10.1 Standard Ultrasound Sectional Planes of the Ankle Joint and Foot

10.1.1 Standard Indications and Findings

Ultrasound of the ankle joint can detect intraarticular volume increases in the presence of effusion or synovialitis, as well as periarticular soft tissue changes. The most frequent indications for ultrasound examination of this joint are injuries and disorders of the Achilles tendon. Ultrasound can offer decisive additional information for the conservative treatment of Achilles tendon rupture. In addition to ruptures, inflammatory-degenerative changes of the Achilles tendon, such as Achillodynia and paracalcaneal inflammatory changes, can be sonographically detected. Changes of the plantar fasciitis following treatment with ESWT can be sonographically detected. A rupture of the anterior syndesmosis reveals a typical sonomorphological change. Table 10.1 lists general and rare indications for ultrasound examination of the ankle.

**Table 10.1. Typical indications and findings**

<table>
<thead>
<tr>
<th>Osseous destruction/lesion</th>
<th>Osteophyte</th>
<th>Plantar fasciitis – heel spur</th>
<th>Free arthropyles</th>
<th>Chondromatosis</th>
<th>Intraarticular volume increase</th>
<th>Bursitis</th>
<th>Peritendineum changes</th>
<th>Achilles</th>
<th>Achillodynia</th>
<th>Achilles tendon rupture</th>
<th>Anterior syndesmosis changes</th>
<th>Fibular band apparatus changes</th>
<th>Inflammatory-rheumatoid diseases</th>
<th>Fracture</th>
<th>Tumor</th>
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C. E. Bachmann et al., *ESWT and Ultrasound Imaging of the Musculoskeletal System* © Steinkopff Verlag Darmstadt 2001
10.1.2 Examination

For ultrasound examination of the ventral standard sectional planes, the patient is in the supine position. For ultrasound examination of the dorsal sectional planes, the patient is in the prone position. The patient’s feet, when in prone position, should extend beyond the examination table with the knee and hip joints in a neutral-zero position. The physician has a very good view of the gliding motion of the Achilles tendon using dynamic examination in the dorsal longitudinal sectional plane.

10.1.3 Standard Sectional Planes

For ultrasound images, the ankle joint is examined in three regions using five standard sectional planes. In the ventral and dorsal longitudinal region, the joint is imaged in two sectional planes that are almost vertical to each other; a diagonal sectional plane is used for the lateral region.

- **Ventral region**
  - Transverse sectional plane
  - Longitudinal sectional plane
- **Lateral region**
  - Diagonal sectional plane
- **Dorsal region**
  - Transverse sectional plane
  - Longitudinal sectional plane.
- **Plantar region**
  - Transverse sectional plane
  - Longitudinal sectional plane

If the finding is non-pathological, verification of two standard sectional planes is recommended:

- **Ventral region**
  - Longitudinal sectional plane
- **Dorsal Region**
  - Longitudinal sectional plane.

In the following, for each standard sectional plane, the transducer position, a standard ultrasound image and an explanatory diagram are presented.