

6th CT-User Meeting

Joint venture:

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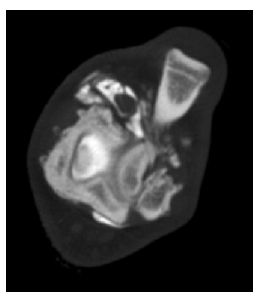
Theme:

Contrast Agents and Applications in Computed Tomography

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Proceedings

017 Intravenous vs. intra-arterial contrast enhanced CT in the equine head

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The anatomical complexity of the horse's head limits the abilities of radiography. Computed tomography (CT) in combination with contrast enhanced CT is more often used for diagnosing various head pathology in horses. However, little is known about the difference between intravenous and intra-arterial contrast-enhancement techniques for normal and abnormal contrast enhancement in the horse's head.

Comparing a continuous intra-arterial infusion protocol during scanning to a systemic intra-venous bolus protocol. It was hypothesised that; the IA contrast medium administration technique would result in a similar or higher contrast enhancement using a lower volume of contrast medium compared to the IV technique.

- Intra-arterial protocol used: an injection rate of 2 mL/s (total volume injected <180 mL) of Ioversol 350mgI/mL (Optiray®350) with a post-contrast scan delay of 3 s from the start of the contrast medium
- Intra-venous protocol used: 400 mL of Iobitridol 350mgI/mL (Xenetix®350) injected at a rate of 15 mL/s with a post-contrast scan initiated about 30s after the start of contrast medium administration

Compared to the pre-contrast studies, post-contrast studies showed significant contrast enhancement in the pituitary gland (IA: $p < 0.0001$; IV: $p < 0.0001$), IA nose septum ($p = 0.002$), nose mucosa (IA: $p < 0.0001$; IV: $p = 0.02$), parotid salivary gland (IA: $p < 0.0001$; IV $p < 0.0001$), cerebrum (IA: $p < 0.0001$; IV: $p < 0.0001$), rectus capitis muscle (IA: $p < 0.0001$; IV $p = 0.001$), IA temporal muscle ($p < 0.0001$), IA masseter muscle ($p < 0.0001$) and IV brainstem ($p = 0.01$). No significant contrast enhancement was seen in the eye (IA: $p = 0.23$; IV $p = 0.33$), tongue (IA $p = 0.2$; IV $p = 0.57$), IA brainstem ($p = 0.88$), IV nose septum ($p = 0.26$), IV temporal muscle ($p = 0.09$) and IV masseter muscle ($p = 0.46$). Three different categories of abnormal enhancement were detected: a strong vascularised mass, an enhanced rim surrounding an unenhanced structure and an inflamed anatomical structure with abnormal contrast enhancement.

Either protocol used in this study showed similar marked, mild or none obvious contrast enhancement depending on the reviewed structure. An advantage of IA contrast medium administration during CT studies is that similar contrast enhancement is achieved with less contrast medium compared to IV contrast administration, with the disadvantage of the presence of contrast streaming. A benefit of the IA technique is the ability to evaluate lesions characterised by increased blood flow. An advantage of the IV contrast medium administration in the cephalic vein is the symmetrical and homogenous enhancement, however timing is more crucial and the contrast dosage is more of influence in this protocol. And a potential benefit of the IV technique is the ability to evaluate lesions that are characterised by increased vascular permeability. Knowing the different normal contrast enhancement patterns of soft tissues will facilitate the recognition of abnormal contrast enhancements in the horse's head. Further research is needed to identify indications specifically profiting from either technique.