SUBCAPSULAR HEMATOMA AS A COMPLICATION OF SWL: EXPERIENCE WITH THE STORZ SLX-F2 LITHOTRIPTER

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ABSTRACT
INTRODUCTION: Subcapsular and perinephric hematomas are a frequent and potentially serious complications of extracorporeal shock wave lithotripsy (SWL). Their incidence ranges between 0.2% and 25%, depending on the type of SWL energy source and the imaging technique used to detect the hematomas. We determined the incidence of and evaluated the risk factors for the development of clinically apparent post SWL renal hematomas with the latest generation shock wave lithotriptor.

METHODS: From April 2006 to September 2008, 3351 SWL treatments were performed using the Storz Modulith SLX-F2. Thirty-six % of the patients were female and 64% male, with a mean age of 53 (range 5-94) years. Data was collected prospectively for patient age, body mass index (BMI), gender, stone size, stone location, number of shock waves, energy level, shock frequency, medications and the existence of hypertension.

RESULTS: Following SWL treatment, 12 patients developed clinically apparent renal hematomas (severe flank pain, acute drop of hemoglobin level or acute raise in serum creatinine which prompted tomography or ultrasound) with an overall incidence of 0.3%. All patients were male, 8 (66%) of the affected patients had hypertension prior to the treatment, 6 (50%) had a stone in the lower calyx, 2 (17%) in upper calyx, 2 (17%) in the renal pelvis, 1 (8%) in mid calyx and 1 (8%) in the upper ureter. The mean energy level of 6.0 (5.0-9.0) in the patients with hematomas was significantly higher (p=0.0379) compared to that of the control cohort, which was 5.4 (0.5-9.0). Age, BMI, number of shock waves, shock wave frequency or stone size had no significant impact on the formation of the renal hematomas at the 0.05 level of significance. All patients with a hematoma were treated conservatively. One patient received a blood transfusion (4 units). The hematomas resolved in all patients without further treatment.

METHODS (continued)

RESULTS

<table>
<thead>
<tr>
<th>Risk Factor</th>
<th>P Value</th>
<th>Odds Ratio</th>
<th>CI 90%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Energy level &gt;5.5</td>
<td>0.037</td>
<td>10</td>
<td>1.50-66.64</td>
</tr>
<tr>
<td>DM</td>
<td>0.87</td>
<td>0.67</td>
<td>0.16-2.75</td>
</tr>
<tr>
<td>ASA</td>
<td>0.047</td>
<td>3.83</td>
<td>1.26-11.86</td>
</tr>
<tr>
<td>Clopidogrel</td>
<td>0.14</td>
<td>5</td>
<td>1.09-22.9</td>
</tr>
</tbody>
</table>

CONCLUSIONS

• The incidence of clinically relevant post SWL perirenal hematomas with the SLX-F2 is very low (0.3%).
• In our cohort the risk factors for developing a PSPH are:
  - Male gender
  - Energy level > 5.5
  - Use of NSAIDs, ASA or clopidogrel
• The use of different energy units among lithotripters makes comparisons difficult.
  - A possible unifying measure could be the use of energy flux density (mJ/mm²) since this measure provides information about the produced pressure in relation to the surface within the focal area.

REFERENCES