

## Laser Lithotripsy for Treatment of Urethral and Bladder Uroliths

### Frequently Asked Questions for Veterinarians

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#### *What is Laser Lithotripsy?*

Laser lithotripsy has been in use since the 1980s to break up small uroliths in the urinary tract so that they may be easily passed. Laser Lithotripsy in dogs and cats has been performed for over 10 years. The procedure is performed under general anesthesia via cystoscopy. The patient is anesthetized and a cystoscope is passed through the urethra into the bladder, addressing urethral stones as they are encountered. A Holmium:YAG laser fiber is passed down the working channel of the scope and the laser is placed against the urolith and fired to break it up. Once the pieces of urolith are small enough to safely pass out of the bladder and through the urethra, a voiding urohydropulsion is performed to remove them. Uroliths in the urethra may also be removed after breaking up using a stone basket passed through the scope. Radiographs are performed after the removal of the uroliths to verify clearance. Urolith fragments are generally submitted to the University of Minnesota Urolith Center for analysis. Laser lithotripsy is used to break up uroliths in the urethra and bladder only, not the ureters or renal pelvis. The procedure removes existing uroliths, but does not in itself impact the risk of future urolith formation.

#### *What are potential risks/complications of Laser Lithotripsy?*

As with all anesthetic procedures, there is some risk associated which may depend on the overall health status of the patient. The procedure can be long in patients with many uroliths which must be broken up, and this should be weighed carefully in relation to the time and trauma of a cystotomy. Some uroliths may be embedded in the wall of the penile urethra in males, leading to a significant amount of bleeding after their removal. As with any cystoscopic procedure, there is a small risk of bladder or urethral trauma from either the laser, the scope, or the sharp edges of the uroliths themselves. These are rare complications which are usually managed with an overnight hospital stay and an indwelling urinary catheter. Rarely a complication may necessitate the removal of remaining uroliths via cystotomy.

#### *How do I know if my patient qualifies for the procedure?*

Patients must be large enough for the use of the available cystoscopes. An 8 Fr (or larger) urethral catheter must be able to be passed into a male dog's urethra in order to assure that the cystoscope will fit. Female dogs must be large enough that a 5.7 mm rigid cystoscope (~18 g catheter size) can safely be passed through the urethra. All male cats and most female cats will not be large enough to have the procedure performed. It is desirable to assess and treat the patient for urinary tract infection, or try a dissolution diet first if there are indicators that the uroliths are composed of struvite (urine pH > 8, infection with urease splitting bacteria). Because of the risk of ascending pyelonephritis, it is preferred that the patient have an inactive urine sediment or negative urine culture prior to the procedure, unless obstruction necessitates more urgent treatment. Patients with many large uroliths ("bag of rocks") often require long anesthetic times to break down the stones sufficiently to pass through the urethra and surgical removal may be preferred. Patients with many small uroliths and 1-3 larger ones are better candidates, as are patients with urethral uroliths, especially males since the uroliths may be difficult to flush back into the bladder during cystotomy. If you have any concerns as to whether your patient qualifies, Dr. Byron is happy to evaluate radiographs and discuss the case with you at no charge.

*How much does it cost?*

Laser lithotripsy estimates range from \$1800 - \$2500. The range is wide due to the variability in anesthetic time and difficulty in removing stones between patients. All patients undergoing anesthesia 5 years of age or older must have a CBC and Serum Chemistry performed within 30 days prior to the anesthetic procedure. While we try not to repeat any testing performed by a referring veterinarian, abnormalities in test results and changes in the patient's condition may necessitate it. Radiographs or other imaging are always performed the night before or morning of the lithotripsy procedure to determine the number of uroliths and their location within the bladder or urethra as this can change.

*What should my clients expect during their visit to OSU for their pet's Laser Lithotripsy?*

The client and their pet will have an appointment with the internal medicine service during normal appointment times, and the clinician will assess the animal to determine if it qualifies for the procedure. If the pet is a candidate, the lithotripsy and associated procedures (i.e. anesthesia) will be discussed with the owner and they will be given the option of leaving the pet overnight in the hospital or bringing it back in the morning before 7:30 AM for the procedure. In some cases, the owners may elect to have the procedure performed at a later date. Arrangements for this will be made on a case-by-case basis to best fit the client's needs. Laser Lithotripsy is generally not performed on the day of the first visit because of scheduling and time restrictions. Depending on the duration of the procedure and recovery from anesthesia of the patient, it may be possible for some animals to be released to their owners the evening of the procedure. If complications occur or the patient is not stable, the clinician may advise that the patient stay in the hospital the night of the procedure for monitoring and pain control. Patients may have a small amount of blood in their urine for 1-2 days after the procedure, and will be released on pain medication and short term prophylactic antibiotics.

*What should I expect when I refer clients for Laser Lithotripsy?*

If you refer a patient for laser lithotripsy, you will be contacted the day or evening of the initial visit. If the patient is determined not to be a candidate for lithotripsy and the owner is interested in a cystotomy, you will be contacted regarding your wish to have the patient return to your clinic for the procedure or pursue a soft tissue surgical consult at OSU-VMC. After the patient is discharged, you will receive a faxed referral letter with the details of the procedure. If uroliths were removed and submitted for analysis, the OSU clinician will contact you and the client with the results in about 3-4 weeks. The OSU clinician is also willing to make any recommendations for stone prevention and surveillance.

*Who do I contact if I have questions or need to arrange a referral?*

Dr. Julie Byron can be reached through the OSU VMC Veterinary Referral Line at 614-292-0950 for questions regarding the procedure. Clients may make appointments for their pet through the main appointment line, 614-292-3551.