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ESWL Lithotripsy



The lithotripter attempts to break up the stone by using an externally-applied, focused, high-intensity shock waves. The sedated or anesthetized patient lies down in the apparatus' bed, with the back supported by a water-filled balloon like device placed at the level of kidneys. X-ray imaging system or an ultrasound imaging system is used to locate the stone and aim the treatment. The shock wave pulse is generated at the machine and is delivered to the focussed stone. The treatment usually starts at the equipment's lowest power level, in order to accustom the patient to the sensation. The length of gap between pulses can be controlled to minimize tissue damage. The final power level usually depends on the patient's pain threshold and the observed success of stone breakage. If the stone is positioned near a bone (usually a rib in the case of kidney stones), this treatment may be more uncomfortable because the shock waves can cause a mild resonance in the bone which can be felt by the patient. Alternately the patient may be sedated during the procedure. This allows the power levels to be brought up more quickly and a much higher pulse frequency, often up to 120 shocks per minute.

The successive shock wave pressure pulses fragment the stones into smaller pieces that then can easily pass through the ureters. The process takes about an hour. A ureteral stent (a kind of expandable hollow tube) may be used at the discretion of the urologist. The stent allows for easier passage of the stone by relieving obstruction and through passive dilatation of the ureters.

This stent should be removed after 2-12 weeks, after the stone clearance. Failure to remove or forgetting the stent for long time can damage the kidneys as well as removal of the forgotten stent involves a lot of surgical risk and complications.

Extracorporeal lithotripsy works best with stones between 4 mm and 2 cm in diameter that are still located in the kidney. ESWL can be used to break up stones located in ureters as well, but with a lower rate of success. The success rate for renal stone is 62-91%.

ESWL is the least invasive of the commonplace modalities for definitive stone treatment, but provides a lower stone-free rate than other more invasive treatment methods, such as ureteroscopic manipulation with laser lithotripsy or percutaneous nephrolithotomy (PCNL). The passage of stone fragments may take a few days or a week and may cause mild pain. Patients may be instructed to drink as much water as practical during this time. Patients may void through a stone screen in order to capture stone fragments for analysis.

ESWL is not without risks. The shock waves themselves, can lead to capillary damage, renal parenchymal or subcapsular hemorrhage. It can cause haematuria-blood in the urine, pain due to passage of stone fragments or obstruction, steinstrasse and risk of incomplete fragmentation. Obstruction and infection may lead to urosepsis. Other common complication is skin bruising which is self healing by itself.

Patients may need additional or adjunctive therapies