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Ordine provinciale dei Medici Chirurghi e degli Odontoiatri - L'AQUILA -

II MEETING NAZIONALE

Gruppo Italiano di Paleopatologia

L'AQUILA, AUDITORIUM DEL PARCO

31 OTTOBRE 2015 ore 9:00

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post-traumatic chronic pulpitis, due to the tusk fracture occurred during an accident or interspecies fights.
The histological exam excluded the involvement of granulomatous inflammation (e.g. tuberculosis) or neoplasia.
A disease process of at least several months in duration may be hypothesized, as suggested by the histologically visible bone remodeling. A long survival of the animal after tusk loss may also be supposed, since alteration of masticatory function with altered molar teeth consumption and postural changes (i.e. atlantoaxial fusion), resulting from asymmetric weight distribution, were observed.
In this study, the application of (paleo)histological techniques proved to be fundamental in order to establish the nature of bone lesions detected on archeological samples, also providing a good case for studying skull trauma and shedding light on the life history of these large mammals.

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Application of nanoparticles in consolidation treatments of archeological bones

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Archeological bones may undergo conservation treatments to reinforce their mechanical features and save these materials from decay or to allow the completion of research analyses. Nevertheless, the materials used for the conservation may produce alterations on the original find, negatively interfering on subsequent studies, such as bone surface topography as well as on the analysis of some components of the bone tissues (such as isotopes and DNA)[1]. The loss of mechanical properties is often caused by demineralization processes, so that one simple and compatible way to strengthen demineralized bones could be the in situ growth of calcium carbonate, in form of aragonite crystals - having strong mechanical strength thanks to their acicular shape. The in situ growth of aragonite crystals should be obtained, in the presence of collagen as template, from the reaction of calcium hydroxide nanoparticles (*nanolime*) with atmospheric CO_2, thanks to high reactivity and high penetration ability of the nanostructured particles[2].
Aim of the present work was to analyze the application of nanolime hydro-alcoholic suspensions on whole bones, recovered from Italian medieval necropolis (XIV-XV century). Nanolime was prepared in laboratory, by a patented method, which allows to obtain pure and crystalline nanoparticles by a time- and energy-saving procedure, able to be implemented for large productions[3]. Before and after the nanolime treatments, bones underwent digital radiography (DR), computed tomography (CT) scanning, stereomicroscopy (SM) and scanning electronic microscopy (SEM), X-ray diffraction (XRD) and DNA extraction too.
The investigations showed a penetration of the treatment inside the bones together to the filling of small pores as well as of superficial fractures, without any particular chromatic alteration. SEM images underlined the formation of a superficial thin film characterized by an acicular feature, corresponding to the aragonite growth (confirmed by XRD, showing the initial formation of aragonite crystalline phase).
Last but not at least, DNA extraction measurements put in evidence the conservation of DNA material itself after the nanolime treatments, underlying the interesting perspective of using calcium hydroxide nanoparticles in an eco-compatible consolidation of archeological bones.

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Enlarged vascular foramina and lytic lesions in vertebral bodies: a diagnostic dilemma

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Among the skeletal material from the sites of Alghero, Mesumundu and Sant'Antioco di Bisarcio (Sassari, Sardinia) and dated back to the period comprises between the 13th and the late 16th century 5 subadult individuals aged between 5 and 15 years and a mature male showed peculiar osteolytic phenomena of the vertebral bodies. These lesions have the appearance of enlarged vascular foramina, affecting several vertebrae mainly of the thoracic and lumbar spine, sometimes with involvement of the sacrum; on the same vertebral body several lesions are generally visible. In the literature similar features have been attributed to brucellosis or tuberculosis.
As for the Sardinian skeletal material, an imaging study on the vertebrae of the adult individual was carried out in order to evaluate the appearance of the lesions within the body. Computed Tomography evidenced internal irregular elongated cavitations, sometimes joined together; erosive rounded lesions, whose presence is not detectable externally, were also showed.

The molecular analysis has so far been performed on the subadult from Sant'Antioco di Bisarcio, but at initial analysis the DNA resulted degraded. Therefore, the nature of these lesions remains unclear, as it is not sure if they should be referred to tuberculosis, brucellosis or other pathological conditions [hemolytic anemias (eg. Thalassemia), lymphomas, multiple myeloma and infection by Echinococcus].
Further molecular analyses will be carried out on the remains belonging to the other five individuals in an attempt to clarify the etiology of the above mentioned lesions.

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Evidence of syphilis in a noble burial discovered in Piedmont dating back to the eighteenth century

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Ancient human remains were discovered in a burial context inside a crypt of the San Giovanni Battista church (Racconigi, Cuneo). No information is available about the origin of the burials or the dating of the bones. Historical documents suggest that the crypt dates back to when the church was built (1719-1730). The hypogeum has a roughly square shape. Access is through an opening in the ground floor of the church.
Anthropological analyses show that the bones belonged to four individuals in primary burials: three adults and one subadult. In particular, an adult (1/A) of indeterminable age was found prone and represented almost exclusively by the lower limbs; a subadult (2/A), aged 10- 13 years old, was found almost completely in a supine position; an adult male (3/A), aged 58-72 years old, that was skeletal in almost all districts even though only partially preserved, was found lying on his right side; an adult male (4/A) aged 58-72 years old, almost completely preserved, was found in a supine position. Some interesting paleopathological findings were observed, in particular, lesions reflecting treponematosis.
Macroscopic changes in the teeth and bones typical of venereal and congenital syphilis were detected in the two adults (1/A-/4A) and in the subadult (2/A). The most characteristic cranial lesion is the pattern of scarring (caries sicca) seen on the frontal bone of adult male 4/A. Deforming osteomyelitis of the tibia and fibula were observed in adult 1/A. Hutchinson's incisors were detected in subadult 2/A.
Although paleopathology must basically describe and observe rather than diagnose and deduce on the basis of the macroscopic examination of the skeletal remains alone, it is equally true that in certain cases, like in individual or privileged burials, one can very carefully attempt to achieve a conclusive view, as in this case.
Signs of an infectious disease, such as syphilis, were observed in three of the individuals that were found in the crypt of the Church in Racconigi and whom we may hypothesize were related to each other.

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The skulls of Borgo Cerreto (Perugia): medical, surgical, and anatomical activity of Baronio Vincenzi (XVII century)

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In the Sixties of the last century the vault of a 17th century private chapel was opened, revealing three isolated skulls with evidence of surgical and anatomical activity. The chapel was built by Baronio Vincenzi, who lived and practiced medicine in Borgo Cerreto, a village in the province of Perugia, between the 16th and the 17th century. The skull bc 01 belongs to an adult male, aged 25-35 years. It shows a hole on the left front-parietal region (30 x 31 mm), that can be identified as the result of a skull trepanation. The margins of the lesion are regularly smoothed and inclined internally and the diplopic tissues result almost completely obliterated by a cicatricial bone. A bone splinter (10 x 8 mm), completely reabsorbed, can be observed on the right side of the hole. These findings are the proof of a long survival of the subject. X-ray examination confirms a regular process of ossification, without infection. Trepanation was performed with a Hippocratic trypanon, largely used in cranial surgery of Modern Age. The specimen bc 02 is without skullcap and the right upper part of the face; it belongs to an adult male, 25-30 years aged. The cuts were produced by a bone saw with a thin blade. The choice of these regions suggests the willingness to study the basal skull, the right eye cavity and the paranasal sinuses. The skull bc 03 consists only in a skullcap of an adult individual, which shows the signs of a bone saw. In conclusion, the recovery of a trepanned skull, at present the first specimen of this type recovered so far in Umbria, together with two others skulls with the signs of post-mortem examination, inside the Vincenzi family vault can be probably related to the professional activity of Baronio. He was an experienced surgeon and a skilled anatomist, who certainly experienced the empirical surgery of the nearby surgical School of Preci, famous throughout Europe for the treatment of urinary bladder stones, cataract as well as the ability in skull trepanation.

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