H16 Microscopic Markers of Trauma in Decomposed Bone and Skin

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The goal of this presentation is to detect the vitality of soft tissue and bone lesions in an advanced state of decomposition using a monoclonal anti-human Glycophorine A antibody in order to evaluate the presence and distribution of blood cells.

This presentation will impact the forensic science community by showing an attempt at detecting a vital reaction in decomposed skin and bone in order to distinguish between antemortem and postmortem lesions in difficult situations.

The diagnosis of the vitality of a wound, or rather the identification of a vital reaction that enables one to differentiate an intravital wound from a postmortem wound, is a crucial issue in forensic pathology and more so in forensic anthropology. In fresh skin the macroscopic examination of hemorrhage infiltration can be sufficient to reveal the vitality of the wound but in many other cases histological and histochemical analyses are required. Bone injuries may follow similar "laws" as concerns the evolution of the macroscopic and histological picture.

The scope of this study was to detect the vitality of soft tissue and bone lesions in an advanced state of decomposition using a monoclonal anti-human Glycophorine A antibody in order to evaluate the presence and distribution of blood cells.

Six samples of bone fractures and two samples of skin wounds were taken from cadavers with a known time of survival between trauma and death, and then submitted to a simulated decomposition procedure. Negative controls were also included. The samples were left to decompose for 30 days in air and in water and analized at a time interval of 3-6-15 and 30 days. The bones were decalcified in a specific solution consisting of water, HCl, and Formic acid. Bone samples were stained with HE, Perls', PTAH, Weigert technique and PAS. Skin samples were stained with HE, Trichrome stain. Both bone and skin samples were stained with immunohistochemical technique. Skin and bone samples from four real cases of blunt and gunshot trauma were also included in the study.

Results showed, in the bone samples, red blood cell residues on the fractured margins and within Haversian canals may contribute to the diagnosis of a vital reaction. In the skin samples, red blood cells were visible until the 6th day in air and granular deposits of glycophorin reactive material after six days in air and in all samples in water. The general microscopic structure of bone was assessed in order to verify traumatic alterations in osteons.

In conclusion, this study may begin to shed some light on the issue of detecting a vital reaction in decomposed skin and bone in order to distinguish between antemortem and postmortem lesions in difficult situations.

Bone Fracture, haemorrhagic Infiltration, Glycophorine

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