



Open Access

Complications Post Extracorporeal Shock Wave Lithotripsy: Literature Review Study

Hani Albadawe^{1*}

¹Johns Hopkins Aramco Healthcare, Saudi Arabia

*Corresponding Author: Hani Albadawe, Johns Hopkins Aramco Healthcare, Saudi Arabia;
Email: hani.albadawe@gmail.com

Received Date: 14-08-2022; Accepted Date: 30-08-2022; Published Date: 07-09-2022

Copyright© 2022 by Albadawe H. All rights reserved. This is an open access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution and reproduction in any medium, provided the original author and source are credited.

Abstract

Since its introduction in 1980, Extracorporeal Shock Wave Lithotripsy (ESWL) has completely changed how urolithiasis is treated. A recognised, secure, and efficient therapeutic alternative to surgical urolithiasis treatment is Extracorporeal Shock Wave Lithotripsy (ESWL). A small percentage of individuals do experience ESWL complications, and when they do, the kidney is frequently involved. The important literature on extracorporeal shock wave lithotripsy (SWL) treatment and complications was examined and reviewed in order to pinpoint potential issues following SWL. The development and transit of fragments, infections, effects on renal and non-renal tissues, and impacts on kidney function are the main causes of complications after SWL. Each of these risks can be avoided by taking the proper precautions, identifying and treating concurrent disorders or infections, and using the SWL in the safest and most effective manner possible while personalising the treatment for each patient. In conclusion, SWL is a successful and largely non-invasive method of treating kidney stones. There are various side effects and potential consequences, just like with any other sort of therapy, though. The danger of the emergence of others side effects might be significantly reduced by strict management to the first side effect that might arise; however, this must be completely understood in order to put every preventive step at our disposal into action. Different studies mentioning different cases and statistics related to the complications post ESWL were considered and reviewed for this document.

Albadawe H | Volume 3; Issue 3 (2022) | JSRP-3(3)-044 | Review Article

Citation: Albadawe H. Complications Post Extracorporeal Shock Wave Lithotripsy: Literature Review Study. J Surg Res Prac. 2022;3(3):1-5.

DOI: <https://doi.org/10.46889/JSRP.2022.3301>

Keywords

Computed Tomography; Fever; Extracorporeal Shock Wave Lithotripsy; Hypertension

Introduction

Kim, et al., described a case of a young female patient who underwent ESWL for a 9mm stone in the right kidney and afterwards developed a massive hepatic subcapsular hematoma and hypovolemic shock [1]. The hematoma was 13cm in diameter. Because there was no sign of active bleeding on the computed tomography, conservative treatment without surgical intervention was chosen. After receiving conservative treatment, the hematoma gradually disappeared and the patient was then let go. Pain, a little fever and syncope are common clinical symptoms of hematoma in patients. When pain doesn't go away after taking analgesics or when there are symptoms that point to hypovolemic shock, such syncope, orthostatic hypotension, or a low haemoglobin level, a hematoma should be suspected. When the mentioned patient complained of abdominal pain, the local clinic mistook it for colic pain brought on by passing a piece of stone. As a result, she was solely given painkillers; nonetheless, the analgesics had no effect on her agony. She was referred to our ER, where they found that she had a very low haemoglobin level and blood pressure, raising the possibility that she was suffering from hypovolemic shock. After ESWL, a CT scan, magnetic resonance imaging, angiography, or ultrasonography should be performed to identify bleeding problems. Recently, CT scanning has been advised for this. When chronic, idiopathic pain develops after ESWL, a CT scan of the abdomen should be performed to rule out bleeding. In the mentioned situation, the local clinic took a while to perform a radiologic examination, but after she was transferred to our hospital, we used a CT scan as a diagnostic tool and for the follow-up test. Hematoma following ESWL are best treated with supportive care. However, if hypovolemic shock symptoms are present or the haemoglobin level is significantly low, transfusion should be begun as away. For situations that do not respond to transfusion and supportive care, such as watchful waiting or percutaneous draining of the blood collection, embolization or surgical therapy should be taken into consideration.

Following an ESWL, complications can result from (D'Addessi, et al.,) [2]:

- Fragment development and passage
- Infections
- Effects on renal and nonrenal organs
- Impact on renal function
- Hypertension

Fuchs, et al., suggested that the initial stone mass directly influences the frequency of postprocedural problems during the elimination of gravel and the amount of time required for

elimination [3]. Approximately 10% of patients with stones smaller than 2.5 cm require invasive auxiliary procedures (percutaneous nephrostomy, ureteroscopy) after ESWL, but up to 60% of patients with bigger stones require auxiliary operations. The most frequent side effect of ESWL therapy is ureteral steinstrasse, which manifests as hydronephrosis and ureteral blockage brought on by passing debris. In about 60% of all stone patients, this condition can be found on ultrasound at some point during the follow-up. Smaller stones typically do not require treatment and the steinstrasse disappears within days with only occasional soreness as the only clinical sign. Percutaneous drainage is necessary in situations of protracted occlusion where obstructive pyelonephritis (5%) may develop. Additionally, a 2 percent long-standing obstruction without symptoms needs to be alleviated. Since gravel typically passes by itself through nephrostomy tube drainage, ureteroscopy is performed less frequently (3%) than it once was. The likelihood of problems such as discomfort, obstructive pyelonephritis and urosepsis often rises as stone size increases. Patients who still have stone material in them need to be monitored carefully until they are clear of it.

Although it is a minimally invasive procedure, ESWL has been linked to a wide range of kidney and other organ damage. It is clear that ESWL causes a number of acute clinical and subclinical consequences, some of which may have an impact on renal function and long-term blood pressure. Nasu, et al., based on their multiinstitutional analysis of 6852 cases treated at Okayama University Hospital and its affiliated facilities, as well as an extensive literature review, they examined the common and unusual problems connected to ESWL [4]. In their study, they examined the link between the type of shockwave generator utilised and the occurrence of acute symptomatic problems, such as post-ESWL fever, which is a common complication and renal subcapsular hematoma, which is a rare one. The overall incidence of subcapsular hematoma and post-ESWL fever was 0.6% and 4.2%, respectively. The incidence of these problems was higher with electrohydraulic lithotriptors than with electromagnetic and piezoelectric lithotriptors.

Wagenius et al., conducted a study to find out the level of complications for the patients having stones [5]. 1838 stones were treated in total, with 1185 (64.4%) localised in the renal pelvis and the remaining 415 (22.5%) and 205 (11.1%) located in the upper and lower thirds of the ureter, respectively. In all, 75 patients (4%) and 116 out of 1838 (6.4%) required hospitalisation within 14 days of the ESWL. 44 instances (2.4%) of infection were discovered, with 33 cases having positive urine cultures. In 41 cases (2.2%), invasive or surgical interventions were carried out. With ESWL, the risk of complications from distal stones was reduced. Significantly increasing the risk of complications were diabetes, larger stones and the requirement for antiemetics during treatment. Modern treatments for ESWL have few side effects. To lessen complications, a frequency of 1 Hz should be used. Complications are more likely if the patient has diabetes and larger stones. Further research and special consideration are needed for the use of antiemetics during ESWL. Distal stones appear to have a lower risk of complications.

Molina, et al., conducted a study on the subcapsular liver haematoma that is a very rare complication for ESWL [6]. Up to 7% of individuals undergoing ESWL will experience a moderate consequence, such as hematuria, flank pain, or a urinary tract infection; nevertheless, life-threatening complications might occasionally occur. Just as it did for our patient. Few occurrences of hepatic hematoma following ESWL have ever been documented. Obesity, diabetes, hypertension and clotting disorders have all been mentioned as important risk factors. The shock waves themselves or cavitation bubbles in the urine medium, which can cause capillary damage and ultimately renal or subcapsular bleeding, are frequently the cause of the hematomas. Fortunately, most of the time the blood clot's weight breaks a blood vessel between the liver parenchyma, which usually ends the bleeding.

Seker, et al., studied that Emphysematous UTI following ESWL is a very uncommon, potentially fatal disease [7]. There have only been a few cases documented in the literature. The first early period isolated EP after ESWL is presented in this case study. Similar to EPN, EP is primarily brought on by uncontrolled diabetes and blockages in the urinary system. The gas in EP is only present in the pelvicalyceal system and thus has a better prognosis. It frequently coexists with obstructive uropathy brought on by stones, stenosis and tumours. Patients who experience fever and flank pain following ESWL should have an NCCT scan done to check for the presence of gas; even though EP is extremely unlikely, it should be considered. In the emergency room, quick identification, evaluation and treatment of these individuals are crucial. Medical intervention and percutaneous nephrostomy catheters are effective ways to obtain positive outcomes.

Alzeerelhouseini, et al., documented only 11 cases of post ESWL acute pancreatitis [8]. Abdominal pain is almost always the first symptom to appear less than 24 hours after receiving ESWL treatment. Therefore, it should be considered while determining the cause of acute stomach pain following ESWL. Despite the fact that ESWL is widely regarded as a safe and effective treatment, severe problems have only been observed in less than 1% of patients. Pancreatitis and pancreatic pseudocyst formation are two extremely unusual consequences.

Conclusion

In the review of literature, it was found that ESWL is quite safe and the rate of complications after the procedure is very less. However, there are often cases where the complications after the procedure are missed or get confused with other symptoms and sometimes under reported. The ESWL complications need proper care, attention and patients after the surgery should be educated in case of any chances of post-surgery complications. As in very rare cases, the complications can be life-threatening.

Conflict of Interest

Author declares no conflicts of interest.

References

1. Kim TB, Park HK, Lee KY, Kim KH, Jung H, Yoon SJ. Life-threatening complication after extracorporeal shock wave lithotripsy for a renal stone: a hepatic subcapsular hematoma. *Korean J Urol.* 2010;51(3):212-5.
2. D'Addessi A, Vittori M, Racioppi M, Pinto F, Sacco E, Bassi PF. Complications of extracorporeal shock wave lithotripsy for urinary stones: To know and to manage them-A Review. *The Scientific World J.* 2012.
3. Fuchs GJ, Chaussy CG, Fuchs AM. Management of complications following extracorporeal shock wave lithotripsy: SpringerLink. 2022.
4. Nasu Y, Kurashige T, Kumon H. Common and uncommon complications related to ESWL. In *Treatment of Urolithiasis*. Springer, Tokyo. 2001;153-66.
5. Wagenius M, Jakobsson J, Stranne J, Linder A. Complications in extracorporeal shockwave lithotripsy: a cohort study. *Scandinavian J Urol.* 2017;51(5):407-13.
6. Molina GA, Moyon MA, Moyon FX, Tufiño JF, Guzmán LJ, Mecias RA, et al. Subcapsular liver hematoma after extracorporeal shock wave lithotripsy, a rare complication. *J Surgical Case Rep.* 2019;2019(4):rjz114.
7. Seker KG, Arikan Y, Seker YC, Ozlu DN, Evren I. An unexpected complication after extracorporeal shock wave lithotripsy: emphysematous pyelitis. *Cureus.* 2020;12(5).
8. Alzeerelhouseini HI, Abuzneid YS, Ashhab HA. Acute pancreatitis with giant pancreatic pseudocyst as a complication of extracorporeal shock wave lithotripsy: A case report and literature review. *Annals Medicine and Surg.* 2021;66:102442.