H90   Human or Non-Human: Identification of a Gastrointestinal Tract

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After attending this presentation, attendees will better understand the different examinations which are necessary to identify soft tissue remains found in the environment and will especially appreciate an easy way to distinguish between human and non-human soft tissue remains.

This presentation will impact the forensic science community by its detailed listing of identification methods referring to the differentiation between human and non-human origin of soft tissue remains.

Introduction: Whenever body remains are found in solitary places, a differentiation between human and non-human material can often be based on visual examination. While bone fragments might be easy to identify visually, soft tissue remains can be rather tricky. Internal organs such as liver, stomach, and bowels were found by a waterguard at the Greifensee in Zurich. A visual examination performed by a veterinary pathologist gave no further insight. Therefore, an identification procedure was implemented based on a Hexagon OBTI test, radiological examinations, and a mitochondrial cytochrome b test.

Materials and Methods: Computed Tomography (CT) scanning was performed on a 128-slice dual source scanner using 120kV with a slice thickness of 0.6mm and an increment of 0.4mm. Reconstructions were made in a soft tissue window with a soft kernel and osseous window with a hard kernel, respectively. Magnetic Resonance Imaging (MRI) was performed on a 3-Tesla magnetic resonance scanner. The performed T2-weighted and T1-weighted inversion recovery sequence parameters are 1.5mm using an XL-torso 16 elements phased-array coil and 2mm using a small-extremity 8 elements phased-array coil with a voxel size of 0.5mm respectively. A common Hexagon OBTI test device was used, which is usually developed for an immunochromatographic rapid test for confirming the presence of fecal occult blood. Mitochondrial cytochrome b test — this mtDNA-based species identification method consists of a multiplex-Polymerase Chain Reaction (PCR) -setup with eight primers varying in their specificity to amplify regions of the mitochondrial cytochrome b gene in different animal classes. After PCR and sequencing, which took approximately two days, the species in origin was identified using Basic Local Alignment Search Tool (BLAST) alignments to the cytochrome b entries in the National Center for Biotechnology Information (NCBI) nucleotide database.

Results: The Hexagon OBTI test showed a negative result for human blood. CT scanning and MRI did not give any specific information. The mitochondrial cytochrome b test showed a match of 99% to silurus glanis, an European wels catfish.

Conclusion: The Hexagon OBTI test devices were originally developed to detect the presence of human hemoglobin as a proof of blood in human stool samples. Because of its human specificity, these test devices are a quick and easy technique to distinguish between human and animal blood and could be used immediately where the remains were found; however, cross-reactions could be shown on samples of primates, mustelidae, and rabbits. Other providers also mentioned that ferret blood may lead to positive results. For a specific identification, the more time-consuming mitochondrial cytochrome b test is a suitable method for a broad spectrum of species.

Identification, Human or Non-Human, Hexagon-Obti-Test

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