

A study of the anatomy and sonoanatomy of the bovine brachium

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The sonoanatomy to perform radial, ulnar, median and musculocutaneous (RUMM) nerves block is not well described in ruminants.

One calf (referred for euthanasia due to reasons unrelated to this study) was included. After sedation with xylazine (0.2 mg kg⁻¹ intramuscularly) the right brachium was scanned bilaterally using a linear ultrasound probe, oriented transversely to the humerus, and the images were recorded. Subsequently, ketamine (2 mg kg⁻¹ intravenously) was administered, and the RUMM nerves were injected with tissue dye (5 mL each; yellow, green, and blue for the radial, median/musculocutaneous, and ulnar nerves, respectively), using both ultrasound and peripheral nerve stimulation guidance, and the calf euthanized. In sequence, the arteries and veins were filled with red and blue latex, respectively. The calf was frozen, and transverse cross-sections (1 to 6) were performed along the brachium (Figure 1).

Each nerve was fully stained with the respective dye injected, tracing its trajectory from the distal to the proximal humerus. All main arteries of the forelimb were completely filled with red latex, while the main veins were completely filled with blue latex from cross-sections 1 to 4. Anatomical cross-sections 3, 4, and 5 were successfully correlated with the sonoanatomy; the RUMM nerves were identifiable through a single acoustic window from both the medial and lateral aspects.

In conclusion, the RUMM nerves were visible on ultrasound along the mid to proximal humerus in this calf, from either the lateral or medial side of the brachium. Further studies involving a larger sample size are needed to confirm the reproducibility of this technique.

Fig 1. (a) Anatomical cross-sections (white dashed lines numbered 1 to 6) performed on the right forelimb of a calf cadaver, lateral view. (b) Illustration of the same cross-sections shown on a drawing of a calf right forelimb skeleton (lateral view).