



Massive perinephric hematoma – A rare complication of extracorporeal shock wave lithotripsy

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ABSTRACT

Extracorporeal shock wave lithotripsy is commonly used to fragment renal calculi. This treatment modality is considered safe with minimal complications. We report a case of massive retroperitoneal hematoma following extracorporeal shock wave lithotripsy in a patient with no comorbidity and normal coagulation parameters. Patient was managed conservatively and had excellent recovery with normal renal function.

1. Introduction

Nephrolithiasis is a common disease encountered by urologists. Treatment of nephrolithiasis has changed drastically in last decades. Extracorporeal shock wave lithotripsy (ESWL), after making its entry in 1980s, is still being considered as least invasive treatment modality for nephrolithiasis. ESWL is usually a safe procedure associated with minimal complications that may be related to the formation and passage of fragments, infection or direct effect of shock wave on the renal tissue or surrounding organs.¹ Hematuria is the common sign of shock wave induced renal injury. Less than 1% of patients develop symptomatic subcapsular, intrarenal or perinephric hematoma.² Perinephric collections are usually small in size and resolve spontaneously in 6 weeks to 6 months without any morbidity. We report a case of large perinephric hematoma in a patient following ESWL that was managed conservatively without any morbidity.

2. Case presentation

We report a case of 48 year old male with no co morbidity, presenting with right sided renal pelvic calculus 1 × 1cm. With CT urography showing favorable renal Pelvicalyceal anatomy and stone density of 900HU, extracorporeal shock wave lithotripsy (ESWL) was planned. Sterile urine culture and normal coagulation parameters were documented before subjecting patient to ESWL. 1500 shocks were delivered

by Dornier human model-3 (electromagnetic generator) shockwave lithotripter. The procedure was uneventful initially. One day later patient landed in emergency with gross hematuria and right sided flank pain. Patient was hemodynamically stable and there was no abnormal color change or ecchymosis visible on the affected side. Laboratory parameters revealed a drop in hemoglobin from 11 gms to 9 gms. An ultrasound examination of the abdomen revealed a large perinephric hematoma 10 × 11 cms in size. A repeat Coagulogram and platelet count was normal. A CT scan with renal angiography was done that showed a large perinephric hematoma 11 × 11 cms in size. There was no evidence of active extravasation or pseudoaneurysm/arteriovenous malformation at the time of scan (Fig. 1 and 2). Patient was planned for conservative management with complete bed rest and analgesics to counter pain and inflammation. Serial monitoring of vital signs, hematuria, hemoglobin and hematocrit was done. Repeat renal ultrasound with doppler study was done after 48 hours which showed no increase in size of hematoma with good renal perfusion. Patient was discharged after four days in stable condition with complete resolution of hematuria. Patient was reviewed at one week, 4 weeks, 8 weeks and 12 weeks with renal ultrasound and doppler study each time to follow resolution of hematoma and to document renal perfusion parameters. A progressive decrease in the size of renal hematoma was seen. A final ultrasound after 4 months of ESWL showed complete resolution of hematoma with complete clearance of stone fragments. A Tc⁹⁹ DTPA renal scan at 4 months of ESWL showed normal renal function and drainage (figure-3). There was

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Fig. 1. Contrast CT, axial cut showing right sided large perinephric hematoma.



Fig. 2. Contrast CT coronal, cut showing right sided large perinephric hematoma.

no de novo hypertension documented in the patient during follow-up.

3. Discussion

ESWL has been considered as the least invasive treatment modality for nephrolithiasis with low rate of complications. Most of the complications requiring conservative management include transient hematuria, ureteric colic and urinary tract infection. However there are several case reports of major complications that require blood transfusion or surgical intervention. These major complications are the result of direct

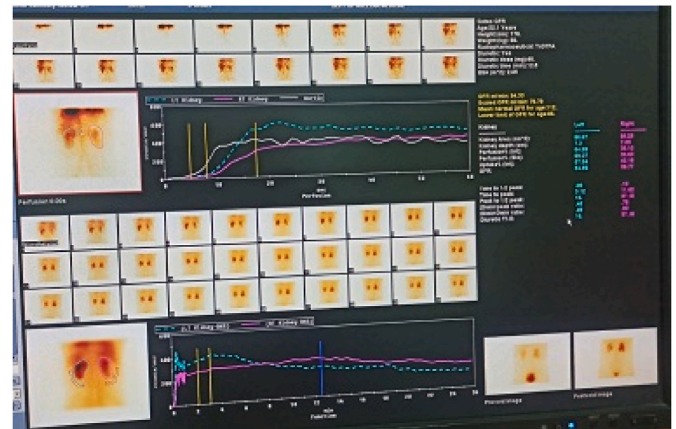


Fig. 3. DTPA showing normal renal perfusion with drainage.

effect of shockwave on the renal parenchyma and surrounding tissues and include kidney rupture, splenic or hepatic hematoma and hemorrhage.³ The most common hemorrhagic complication of ESWL is perinephric hematoma. The incidence of renal subcapsular and perirenal hematomas ranges from 0.1 to 0.6% when detected by ultrasound alone. But the incidence rises to 20–25% when CT or MRI is used to detect hematoma. Contrast CT with renal angiography, in addition to quantifying the hematoma will also detect any pseudoaneurysm, arteriovenous malformation or active extravasations. Several risk factors have been recognized that predispose to renal or Perinephric hematoma which include hypertension, diabetes mellitus, atherosclerosis, obesity, bleeding diathesis, male gender, old age and number of shocks received. Our patient did not appear to have any known risk factor for the development of perirenal hematoma.

Most of the patients present with flank pain and gross hematuria. Our patient presented with flank pain and gross hematuria. The degree of hematuria does not correlate with the extent of renal injury. Hematuria usually resolves within 24–48 hours. But persistent gross hematuria with drop in hemoglobin should raise the suspicion of more severe injury and warrant further evaluation.⁴ Our patient had persistent hematuria with drop in hemoglobin concentration from 11 to 9 g/dl, so contrast CT was done to quantify the renal injury and to identify the source of bleeding. Usually these are small subcapsular or perinephric hematomas that resolve spontaneously without major intervention. Our patient had 11 × 11cm hematoma and there was no active bleeding seen at the time of scan. Large hematomas with drop in hemoglobin usually respond to conservative management that includes watchful waiting, blood transfusion, and correction of coagulation parameters and continuous monitoring of vital signs. Our patient responded well to conservative management. Transarterial embolisation or surgical intervention is need in cases that have persistent bleeding with hypotensive shock that does not respond to repeated transfusion and other conservative treatments. Page kidney resulting from external compression usually by a chronic subcapsular hematoma is a rare cause of secondary hypertension mediated by renin-angiotensin-aldosterone system (RAAS). Kidneys are surrounded by a relatively tough capsule with no potential space between renal parenchyma and capsule. Even a small fluid collection under the capsule leads to considerable amount of compression. On the other hand perinephric space is spacious and surrounded by more pliable Gerotas fascia that can accommodate considerable amount of fluid before kidney parenchyma is compressed.⁵ Our patient had perinephric hematoma with normal perfusion documented on Doppler studies. There was no new onset of hypertension in our patient.

4. Conclusion

Large Perinephric hematoma following ESWL is a rare complication. Hemodynamically stable patients with no active extravagation or pseudoaneurysm/AV malformation, can be managed conservatively without loss of renal function.

Declaration of competing interest

None.

Acknowledgement

Nil.

Abbreviations

| | |
|------|-------------------------------------|
| AV | arteriovenous |
| CT | computed tomography |
| DTPA | diethylenetriamine pentaacetic acid |

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| ESWL | extracorporeal shockwave lithotripsy |
| HU | Hounsfield units |
| MRI | magnetic resonance imaging |
| RAAS | by renin-angiotensin-aldosterone system |

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