Renal Ultrasonography Lesson

The simple renal cyst

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Simple renal cysts are frequent, particularly in the elderly. Fifty per cent of individuals over 50 years of age have single or multiple cysts. Every cystic mass must be evaluated by sections in two planes. The examination must provide an exact evaluation of localization, form, size and structure.

The differentiation of simple renal cysts from acquired cystic renal disease will be discussed in the next contribution of this series.

Fig. 2. A cyst of the left kidney expanding into the renal sinus.

Fig. 1. (a) Typical appearance of a simple renal cyst at the upper pole of the right kidney. Note the hypoechogenic mass with through transmission, absent internal echoes and sharply demarcated posterior wall. (b) Indistinctly demarcated hypoechogenic mass at the upper pole of the left kidney. One year before it had been described as a cyst of small size. The final diagnosis was renal cell carcinoma.

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Fig. 3. Clearly delineated echolucent mass with through transmission, but also with internal echoes. (a) Circumscribed area of echosignals within an otherwise echolucent cyst. The final diagnosis was a haemorrhagic cyst. (b) An oval hypoechoic formation which had been present for several years but grown in size and increased in echogenicity. The final diagnosis was gelatinous carcinoma.

Fig. 4. (a) A hypoechoic renal mass in a patient with sudden onset of flank pain and macrohaematuria. (b) The CT-scan with contrast enhancement documents the presence of a cyst with high density (Hounsfield units corresponding to blood). (c) Same formation 2 days later, after another episode of macrohaematuria. (d) Same formation 3 weeks later. Note minute hypoechoic formation corresponding to a small residual cyst.
Table 1. Characteristics of benign and complex renal cysts

<table>
<thead>
<tr>
<th>Benign renal cyst</th>
<th>Complex renal cyst</th>
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<tbody>
<tr>
<td>Round or oval</td>
<td>Irregular contours</td>
</tr>
<tr>
<td>Echoluent</td>
<td>Variable echogenicity</td>
</tr>
<tr>
<td>Thin walled</td>
<td>Thick walled</td>
</tr>
<tr>
<td>Clearly delineated smooth contours</td>
<td>Ill defined irregular contours</td>
</tr>
<tr>
<td>Sharply demarcated posterior wall</td>
<td>Posterior wall not clearly demarcated</td>
</tr>
<tr>
<td>Sound wave amplification behind the cystic renal mass</td>
<td>No sound wave amplification behind the cystic renal mass*</td>
</tr>
<tr>
<td>Typical lateral extinction of the sound wave/ lateral shadowing</td>
<td>No lateral extinction of the sound wave/no lateral shadowing*</td>
</tr>
<tr>
<td>No calcification</td>
<td>Calcification*</td>
</tr>
<tr>
<td>No septa</td>
<td>Septa*</td>
</tr>
<tr>
<td>No Doppler signals from within the cyst</td>
<td>Doppler signals from within the cyst</td>
</tr>
</tbody>
</table>

* Not obligatory.

Table 2. The conditions which must be considered in the differential diagnosis of complex cysts

- Malignant tumour (renal cell carcinoma, oncocytoma, lymphoma, metastasis, …)
- Benign tumour (single or multiple)
- Haematoma (non-traumatic, traumatic)
- Abscess
- Hydatid cyst (echinococcus)
- Acquired cystic renal disease (in patients with primary renal disease and renal failure; see next article in this series)
- Pseudocyst (urinoma)

It is important to emphasize that not all complex cysts can be reliably be diagnosed using ultrasound alone. More definite studies, such as thin-cut CT (with enhancement), or MRT are then indicated.

Teaching points

1. Examine carefully every patient with renal cysts in order not to miss the diagnosis of malignancy.
2. In the symptomatic patient with cysts think of complications e.g. haemorrhage, abscess.

Suggested reading