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CASE REPORT

Successful evacuation of large perirenal hematoma after extracorporeal shock wave lithotripsy (ESWL) – step 1 of the IDEAL recommendations of surgical innovation

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Key Clinical Message

Larger perirenal hematomas after extracorporeal shock wave lithotripsy (ESWL) are sometimes related to the loss of renal function due to compression of the normal renal tissue. After computed tomography-guided drainage and locally applied urokinase, the hematoma was fractionally evacuated. This procedure is a save and fast way to recover normal renal function.

Keywords

Complication, extracorporeal shock wave lithotripsy, lithotripsy, perirenal hematoma.

Introduction

Extracorporeal shock wave lithotripsy (ESWL) is still an important part of the urologic armamentarium for stone therapy [1, 2]. There are usually few and mild complications like steinstrasse, renal colic, residual stone growth, and bacteriuria [3–5]. Symptomatic perirenal hematoma is a more severe problem [6–8]. In particular, larger hematomas are able to lead to impaired renal function due to compression of the renal tissue. Waiting for spontaneous resolution is the most common strategy for small or medium hematomas [9]. Simple percutaneous drainage has also been reported [10].

Patient-tailored innovative surgical approaches are difficult to standardize, and respective recommendations cannot easily be generalized. A new approach, the IDEAL method, has been proposed in 2009 by McCulloch and colleagues [11]. The IDEAL procedure clearly provides stages of surgical innovations, which allow for the ability to assign a new method to its specific level of development and evidence. Following the IDEAL recommendations, we present this case report at the "Idea level."

Case Report

In September 2013, a 76-year-old Caucasian male patient (178 cm, 102 kg) was presented to our Department of Urology for ESWL of 8-mm stone in lower part of the right kidney. No history of anticoagulative therapy was reported. Laboratory studies revealed normal values for hemoglobin (8.9 mmol/L), white blood cells (8.4 Gpt/L), thrombocytes (158 Gpt/L) serum creatinine (71 μmol/L), and basic coagulation screen.

Extracorporeal shock wave lithotripsy was performed using a Wolff Piezolith 3000. A total of 4000 shock waves were applied for disintegration of the stone (frequency: 2 Hz, intensity: 13). About 12 h after the procedure, the patient reported only a light right flank pain, not colicky. Beside that the patient reported about hematuria, but in the normal range often reported after that treatment. Ultrasound examination revealed a hematoma. This was

verified with computed tomography (ct). The size of hematoma was approximately 10 × 7 × 6 cm (Fig. 1). The hemoglobin value declined to 6.4 mmol/L, and serum creatinine was elevated to 154 μmol/L. The patient was hemodynamically stable all the time.

A Tc-99 m-MAG3-Clearance 3 days later showed a reduced accumulation in the lower part of the right kidney with a partial obstruction (Fig. 2).

To be more secure not having a new bleeding, we waited more than 48 h before the puncture of the hematoma, just to be more sure that it is organized and not too liquid. We performed a CT-guided drainage of the hematoma 4 days after ESWL. A 12-French catheter was used. During the following days, urokinase was applied. The decision to choose urokinase was based on the good experience with that drug in other medical indications and the easy availability in our hospital. We used 50,000 IE Urokinase (Urokinase 50,000 HS medac) in a 20 mL 0.9% saline solution. This was applied through the drain. The drain was closed for 1 h and then opened again. The procedure was performed twice a day. Fourteen days after ESWL, the hematoma was nearly completely solved (Fig. 3). The drainage was removed subsequently.

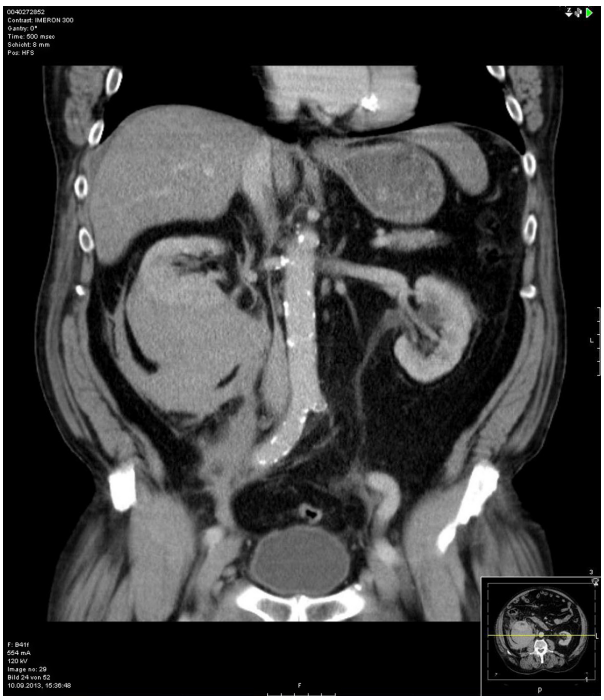

Figure 1. CT scan of large perirenal hematoma.

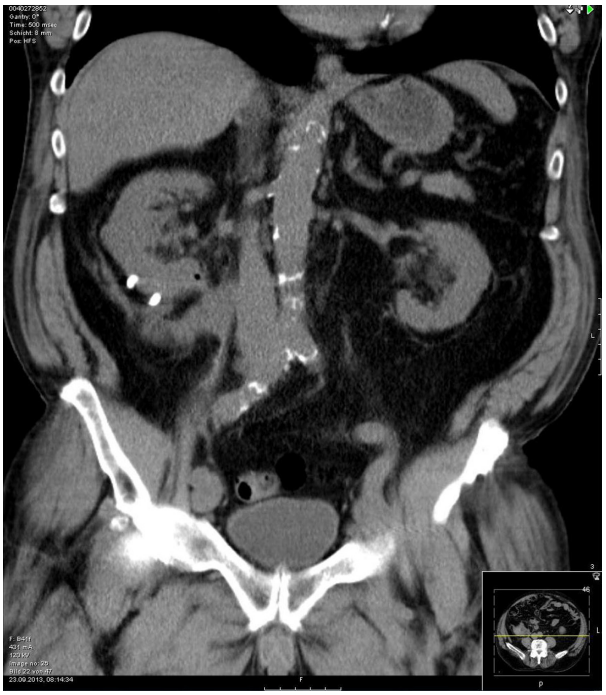

Figure 3. CT scan of hematoma after 2 weeks.

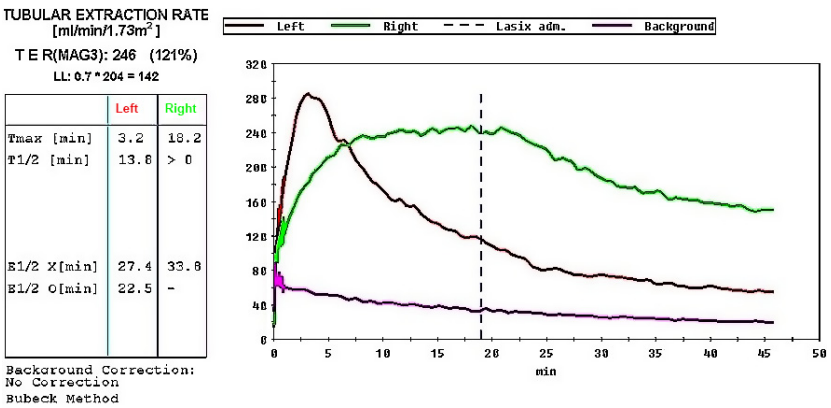

Figure 2. MAG3 Clearance.

Serum creatinine returned to normal values. Ureteral stenting or additional diagnostic was not necessary.

Discussion

Extracorporeal shock wave lithotripsy is still an effective treatment for renal calculi, depending on stone size and location. Major complications after treatment are rare. The incidence of perirenal hematoma varies depending on the lithotripter [6] and the diagnostic imaging used [9]. Several risk factors have been reported. Predisposing factors are hypertension, higher BMI, and age [6, 12]. The recommended treatment is conservative in most cases [9, 13]. Compression of the renal tissue may lead to Page kidney [14]. Evacuation of especially large hematomas could prevent impaired renal function and Page kidney. We showed a minimal invasive technique using CT-guided drainage and urokinase. The hematoma was solved after 2 weeks of treatment.

It was reported that conservative management of hematomas is also possible without adverse side effects regarding blood pressure or renal function even in long-term follow-up [15]. But without treatment, it will take several months, and most of the reported hematomas are much smaller [13].

For the first time, we present a structured implementation of a new method at the "Idea level" following the IDEAL recommendations [11]. In the next step, we plan consecutive prospective development in cohort studies.

Conclusion

This is to our knowledge the first case of minimal invasive successful evacuation of a large perirenal hematoma after extracorporeal shock wave lithotripsy with drainage and use of urokinase.

Authorship

SH: made treatment decisions and writing the manuscript; JP: performed the procedure as radiologist; JR: was involved in writing the manuscript and in making treatment decisions; and THE: involved in collecting data and was supervisor of writing the manuscript.

Conflict of Interest

None declared.

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