Case report

Incarcerated inguinal hernia-like spermatic cord hematoma and scrotal bruising resulting from an extracorporeal shock wave lithotripsy-induced subcapsular hematoma

Kuo-Chiang Chen a,b,c,*, Chih-Ming Lin a, Teh-Sheng Hsieh a, Shih-Feng Wang a, Wah-On Lo a

a Department of Urology, Cathay General Hospital, Taipei, Taiwan
b Graduate Institute of Nutrition and Food Sciences, Fu-Jen University, Taipei, Taiwan
c Graduate Institute of Basic Medicine, Fu-Jen University, Taipei, Taiwan

ABSTRACT

We report an uncommon acute complication after extracorporeal shock wave lithotripsy (ESWL). The patient developed a subcapsular hematoma of the kidney that presented as an ipsilateral incarcerated inguinal hernia-like spermatic cord hematoma and bilateral scrotal bruising. To the best of our knowledge, there have only been five published case reports in which scrotal bruising was a sign of a retroperitoneal hematoma following ESWL. We describe the first case of ESWL causing an incarcerated inguinal hernia-like spermatic hematoma, which led to a misdiagnosis of an incarcerated inguinal hernia.

1. Introduction

Extracorporeal shock-wave lithotripsy (ESWL) has been the treatment modality of first choice for renal and proximal ureteral calculi above 4 mm in diameter since the 1980s. The approximate incidence of ESWL-induced complications is from 3% to 7%, including tissue damage, infection, and stone-related complications.1–3 The most serious complication is hemorrhaging; cases of liver hematoma, splenic rupture, intra-abdominal hemorrhaging, and, most commonly, renal hematoma have been reported.1–3 We report a male with hypertension and diabetes mellitus (DM) who incurred an ipsilateral incarcerated inguinal hernia-like spermatic hematoma and bilateral scrotal bruising after ESWL. We pinpoint the risk factors associated with subcapsular hematoma formation following ESWL and discuss recommendations for preventing and managing such a complication.

2. Case report

A 53-year-old male had existing hypertension and DM. He was taking regular medication including valsartan–hydrochlorothiazide and glimepiride, and his diabetes had been well controlled for the past 8 years. He presented with left flank pain and hematuria. A 14 × 10-mm stone was observed at the left ureteropelvic junction (UPJ), following preliminary assessments and evaluation. In addition, renal ultrasound demonstrated significant hydronephrosis. The patient received ESWL as an outpatient, under intravenous anesthesia, in the standard supine position. A Dornier Lithotripter S II (Dornier, Wessling near Munich, Germany) was used to administer 3000 shock waves at 13.5 kV with a total energy of 81.13 J. The procedure lasted 55 min. After observation in the recovery room for 1 h, the patient was found to be stable, and he was allowed to return home.

Eighteen hours after ESWL, the patient first noted a swelling of his left scrotum together with a mass protruding from his groin. He visited his general physician complaining about the painful swollen left inguinal mass. Attempted manual reduction of the suspected left incarcerated inguinal hernia was unsuccessful, and the patient was referred to the Emergency Department for further management, arriving there 7 h after ESWL. Tachycardia (123 beats/minute) with a blood pressure of 85/145 mmHg and a normal body temperature were recorded. No black discoloration of the flank, loin, or scrotum was found on examination. With a presumed diagnosis of left incarcerated inguinal hernia, herniorrhaphy was urgently performed by a general surgeon. However, the operation revealed a diffuse spermatic cord hematoma extending from the...
Development of a perinephric hematoma is one of the most dramatic examples of damage to the kidney after ESWL treatment. These retroperitoneal hematomas vary from small subcapsular hematomas to large perirenal hematomas, and are one of the best recognized acute complications of ESWL.

Studies suggest that between 15% and 30% of patients routinely screened by CT or magnetic resonance imaging following ESWL have subcapsular, perirenal, or intraparenchymal hemorrhaging. However, clinically significant hemorrhaging that results in pain and bleeding is uncommon, occurring in fewer than 1% of post-ESWL patients. Although perirenal hematomas are uncommon, they are a significant complication because of the attendant risks, such as from blood transfusions, potential loss of renal function, and the possibility of renal-mediated hypertension.

Some possible predisposing risk factors appear to significantly increase the incidence of a subcapsular hematoma. The most prevalent of these factors is hypertension. It is believed that atherosclerosis of the renal vasculature caused by hypertension is associated with a loss of tensile strength of the vascular walls. This makes the vessel walls more vulnerable to the trauma caused by high-energy shock waves.

In a review of 4247 ESWL treatments, the overall incidence of perinephric hematoma was 0.54%, but in patients with preexisting hypertension, the incidence increased to 2.7%. There was a further increase to 3.4% in patients with poorly controlled hypertension and a pretreatment diastolic pressure in excess of 90 mmHg. Other risk factors associated with post-ESWL bleeding complications include coagulopathies and the use of anticoagulant agents. DM, age, coronary artery disease, obesity, positive urine culture pretreatment, and a higher number of shock waves also predispose patients to such a complication, although the evidence for these associations is not as strong.

A perirenal or subcapsular hematoma following ESWL can easily be overlooked by physicians. Flank pain following ESWL is often dismissed as pain secondary to the renal colic caused by passage of the stone fragments. However, persistent flank pain should alert physicians to the possibility of a perinephric hematoma, and evaluation by renal ultrasound is indicated. There have been only five case reports demonstrating scrotal bruising as a sign of retroperitoneal hematoma following ESWL. The first reported case of ESWL for a renal calculus causing a scrotal hematoma was described in 1994. The complication consisted of an acute retroperitoneal hemorrhage, with spread of the hematoma caudally through the inguinal canal leading to a scrotal hematoma. We describe here the first case of ESWL causing an incarcerated inguinal hernia-like spermatic hematoma, which was misdiagnosed as an incarcerated inguinal hernia. In our case, the inguinal hematoma developed prior to scrotal ecchymosis, and this was the cause of the misdiagnosis.

In a study of 3208 patients, post-ESWL pain and a decrease in hemoglobin greater than 2 g/dL were reliable predictors of a peri-nephric hematoma. It is suggested that all patients with a decrease in hemoglobin greater than 2 g/dL and intractable pain after ESWL should undergo ultrasound to rule out a perinephric hematoma. In the event of a positive finding by renal ultrasound, CT or magnetic resonance imaging can be performed to evaluate the size of the hematoma and the degree of parenchymal injury. In the above series, most of the patients were managed by closely monitoring their hemodynamic status. Intravenous fluid supplementation or a blood transfusion should be used if the patient becomes hypotensive or severely anemic. Pain control by narcotic analgesia is usually required. Transarterial embolization of the renal artery can be used to control severe or persistent renal hemorrhaging, and this eliminates the need for renal exploration and a possible nephrectomy.

Patients undergoing ESWL need to have any hypertension well controlled and a normal coagulation profile prior to the procedure. Patients should be informed of the risks of a post-ESWL perinephric hematoma, subsequent abscess formation, renal function impairment, and the development of hypertension. Physicians should be familiar with these post-ESWL complications and the possibility that they may present in an unusual manner. Regular follow-ups to measure the patient’s blood pressure are needed, and a CT scan should be performed 3–6 months after the episode, to confirm resolution of the hematoma. In addition, blood pressure needs to be closely followed to detect any new onset of hypertension.
4. Conclusion

It is rare for a patient to develop an ipsilateral incarcerated inguinal hernia-like spermatic hematoma and bilateral scrotal bruising after ESWL. The former physical sign can initially develop without the presence of scrotal bruising. Significant intractable flank pain in hypertensive patients who undergo ESWL with an inguinal or scrotal hematoma should alert physicians in the emergency, urology and general surgery departments to the possibility of perinephric bleeding. Awareness of such a complication in patients treated for renal or proximal ureteral calculi and appropriate examinations to determine any ipsilateral inguinal or scrotal hematoma should result in an early, accurate diagnosis and subsequent prompt and effective management.

References