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Procedure

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Treatment of urolithiasis using extracorporeal shock wave lithotripsy Saptarshi Pal^{1*} and Alexander Valerievich Subbotin²

Department of Hospital Surgery (Head-PhD., associate professor A.V. Kasatov), Russia

***Corresponding Author:** Saptarshi Pal, Department of Hospital Surgery (Head-PhD., associate professor A.V. Kasatov), Perm State Medical University named after academician E.A. Wagner, Perm, Russia, Email: bpalsas@gmail.com

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Abstract

Aim: For many years extracorporeal shock wave lithotripsy is known for the first line of treatment of urolithiasis in Perm Regional Clinical Hospital. All of the patients were treated with Dornier MedTech lithotripter. 329 patients were treated by extracorporeal shock wave lithotripsy. Complications were registered in 7 (2,1%) patients. The effectiveness contains 95,7%.

Purpose: The aim of this study was to analyze the effectiveness of using extracorporeal shock wave lithotripsy in treatment of urolithiasis.

Keywords: Kidney stones; Ureter stones; Extracorporeal shock wave lithotripsy

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Introduction

The introduction of extracorporeal shock wave lithotripsy (ESWL) in the early 1980s revolutionized the treatment of patients with kidney stone disease. Patients who once required major surgery to remove their stones could be treated with ESWL, and not even require an incision. It is a method of non-invasive treatment following the treatment of kidney stones and also an effective one. It turns out that we can identify some patients who will be unlikely to experience a successful outcome following ESWL, whereas we may predict that other patients will be more likely to clear their stones. Although many of these parameters are beyond anyone's control, such as the stone size and location in the kidney, there are other maneuvers that can be done during ESWL

treatment that may positively influence the outcome of the procedure.

Material and Methods

The study included 329 patients who were recruited and treated by extracorporeal shock wave lithotripsy in Perm Regional Clinical Hospital in 2018 year. Among them, 174 (53%) were women and 155 (47.11%) were men. The average age in female was 53,9 and in men - 50,6. There were 195 (59,3%) patients with the kidney stones and 134 (40,7%) stones were in the ureter. Stone location in the left urinary system were in 172 (52,3%), in the right -157 (47,7%) patients. In our own patients, we found that stone formers have lower kidney function (KF test) than normal people. The common idiopathic calcium stone formers are just slightly low. Likewise, for those with primary

hyperparathyroidism. But kidney function is reduced by about 30% in people who make stones because of bowel disease or diseases like renal tubular acidosis or cystinuria. All analysis and instrumental examinations were performed before hospitalization to the urology department.

	Men (155)	Women (174)
Average sex ratio	47.11%	53%
Average age	50.6	53.9
Location	172 (52.3%) Left	157 (47.7%) Right
Localization	195 (59.3%) kidney	134 (40.7%) ureter

During the treatment: Selected parameters

1. Power of shockwave - Level 3
2. The frequency of shockwave -3000 average
3. Average time of shockwave $\approx$ 1 hour
4. Manufacturer data- Dornier MedTech
5. Average sessions $\approx$ 2 times

High energy level + high frequency = shorter treatment time

Low energy level + low frequency =longer treatment time

- **Post Treatment:** Patient were administered with antibiotic therapy (Cifran 500 mg twice a day) but in some cases they weren't used.
- Remaining Stone => ESWL again

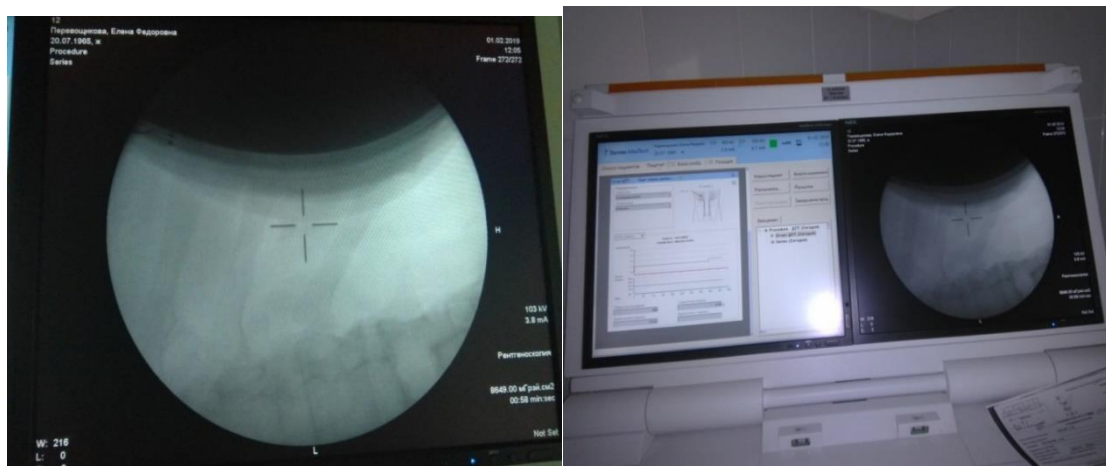
Protocol of diagnosis: The patients with heavy abdominal/flank/back pain were ruled out to Xray examination. The patients with renal calculi (>5mm) were again referred to urologic evaluation for creatinine, calcium and

uric acid culture. The patient was admitted to regional hospital Perm. If stone the stone doesn't passes within 2-4 weeks. the patients were treated under extra corporeal shockwave lithotripsy.

Indications: ESWL is preferred method for the treatment of urolithiasis. The procedure is safe and non-invasive. A very high level of care should be taken while performing ESWL as high level of shockwave can lead to hematoma.

Results

Antibiotic therapy (cifran 500 mg twice a day) was started in the day of extracorporeal shock wave lithotripsy. Half an hour before performing lithotripsy analgesics (promedol, relanium, ketoprofen) were administered to the patients for pain relief. The patients were observed under the X-ray where the stones were focused to be smashed down. Under the guidance of the urologist and Dornier MedTech lithotripter an average of 3000 shockwave were given with a maximum intensity of 3 level. Total procedure time was around 1 hour for each patient. 530 extracorporeal shock wave lithotripsies were done for 329 patients. In maximum of the patients the process was repeated 2 times because they remained unaffected. After extracorporeal shock wave lithotripsy localization of the stone was controlled by X-ray examination. Complications after extracorporeal shock wave lithotripsy were registered in 7 (2,1%) patients: 6 patients had acute pyelonephritis and one patient had subcapsular kidney hematoma. The average range of hospitalization patients with complications was 16 days. In 11 (3,3%) patients extracorporeal shock wave lithotripsy was supplemented by contact lithotripsy. The effectiveness of extracorporeal shock wave lithotripsy contains 95,7% [1,2].



Conclusion

From the above data we can conclude that extracorporeal shock wave lithotripsy is one of the preferable methods which helps effectively destroy existing stones in the kidney and ureter.

References

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