

Taboo Topics Below the Belt

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Today's modern lifestyles have resulted in increasing numbers of urinary stones. Longer life expectancy brings more cases of incontinence and enlargements of the prostate gland with it. The growing number of sick people requires care that is efficient and close to home. We spoke to chief physicians at a city hospital and a university hospital regarding current advances.

By Hildegard Kaulen , PhD

Heilbronn: The Klinik am Gesundbrunnen is one of four acute-care hospitals in the hospital association of the city and county of Heilbronn, located in Germany's economically strong southern region. The facility is a maximum-care hospital with 850 beds. The hospital treats 33,000 patients annually on an inpatient basis, and 2.5 times as many on an outpatient basis. It aims to offer high-quality medicine using the best technical equipment. This mission completely applies to the Department of Urology. Its director is Professor Jens Rassweiler, MD. The spry urologist, who is also an Associate Professor at the Faculty of Medicine Mannheim, has headed the department for 13 years. He is a worldwide leader in minimal invasive surgery and was the first in Germany to remove a kidney laparoscopically. He has been working exclusively with this procedure since 1999, removing tumors on the prostate, kidney, bladder, and testicles through narrow openings in around 500 procedures per year. According to Rassweiler, he consistently applies the principles of open surgery to laparoscopy, and has obtained very good results in terms of tumor-free status, bladder function, and erectile function. Because of this minimally invasive approach, he has attracted considerable attention throughout Germany.

LITHOSKOP: Efficiency Redefined

Rassweiler appreciates the variety of tasks and methods in urology. He treats five different types of carcinoma, benign enlargement of the prostate, obstructions of the ureter, stone diseases, erectile dysfunction, and incontinence. He works with the holmium laser and with mono- and bipolar electrosurgery, as well as with shockwaves. The list of endourological and percutaneous procedures includes more than a dozen acronyms, from URS, PCNL, TUR-P, TUR-B, and TULIP, to TULVP. Most begin with the letter T, which stands for transurethral – through the urethra. For most urological and some orthopedic applications*, Rassweiler uses LITHOSKOP from

Siemens. He was also involved in the product development. This system is a multifunctional workstation; the X-ray source and therapy head freely move around the patient. The best feature, according to Rassweiler, is that the patient no longer has to be repositioned during the intervention. Nearly all treatments can be done in the supine or prone position, which are comfortable for the patient. Also, the anesthesiologist never has to change his/her position.

These factors ensure a smooth workflow, which is growing in importance due to the ever increasing restrictions on cost reimbursements. Additionally, data are stored digitally.

Rassweiler, who cares for dozens of patients each day, especially appreciates the multifunctionality of LITHOSKOP. He says it provides him with many options. What this means can best be explained using the example of lithotripsy. Shock-wave therapy is only one method for removing stones. They can also be broken down with a holmium laser and recovered via a small tube or removed by a small incision on the patient's back through which a tube and telescope instruments are placed into the kidney. All of these procedures are possible at LITHOSKOP. As a result, the decision for or against a procedure no longer needs to be made based on available equipment, but rather based solely on medical necessity.

Rassweiler, who has five times as many male patients as female patients, also uses LITHOSKOP to treat benign enlarged prostates. Because the disease typically affects older men, and their numbers continue to increase, the treatment of benign prostatic hyperplasia is taking an ever increasing share of Rassweiler's working day. With LITHOSKOP, he has various options at his disposal. He excises small volumes using electrosurgery and removes them via the urethra; for larger volumes he uses the holmium laser. Since all endoscopic sequences are presented live, the urologist always has clear visual monitoring. This enables him to better protect the nerve and vascular plexus responsible for erectile

“The complication rate with the LITHOSKOP is low.”

Professor Joachim W. Thüroff, MD,
Director, Department of Urology,
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function and bladder control. Because many men apparently have considerable inhibitions when it comes to typical male diseases, better education is required. Rassweiler explains, “Many repress or trivialize problems which are evident when urinating. We recently treated a 50-year-old, who had ignored his discomfort caused by prostatic hyperplasia for so long that the constant urinary obstruction caused renal failure. While this is an extreme example, it underscores the scope of the lack of knowledge we often have to deal with.”

‘Trust me – I’m a Doctor’

For this reason, Rassweiler does not shy away from employing unusual methods and using his other talents, such as his music skills, to provide education. He plays harp and guitar. In the 1990s, he founded the Mannheim ‘Uroband’ together with four colleagues at Mannheim University Hospital – three of whom are chief physicians at other German hospitals today. The group has recorded and produced six CDs and had many live appearances, including some on German television. The five do not mince matters in their lyrics, and

* Caution: LITHOSKOP is indicated in the U.S. as a urologic procedures system primarily designed for the fragmentation of urinary tract stones, such as renal calyx stones and renal pelvis stones and for upper, middle and lower ureteral stones by extracorporeal shock wave lithotripsy (ESWL).

In addition to ESWL use, the unit is designed for patient placement in positions which facilitate urological and diagnostic procedures.

Any procedures beyond these cleared indications, including, but not limited to, orthopedic and Peyronie's disease treatments, are not approved indications in the U.S.



With LITHOSKOP, nearly all treatments can be performed more comfortably with the patient in the supine position.

sing about kidney stones, testicular bruising, and the miraculous blue pill Viagra®. 'Trust me – I'm a Doctor' is the title of one of their songs. Rarely has education been so humorous and entertaining.

Scene Change: University Hospital

Mainz: An acute-care hospital, the Johannes-Gutenberg University Hospital in Mainz is also one of 34 Germany university hospitals and the only one in the state of Rhineland-Palatinate. In addition to providing medical care, the tasks of a university hospital include educating medical students and performing medical research. In the 1,500-bed hospital, 55,000 people are treated annually on an inpatient basis and

120,000 on an outpatient basis. Given the facility's mission, patients should be treated using the most modern procedures based on the results of the latest research. At the Department of Urology, which is directed by Professor Joachim W. Thüroff, MD, and enjoys an excellent reputation both domestically and abroad, one of the first LITHOSKOP systems was installed two years ago. Since then, the clinic has become an important reference center in area of stone treatment. Andreas Neisius, MD, who came to Mainz three years ago, helped develop numerous treatment protocols with Siemens, which many customers worldwide use for guidance. Although LITHOSKOP is a multifunctional workstation, it is used exclusively for shockwave therapy in Thüroff's department. There are two

reasons for this: There is no urology clinic with this offering in Rhineland Palatinate within a 100 kilometer radius. Thus, demand is high and LITHOSKOP operates the entire day at full capacity. The urology department in Mainz also has three other workstations equipped with UROSKOP systems. There, all other treatments are performed, ensuring an efficient workflow.

Immediately after LITHOSKOP was installed, Neisius and Thüroff investigated the effectiveness and safety of extracorporeal shockwave lithotripsy in a clinical study. Of the participants in the study, 82 suffered from kidney stones and 100 from ureteral calculi. The size of the kidney stones ranged from four to 25 millimeters, the ureteral calculi from three to 28 millimeters. With respect to the kidney stones, one in four patients had to be treated with shockwave therapy more than once, according to Neisius. For three-quarters of the patients, one application was sufficient. In the case of ureteral calculi, the success rate was even better. Here, only one in five patients had to undergo a second shockwave treatment. This meant that LITHOSKOP's efficiency was 1.3 treatments per patient and the repeat treatment rate only 21 percent. After three months, 73 percent of the patients were stone free.

Given the cost reimbursement system common in Germany, Thüroff explains the importance of a low repeat treatment rate through a simple correlation. "According to current [German] regulations, only one shockwave treatment per patient is paid. Repeat treatments are at the hospital's expense. For this reason there is a big difference if the value is 20 or 30 percent. Every percentage point means significant costs for us. In addition, the complication rate with the LITHOSKOP is low, which is another benefit. Only one patient developed a hematoma on the kidney."

State-of-the-art Technology

In shockwave therapy, neither the pressure nor the energy flux density determines the fragmentation of the stones concretely, but rather the total energy applied. It is the most important shockwave

parameter. The higher the total applied energy, the more likely the stone will break. Higher energy density only leads to greater trauma. It is responsible for producing hematomas and other complications. The best way to apply high shockwave energy at a low energy density is by enlarging the therapy focus. This is the method Siemens chose with LITHOSKOP. The system also has a high penetration depth – a benefit when treating obese patients.

The amount of energy to be applied during a shockwave therapy session depends on the location of the stone and its composition. Because of its many vessels and tissue rich in water, the kidney is more sensitive than the ureter. This organ is therefore more likely to be traumatized and has to be treated using lower energy compared to the ureter. Neisius explains, “In our study, kidney stones were shot with about 3,200 shockwaves with a total energy of 50 joules; ureteral calculi with 3,650 shockwaves

and 85 joules. Our protocols provide an upper limit of 60 joules for the kidney. For the ureter, the upper limit is 140 joules.” Whether the stones are broken down with shockwaves, or removed with an endoscope or via nephroscopy depends on the position and size of the stone. For kidney stones, according to Thüroff, shockwaves are the method of choice; as well for ureteral stones that are located in the upper and lower thirds. In contrast, stones that are larger and positioned in the middle third are more commonly removed with the endoscope. Stones that are smaller than three millimeters are generally passed on their own. Very large stones, according to Thüroff, occur very rarely due to improved medical care.

Hildegard Kaulen, PhD, is a molecular biologist. After positions at Rockefeller University in New York and the Harvard Medical School in Boston, MA, USA, she has worked since the mid 1990s as a freelance science journalist for leading newspapers and scientific journals.



Professor Jens Rassweiler, MD

Urologist, studied medicine at the University of Freiburg, Germany, and has worked in Stuttgart, Tübingen, and Mannheim, 1991 habilitation, Associate Professor at Mannheim University Hospital. Since 1994, Director of the Department of Urology at SLK Kliniken Heilbronn GmbH. He is a Board Member of the European School of Urology, former President of the European Intra-Renal Surgery Society, and was President of the Südwestdeutsche Gesellschaft für Urologie (South-West German Society for Urology) and the World Congress of Endourology in 2008.



Professor Joachim W. Thüroff, MD

Urologist, studied medicine in Marburg, Germany, 1982 habilitation, after working in Marburg, Würzburg, Mainz, and San Francisco, CA, USA, and was Director of the Urology Department at Wuppertal Hospital and Professor of Urology in Witten/Herdecke from 1987 to 1997. Since 1997, Director of the Urology Clinic and Polyclinic for Urology and Professor of Urology in Mainz. Professor Thüroff is a member of 18 national and international professional societies, was President of the Deutsche Gesellschaft für Urologie (German Society for Urology), and has received numerous awards.

Summary

Challenge

- The growing number of stone diseases, urinary incontinence, cancer in the kidneys, bladder, and prostate, as well as benign prostatic hyperplasia, require flexible and efficient care concepts
- The demands regarding results and safety of a treatment continue to increase
- Cost reimbursements are becoming much more restrictive
- In Germany, repetitive treatments using shockwave therapy are at the hospital's expense

Solution

- Because LITHOSKOP is equally suited for urodiagnostics, endourology, lithotripsy, and percutaneous interventions, the choice of procedure depends on the medical necessity, not the hospital's equipment
- Nearly all treatments can be performed in the supine position
- Thanks to its multifunctionality, a smooth and speedy workflow is possible

Result

- With LITHOSKOP, the repeat treatment rate for shockwave therapy is 21 percent, and efficiency is 1.3 treatments per patient
- After three months, 73 percent of patients remained stone free

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