Ultrasonic Diagnosis of Intrascrotal Contents

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As a routine we have used ultrasound in the diagnosis of intrascrotal diseases as well as in the diagnosis of the diseases of the prostate (Watanabe et al. 1974, 1975), the urinary bladder (Watanabe 1976) and the kidney (Watanabe et al. 1976). In this report, some results of the diagnosis of intrascrotal diseases by means of ultrasonography or the ultrasonic Doppler method will be described.

METHODS

Patients complaining of intrascrotal swelling were examined by ordinary contact compound scanning. The sonogram in patients with hydrocele showed no echo area inside the mass surrounded by a clear echo outline (Fig. 1), even when tested at high sensitivity levels. In patients with testicular tumor or orchitis, scattered echo patterns were obtained within the mass section (Fig. 2). Thus, hydrocele could easily be differentiated from the other diseases with solid tumors.

Patients with an acute scrotal condition were examined by the ultrasonic Doppler method. In these cases the affected testis was manually separated from the unaffected one. Jelly was used as a coupling medium. A transducer was placed on the scrotum, and its angle and position were adjusted until audible Doppler sound could be detected. Signals were recorded on tape and were later analyzed. In cases of testicular torsion no Doppler signal was obtained because of the interruption of the blood supply (Fig. 5). In patients with acute epididymitis the signal was easily audible and was augmented. The difference between the states could be distinguished simply.

Ultrasonograms were recorded by using the SSD-60 system (Aloka Co.) with 2.25 MHz ultrasound. For the detection of Doppler signals either a Doppler flowmeter 1935 (San-ei Sokki Co., 5 MHz ultrasound) or a Doppler Fetus Detecter FD 100 (Toitu Co., 2.5 MHz ultrasound) was used.

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RESULTS

From May, 1976 to January, 1977, nine patients with scrotal swelling were studied ultrasonographically. Six of them were diagnosed as testicular tumor and two as hydrocele. In the remaining patient, epididymal tuberculosis was strongly suspected because the sonogram indicated a pattern of several cysts inside a solid tumor on the epididymis (Fig. 3). In each case, a pathological evaluation was performed after surgical exploration. Detailed pathological results on the six patients diagnosed as testicular tumor by ultrasonography were as follows: Three teratomas, one seminoma, one Hodgkin disease (Fig. 4) and one chronic inflammatory change. No marked difference between them could be recognized on the ultrasonograms. The ultrasonic diagnoses were confirmed correctly in the other three cases.

During the same period, four patients were studied by the ultrasonic Doppler method. Two cases were diagnosed as testicular torsion and the others were
Fig. 3. Ultrasonogram of epididymal tuberculosis. Destructive intrascrotal mass with small cavities.

Fig. 4. Ultrasonogram of the testis of Hodgkin disease. Spermatic cord was diffusely infiltrated by the neoplasm.
Fig. 5. Upper tracing obtained from normal testis showed the presence of clear Doppler signals. Lower tracing was recorded from the distorted testis, which showed no Doppler signals.

<table>
<thead>
<tr>
<th>Patient</th>
<th>Duration of symptoms</th>
<th>Doppler signal</th>
<th>Diagnosis</th>
<th>Treatment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>N.Y. 26 2 hr</td>
<td>Rt.(+), Lt.(-)</td>
<td>Torsion</td>
<td>Detorsion</td>
<td>Recovered</td>
</tr>
<tr>
<td>2</td>
<td>Y.S. 16 5 months</td>
<td>Rt.(+), Lt.(-)</td>
<td>Torsion</td>
<td>Orchiectomy</td>
<td>Necrosis</td>
</tr>
<tr>
<td>3</td>
<td>M.T. 15 48 hr</td>
<td>Rt.(+), Lt.(#)</td>
<td>Epididymitis</td>
<td>Chemotherapy</td>
<td>Recovered</td>
</tr>
<tr>
<td>4</td>
<td>A.M. 15 10 days</td>
<td>Rt.(+), Lt.(#)</td>
<td>Epididymitis</td>
<td>Chemotherapy</td>
<td>Recovered</td>
</tr>
</tbody>
</table>

TABLE 1. *Ultrasonic examination in 4 patients suspected of testicular torsion*

Diagnosed as acute epididymitis (Table 1).

One of the patients with testicular torsion underwent surgery two hours after the first symptoms. A week after the surgery, clear Doppler signals revealing a recovery of blood supply were obtained from the damaged testis in this case.

The other patient had been treated for about six months in a different hospital under a misdiagnosis of acute epididymitis. The ultrasonic Doppler method indicated testicular torsion, and testicular necrosis due to the distorted spermatic cord was observed during surgery. Two cases diagnosed as acute epididymitis by the ultrasonic Doppler method were treated with drugs resulting in complete recovery.

**DISCUSSION**

A few diagnostic means have been used for determining intrascrotal contents. Almost all diagnostic information has derived from the clinical history and palpation. Ultrasonic examinations can provide interpretable information on intrascrotal disorders in more detail and in a visible way (Miskin et al. 1976).

Solid and cystic enlargements are easily and definitely differentiated by ultrasonography. The size, shape, and location of the abnormalities can be described.
It was difficult, however, to distinguish the histological differences in solid tumors.

Differential diagnosis between testicular torsion and acute epididymitis has been one of the most difficult problems. These two clinical conditions are frequently misdiagnosed. Since 1974, several authors have stated that the ultrasonic Doppler method is useful for the differential diagnosis of these conditions (Milleret and Liaras 1974; Bertram 1975; Pedersen et al. 1975).

The principle of the method is to detect the presence of the blood supply to the testis. In cases of testicular torsion, the blood supply is interrupted due to the distorted spermatic cord. Conversely, in cases of acute epididymitis the blood supply increases. Currently, the Doppler flowmeter or the Doppler stethoscope has been used for the purpose of differentiating the conditions, but we used the Foetal Heart Sound Detector which is more easily available in almost every gynaecological clinic, and we demonstrated that this simple instrument is sufficiently useful for the diagnosis of some acute scrotal conditions.

References