Swiss Lithoclast® Trilogy's Role in the Treatment of Lithiasis



Interview with Professor Romain Boissier on March 19, 2024.
La Conception University Hospital, Marseille.



What is the incidence of lithiasis in France?

Many of the urological surgeries performed in France are for lithiasis: between 10% and 12% of the French population will have an episode of renal colic in their lifetime, and 50% of these will experience recurrences. Diet plays an essential role in the onset of lithiasis and reducing salt and calcium intake is key in preventing recurrences.

Renal colic episodes are the most common urological emergency and among the top 10 causes of emergency department visits (the French SurSaUD® network recorded 172,125 visits for a primary diagnosis of renal colic in 2019, figures from Santé Publique France). Only 23% of patients are hospitalized and the remaining 77% receive outpatient treatment.

What is the breakdown of the different types of lithiasis procedures performed at the La Conception University Hospital?

We perform over 350 to 400 ureteroscopies/renoscopies per year. Over 80% are performed with single-use flexible endoscopes and less than 20% with rigid endoscopes. We do about 30 percutaneous nephrolithotomies (PCNL) - half are standard PCNL and the other half are micro PCNL. Lastly, we perform about 20 operations for bladder stones.

Our neurourology department sees a lot of bladder stones caused by urinary retention, as well as stones related to benign prostatic hypertrophy (BPH) and calcifications of the proximal loop of the double J.

We are also reinitiating indications for extracorporeal shock wave lithotripsy (ESWL) thanks to a new piece of equipment we acquired very recently that comprises an X-ray machine and ESWL.

What role does lithiasis surgery play in your own work?

Lithiasis surgery accounts for a third of my work (mainly complex lithiasis treated percutaneously). The rest is split between kidney surgery (enlarged nephrectomy, laparoscopic or robotic partial nephrectomy, and nephrectomy for locally advanced tumors/thrombi) and kidney transplantation (living donor, graft, and autotransplant).

Do you perform mini PCNL (from 12 Fr)?

We have chosen not to use this technique and instead develop micro PCNL (4.85 Fr to 8 Fr). Our experience with the dual approach (percutaneous access and retrograde approach) over the past year has been very encouraging. It eliminates any enstonement of the urinary tract and overpressure (no Amplatz sheath) by placing an access sheath in the ureter, as demonstrated by Janak Desai, the first to use this technique and publish about it.

The dual approach means that the stone can be treated with micro-percutaneous surgery and the uretero-renoscope can be used to check for fragments in other calcific groups that are inaccessible via micro-percutaneous access. It can also be used to identify other lithiasis formations identified preoperatively and treat them with a laser introduced through the micro-percutaneous sheath.

The indications for mini- and micro-percutaneous procedures are virtually identical, and you can always switch to standard PCNL if the treatment time is too long.

I was able to treat a 35 mm stone in 1 hour and 15 minutes with a TFL Laser, faster than a Holmium:YAG Laser, and the patient was discharged on D+1. Performing a standard PCNL with Swiss Lithoclast® Trilogy would have been significantly faster, but the patient would have to be hospitalized for 1 or even 2 days more days.

When and why do you work with Swiss Lithoclast® Trilogy?

We use Swiss Lithoclast® Trilogy to treat staghorn or complex stones during standard PCNL and to break up bladder stones. It has even become the gold standard for removing ureteral calculi with a rigid ureteroscope. Laser is only used if Swiss Lithoclast® Trilogy is not available.

In the literature, laser treatment of ureteral stones is associated with a higher incidence of ureteral stenosis. Bearing in mind that the average reaction time of the human body is one second, if a frequency of 20 Hz is used in the ureter and you fire next to the stone, this will result in twenty or so blows to the ureteral wall. The laser can be used in the ureter, but this requires dedicated settings: low power to avoid local heating and low frequencies to prevent damage from direct blows to the ureteral wall. What's more, the laser can cut through the stone baskets that hold the stones in place for easier treatment. Using Swiss Lithoclast® Trilogy comes with none of these drawbacks and is just as effective. Even though retrograde endourological equipment has come a long way (flexible sensor URS, Holmium:YAG Laser, Thulium Fiber, Thulium:YAG), we are still waiting for the level of evidence required for the "perfect laser", with standard values that can break up a stone as quickly as possible and safely for all patients.

Science argues in favor of using percussive energy in the ureter. Using Swiss Lithoclast® Trilogy, in standard PCNL or for bladder stones, with larger-diameter probes, makes treatment times significantly faster and breaks stones down into microfragments and dust faster than laser, even when using large fibers or lasers that can provide high energy levels, high frequencies, and high power levels, like in the bladder.

Swiss Lithoclast® Trilogy's sensitive suction settings let you strike the right balance between irrigation and suction.

In your opinion, is the percutaneous approach losing its appeal in France for the treatment of lithiasis?

It may seem like it, but percutaneous surgery remains the gold standard treatment for staghorn and complex kidney stones. It's usually the best option for staghorn stones, complex stones that can be treated in one session instead of three or four.

Do you think more training can help popularize percutaneous surgery?

In France, the percutaneous approach is less widely used than the retrograde approach. The complications, learning curve, and the appropriate technical platform needed to manage complications, especially embolization, make implementing PCNL of any kind (micro, mini, or standard PCNL) more work than the retrograde approach, which can also be performed on an outpatient basis. Nevertheless, the percutaneous approach remains the reference technique for staghorn stones. It's a university hospital's job to offer this procedure and teach our young surgeons the technique and its peri-operative management during their training, whether or not they actually perform the procedure. ■

