In the frame of forensic anthropology, gross morphology of hyoid bone fractures may reflect a cause of death (accidental traumas, self-inflicted and assaulted injuries) as well as a mechanism of damage (perimortem vs postmortem fractures). The standard approach to examining macromorphology of the fractures in the forensic settings is a visual inspection in conjunction with traditional photography or RTG imaging. Recently, a variety of non-invasive virtual approaches have been made available and have been employed in such assessment \[3-5\]. Some of the advanced imaging techniques even allow as much as to examine the skeletal trauma on the microscopic level. Still, the amount of literature on microtraumas is scarce. To date, as few as three studies \[6-8\] aimed at evaluating characteristics of microfractures have been published. Recently, a variety of non-invasive virtual approaches have been developed through MUNI/A/1281/2014 and MUNI/A/1379/2015 projects. The present paper aims at exploring characteristics of peri-mortem and post-mortem fractures in hyoid bone by a variety of available traditional and advanced examination techniques on both macroscopic and microscopic level.

**Objectives**

The present paper aims at exploring characteristics of peri- and post-mortem fractures in hyoid bone by a variety of available traditional and advanced examination techniques on both macroscopic and microscopic level.

**Material & Methods & Results**

**Postmortem fracture**

**Bone tissue characteristic**

- fracture adjacent to the body presence of hypermineralised and bone tissue - layer of compact bone presence of bone trabeculae

- microfractures:
  - less frequent
  - branched and irregular progress mostly presented adjacent to the fracture surface

**Commonalities**

- microfractures occasionally intersect the osteons with similar radiodensity (older osteons)
- microfractures exceptionally intersect the osteons with lower radiodensity (younger osteons)

**Micro-CT**

GE v|tome|x L 240

- voxel resolution - 0.005 mm
- 502 slices

**Stereomicroscopy-based photography**

- Olympus SXZ 10 + Canon EOS 1100D

**Perimortem fracture**

**Bone tissue characteristic**

- fracture in the middle of the left greater horn - small number of osteons - high spatial resolution bone - more osteons of higher radiodensity

- microfractures:
  - numerous
  - long and rather uniform progress occasionally passing through the entire bone layer

**Commonalities**

- microfractures occasionally intersect the osteons with similar radiodensity (older osteons)
- microfractures exceptionally intersect the osteons with lower radiodensity (younger osteons)

**Micro-CT**

GE v|tome|x L 240

- voxel resolution - 0.01 mm
- 502 slices

**Stereomicroscopy-based photography**

- Olympus SXZ 10 + Canon EOS 1100D

**Material & Methods**

**Photography**

Nikon D7000 + Micro Nikon Comet

**SEM**

JEOL 6400 CF, scanning electron microscope

**RTG**

Handheld X-ray System Ariva XArm: Postmortem fracture

**References**


**Acknowledgements**

The authors are thankful to Central European Institute of Technology (Brno University of Technology, Czech Republic) for their assistance with micro-CT examination. The project was founded through MUNI/A/1281/2014 and MUNI/A/1379/2015 projects.