Ultrasound of the Pelvis

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Ultrasound of the pelvis is indicated in cases with suspicion of pelvic fracture, pelvic pain, hind end lameness or poor performance. A complete ultrasound examination of the pelvis includes a transrectal and transcutaneous examination. A multifrequency rectal transducer is used for transrectal examination. The entire accessible surface of the pelvic canal should be evaluated. A repeatable systematic method is best for this examination and can be accomplished in multiple ways. The systematic method of scanning by anatomic region used by the author is explained in this text. However, there are multiple alternatives that would be equally effective, providing that all bony surfaces are properly examined.

Using this method, the pelvis is evaluated in the following order: ischium, pubis, acetabulum, ilium, sacrum, lumbosacral region and final sacroiliac region. The pelvic floor and acetabulums can be evaluated using the right or left arm. However, examination of the sacroiliac region requires that the left side be evaluated with the right arm, and the right side be evaluated with the left arm. Beginning at the dorsal surface of one tuber ischium, continuous scanning of the pelvis floor should be performed extending across the pelvis symphysis, the division between left and right pubic bones, until the entire left and right (sides of) ischium have been visualized. The examination should progress dorsally until the obturator foramen are identified and evaluated. At the dorsal extent of the obturator foramen the pubis will be visible as a narrow angular shaped bone. With the probe centered on the pubis and extended dorsally following the cranial pubis margin, the acetabulum can be identified. The acetabulum widens relative to the pubis and often extends beyond the probe dimensions requiring the probe to be moved in a cranial to caudal direction as it is moved dorsally to visualize the entire acetabular surface. The interior surface of the acetabulum, in the absence of bone damage, has a distinct vascular groove which can aid in identification of this region. Continuing dorsally along the osseous surface of the acetabulum, the probe will continue to the ventral surface of the ilium reaching ventral midline and the lumbosacral junction. In the region of the lumbosacral junction, the lumbosacral intervertebral disc, intertransverse lumbar joints, nerve root foramen and sacroiliac joints and be examined. The lumbosacral intervertebral disc has fibres that are curved to a variable degree when comparing different horses. The intervertebral disc, similar to the medial meniscus, may require multiple probe positions to create echogenicity through out the disc. The endplates should be evaluated for any signs of osseous remodeling. The intertransverse lumbar joints, nerve root foramen and sacroiliac joints have characteristic appearances and little to no difference should be appreciated between the left and right side in terms of symmetry. The sacroiliac joint can be most easily identified when the probe is moved away from midline at the level of S1 and the associated nerve root foramina. The probe position in this location places the sacrum cranial to the ilium. The osseous and soft tissue structures of the sacroiliac region can be evaluated.

The transcutaneous examination evaluates the coxofemoral joint, the dorsal ilial body and wing including the tuber sacrale and associated dorsal soft tissue structures as well as the tuber ishia. Clipping may be necessary to visualize fine details associated with the coxofemoral joint, depending on the condition of the hair coat and the body condition of the patient. A multifrequency macroconvex probe is typically used for this examination. Increased detail of the dorsal sacroiliac ligaments is achieved with a linear probe. Palpation of the greater trochanter should be performed which is then used for a landmark to image of the coxofemoral joint. Little to no difference should be appreciated between the left and right side in terms of symmetry, with proper probe positioning, and the smoothness of osseous surface.
The head of the femur creates a curved line in close apposition with the acetabulum. After the femoral head, neck, and acetabulum are visualized, the probe is passed laterally and dorsally to visualize the body of the ischium, the tuber coxae, and then across the ilial wing to the tuber sacrale. Similar to the rectal portion of the ultrasound examination, the ilium, tuber coxae, and tuber sacrale should exhibit symmetry, smooth periosteum, and an absence of defects in the body of the ischium. However, there are multiple vascular grooves on the dorsal surface of the ilial wings that should not be mistaken for fractures. The coxofemoral joint can be evaluated for peri-articular proliferation or other osseous remodeling affecting the femur or acetabulum, effusion, joint capsule thickening and enthesopathy.

Transcutaneous evaluation of the tuber ischii can be performed and the location of this bony prominence can typically be palpated directing probe placement. In cases with fracture of the tuber ischium, the unaffected side can be used to determine probe placement and similar positioning on the affected side can be used to demonstrate any abnormalities. The contour of the bony surface and the associated muscles should be evaluated.

Ultrasound of the pelvis is an effective method for imaging the accessible regions of the pelvis and can be performed in the field, as compared to obtaining radiographs of the pelvis which can challenging and are best performed under general anesthesia. A thorough evaluation of the contour of the osseous structures of the pelvis in conjunction with a consistent method are required to achieve an accurate diagnosis. There are marked limitations to this examination as many regions of the pelvis are not accessible, and this is an important consideration with negative studies, or those that do not correlate with clinical signs.