DUOLITH® SD1 »ultra«
Applied diagnostic ultrasound
Diagnostic ultrasound

Treatment

DUOLITH® SD1 »ultra« at a glance:
- Diagnosis and therapy in a single system
- B&W for standard examinations
- Colour Doppler
- Storage of ultrasound images directly in the patient management system
- Export of patient data to other media, e.g. PCs
- Documentation of patient data on a medical USB printer

Accurate diagnosis and localization of the indication are essential requirements to achieve optimum treatment outcomes. This is why STORZ MEDICAL offers optional on-board B&W or colour Doppler ultrasound imaging for its DUOLITH® SD1 »ultra« system. Diagnosis and therapy can thus be merged in a single system. The generous touch screen of the system monitor provides convenient visualization and control.

All common settings required for the localization of the treatment area and for its optimum visualization in the ultrasound image can be selected on the screen. Ultrasound images can be saved directly in the on-board patient management system and retrieved in later treatment sessions.

Examples of treatments are given below. It should be noted that the presettings can be adjusted to suit the patient’s specific requirements.

Further reading:
Matthias Beck, Shock Wave Therapy in Practice: Sonography and ESWT, LEVEL10 Buchverlag

Individual image enhancement

1. Press button 7 to access all major presettings.
2. To achieve an optimum ultrasound image, proceed to adjust the following values: focus, depth, dynamic range, power, gain, frequency, dynamic focus (plus number of focuses and focus set, if disabled), rejection, image enhancement and speckle reduction. These values can be found in the left control bar.
3. Press button 5 to access the time gain control (TGC) for further settings.
4. Press button 6 to access the palette (»gamma curve, colour, contrast«) for further settings.
5. Press button 1 to return to the left control bar.

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Application example 1 – shoulder joint standard plane

| Presettings          | 15 mm     | Dynamic focus | On | Depth | 40 mm     | Rejection | 10 | Dynamic range | 74 dB     | Image enhancement | 2 | Power | 32%     | Speckle reduction | PureView (PV) 4 | Gain | 86%     | TGC (button 5) | 33/62/59/53/59 | Frequency | 10 MHz | Palette (button 6) | Gamma 1 |
|----------------------|-----------|---------------|----|-------|-----------|-----------|----|----------------|-----------|-------------------|----|-------|----------|------------------|----------------|------|----------|-------------|-----------------|------------|--------|----------|-------------|----------------|-----------|

**Indications**
Visualization of the subacromial bursa and rotator cuff. Differentiation of degenerative changes and ruptures as well as calcific tendinitis.

**Patient positioning and technique**
The patient is seated, with the arm in a neutral position hanging freely by the side of the body. The therapist palpates the coracoid process and the ventral margin of the acromion. The ultrasound transducer is placed on the connecting line of these bony distance points. The examination starts in neutral position and is then complemented by dynamic scans of the shoulder joint in external and internal rotation. During external rotation, the tendon of the subscapular muscle is visualized. During internal rotation, the tendon of the supraspinatus muscle is displayed.

Application example 2 – elbow joint longitudinal scan

| Presettings          | 15 mm     | Dynamic focus | On | Depth | 40 mm     | Rejection | 10 | Dynamic range | 74 dB     | Image enhancement | 2 | Power | 32%     | Speckle reduction | PureView (PV) 4 | Gain | 86%     | TGC (button 5) | 33/62/59/53/59 | Frequency | 10 MHz | Palette (button 6) | Gamma 1 |
|----------------------|-----------|---------------|----|-------|-----------|-----------|----|----------------|-----------|-------------------|----|-------|----------|------------------|----------------|------|----------|-------------|-----------------|------------|--------|----------|-------------|-----------|

**Indications**
Visualization of inflammatory and degenerative changes in the CET (common extensor tendon) in radial epicondylopathy.

**Patient positioning and technique**
The patient places his/her arm on the examination table with the elbow flexed to 90° and the thumb pointing towards the ceiling (neutral position between supination and pronation). The therapist palpates the lateral humeral epicondyle and positions the ultrasound transducer, starting from the bony distance point and proceeding longitudinally over the forearm extensors. By additionally enabling the PDI mode, neovascularization in the tendinous tissue can be visualized to identify degenerative inflammatory changes in the CET.
Application examples

Application example 3 – Achilles tendon longitudinal scan

<table>
<thead>
<tr>
<th>Presettings</th>
<th>Focus</th>
<th>Dynamic focus</th>
<th>Depth</th>
<th>Rejection</th>
<th>Dynamic range</th>
<th>Image enhancement</th>
<th>Power</th>
<th>Speckle reduction</th>
<th>TGC (button 5)</th>
<th>Frequency</th>
<th>Dynamic focus</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>3 mm</td>
<td>On</td>
<td>30 mm</td>
<td>10</td>
<td>74 dB</td>
<td>2</td>
<td>55%</td>
<td>PureView (PV) 4</td>
<td>23/47/51/54/45</td>
<td>10 MHz</td>
<td>Gamma 2</td>
</tr>
</tbody>
</table>

Indications
Achillodynia, tenosynovitis, Achilles tendon rupture, Haglund’s deformity

Patient positioning and technique
The patient is in a prone position, with a support under the ankle so that the foot is in a relaxed position (no tension in Achilles tendon). The ultrasound transducer is placed directly above the Achilles tendon, proximally from the calcaneal tuberosity. By additionally enabling the PDI mode, neovascularization in the tendinous tissue can be visualized to identify degenerative inflammatory changes in the Achilles tendon. The grade of neovascularization should be established.

Application example 4 – infrapatellar longitudinal scan

<table>
<thead>
<tr>
<th>Presettings</th>
<th>Focus</th>
<th>Number of focuses</th>
<th>Dynamic range</th>
<th>Rejection</th>
<th>Power</th>
<th>Speckle reduction</th>
<th>TGC (button 5)</th>
<th>Frequency</th>
<th>Dynamic focus</th>
</tr>
</thead>
<tbody>
<tr>
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<td>0 – 50 mm</td>
<td>4</td>
<td>40 mm</td>
<td>2</td>
<td>43%</td>
<td>PureView (PV) 3</td>
<td>13/62/60/71/46</td>
<td>9 MHz</td>
<td>Gamma 2</td>
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</table>

Indications
Inflammatory and degenerative changes in the patellar ligament, Osgood-Schlatter syndrome, deep and superficial infrapatellar bursitis, Sinding-Larsen-Johansson syndrome

Patient positioning and technique
The patient is in a supine position with the knee flexed to 90°. The therapist positions the ultrasound transducer in a central position above the patellar ligament, initially trying to view the inferior margin of the patella. The transducer is then moved distally to scan the tibial tuberosity. The PDI mode can be used to diagnose neovascularization.