Paleoradiological analysis of Late Bronze Age urns from Croatia; 2017 findings

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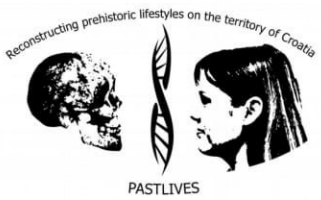

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Scopo:

Purpose was to non-invasevily analyse skeletal remains from Late Bronze age cremation Urns from archeological site Zapolje 2017, Croatia and to evaluate the use of double energy CT and UTE MRI sequence scanning in the analysis of cremains.

Materiali e metodi:

Three ancient cremated urns, excavated in 2017, have been scanned in University Hospital "Dubrava" on MDCT scaneer (Somatom AS+ 128, Siemens Healthcare,Erlangen Germany) using 0.6 mm slice thickness and double energy mode (80 and 140 kV). 3-dimensional, spoiled gradient echo based UTE images were acquired on a 1.5 - T scanner (Magnetom Avanto, Siemens Healthcare, Erlangen, Germany) with manufacturer's head coil. Echo time, repetition time and flip angle were 0.07 ms, 15ms and 45°, respectively. The 40000 radial projections used to reconstruct 256 slices of 1.3x1.3x1.3 mm3 isotropic resolution, resulted in an imaging time of 10 min per3D slab. Postprocessing was done with OsiriX 8.0 Imaging Software (Pixmeo, Geneve, Switzerland).

Risultati:

Acqusition of data created sets of 500-700 CT images per series and 256 MR images per series. Signal of MR images was high with good contrast resolution. No metal artifacts were found and burned skeletal elements were located on the bottom of the urn. Some grouping of large bones can be observed.

Conclusioni:

CT double energy scanning did not provide any extra information, and the contrast resolution was still inferior to contrast resolution on MR images. As in 2013 when MRI of ancient cremains was first time used in world of paleopathology by our group, UTE sequence provided again extra information during micro-excavation process. Clinical MRI in archeology is still under-used as it is not widely available to researches. We therefore suggest wider cooperation between archeologists and radiologists.

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