the-block, robotic URS, has its own article. Gadget or necessity? Time will tell. The fact is that those who are lucky enough to have it would not want to be without it any more.

PCNL is well established around the globe for the treatment of larger stones. Discussions in the last decade have focused mainly on positions and miniaturization. Whereas most urologists know that there are basically two PCNL approaches, namely prone and supine, our article shows that there is actually a whole "Kamasutra" of positions available. Each has its own advantages and disadvantages, and the proficient stone surgeon should be able to use more than

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Published online: 21 November 2017

one to optimize and tailor the treatment to suit the individual patient.

In an attempt to minimize renal damage, complications and pain caused by the percutaneous approach, many recent efforts have been put into the miniaturization of the nephroscopes involved. This trend started with the mini-PCNL, and has now been continued with ultra-mini-PCNL and the micro-PCNL, together with some local variants. Two articles have been dedicated to mini-PCNL and micro-PCNL, also called the "all-seeing needle".

Combining the best of both worlds, endoscopic combined intrarenal surgery (ECIRS) combines URS and PCNL for the treatment of complex stone burdens. This is a relatively new but highly efficient approach and deserves its own article.

Finally, everybody talks of laparoscopy and, lately, robotic surgery in urology. But is there a role for it in stone surgery? Our last article tries to give an answer to this widely discussed but as yet unanswered question.

Technology is rapidly evolving, and I am aware that what is written here may no longer be true in 10, or even in 5 years. That makes it particularly important to have an up-to-date summary from time to time which provides a comprehensive overview and refresher. I am sure the reader will enjoy this encounter with the leading experts in stone treatment.

Compliance with ethical standards

Conflict of interest There are no conflicts of interest concerning the publication of this article.

Research involving human participants/animals There is no research involving humans or animals included in the article.

Informed consent Informed consent from patients was not required for the writing of this article.