STUDI ROMANI

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SOMMARIO

SAGGI E STUDI

Bioarchaeological and Paleopathological Analysis of a Burial from the Late Roman Necropolis of Pianotta di Calatabiano (CT, Sicily)

Introduction

This contribution focuses on the human osteological remains recovered from a tomb in the necropolis of Contrada Pianotta di Calatabiano (Catania, eastern Sicily). In antiquity, this fertile, water-rich land along the *Via Pompeia* connecting Messina to Syracuse was ideal for intensive agricultural exploitation.

In the 1990s this site was subjected to an early archaeological investigation that brought to light the ruins of the baths of a mid-imperial era-built *villa*, whose stratigraphy dated the ultimate abandonment of the site to theend of the 5th century AD. Between 2014 and 2015 the excavation of the necropolis[1] was carried out in an area that extends immediately north of the mouth of the river Fiumefreddo. The very existence of a monumental necropolis was clarified through the excavation of Trenches 1 and 2 which highlighted that the tombs were aligned and oriented along a north-south axis (fig. 1a). The sepulchral structure demonstrated in Trench 1 is similar to amonumental typology attested in numerous imperial-era suburban contexts in Italy and Sicily[2]: in particular, the building is akin to the type of numerous tombs investigated in 1959 in the northern cemetery of Catania[3]. In Trench 2, the remains of a nucleus made in *opus caementicium* were found: these belonged to a huge build-

[1] In 2014 and 2015, under the scientific leadership of the Superintendency of Catania and in collaboration with the University of Catania. Although numerous studies have been presented on the settlements and prestigious residences that characterized Late Roman Sicily, little is known still about the island's funerary landscape.

[2] R. J. A. Wilson, *Sicily under the Roman Empire*, Warminster 1990; for typologies of funerary Roman monuments vd. H. von Hesberg, *Monumenta. I sepolcri romani e la loro architettura*, Milano 1992, and I. Baldassarre - I. Bragantini - A. M. Dolciotti - C. Morselli - F. Taglietti, *Necropoli di Porto. Isola Sacra*, Roma 1996.

[3] E. Tortorici, *Catania antica. La carta archeologica*, Roma 2016, pp. 42-43; for a description of the podium-type tomb vd. J.M.C. Toynbee, *Death and burial in the Roman world*, Ithaca (N.Y.) 1971, pp. 131-132.

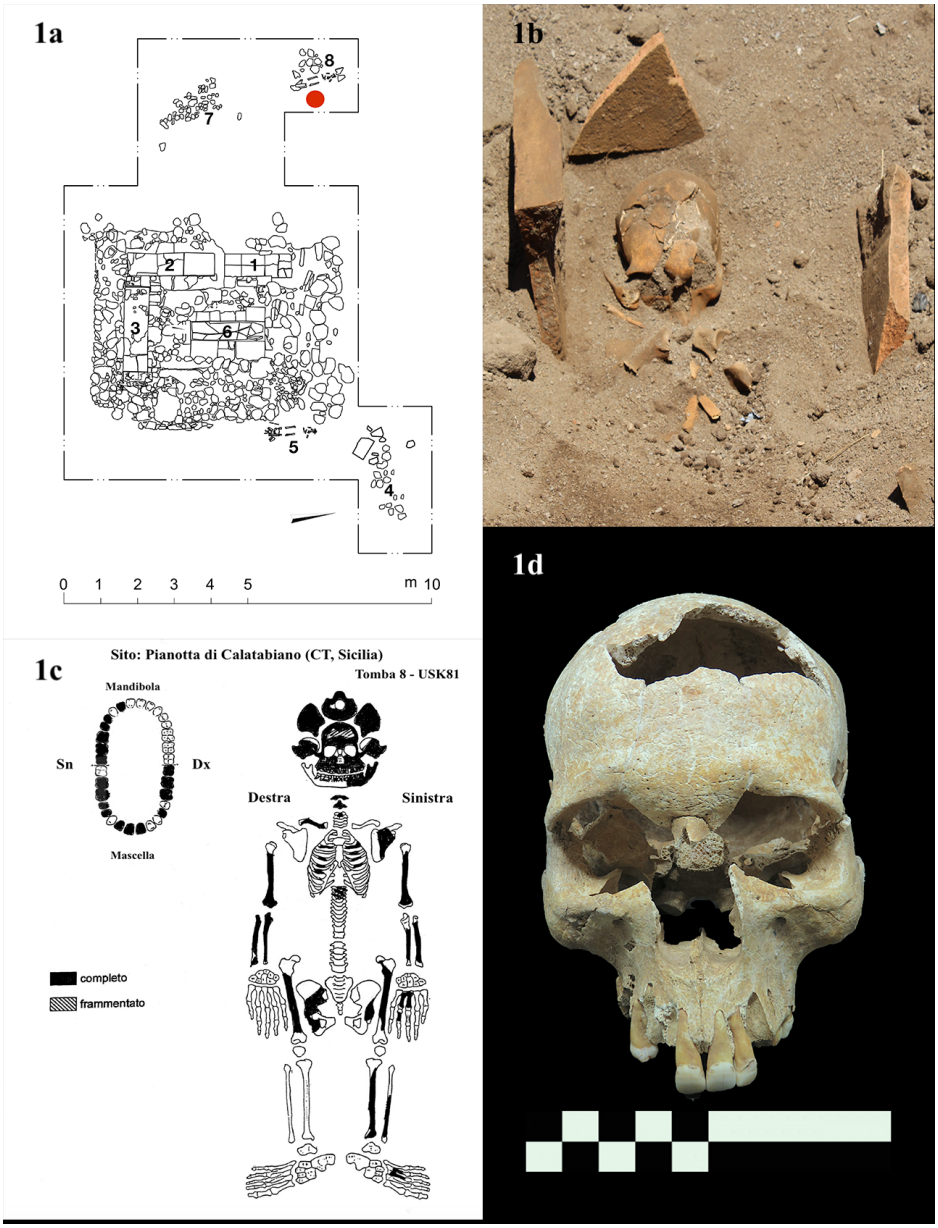

Fig 1 - a: Pianotta di Calatabiano: post-excavation plan of Trench 2 (drawn by R. Brancato and E. Tortorici). The dot indicates the location of Tomb 8; b: Detail of the burial during the excavation and after removing the tiles previously covering the skeleton at the cranio-cervical level; c: Coloured silhouette highlighting the skeleton's state of preservation; d: The skull following restoration.

ing (5.51 x 4.15 m) reminiscent of the podium-type tomb[4]. This is a further indication of the wealthy commission, probably from the owner (*dominus*) of the nearby villa[5]. The excavation of the necropolis yielded eight inhumation burials with a total of 25 individuals, including the one whose remains are presented here.

Materials and methods

The skeleton (labelled USK 81) discussed in this article comes from Tomb VIII (Trench 2, fig. 1b), a *cappuccina* single grave located just outside and west of the monumental cemetery complex excavated in 2017[6]. The chronology of this burial was primarily based on the archaeological record, but some additional insights were provided by the comparison with the radiocarbon dating of the nearby Tomb VII (418-536 AD – 1σ)[7]. The skeleton found inside lay in the supine position orientated north to south[8] and appeared covered by fragments of tiles (fig. 1b). Before its comprehensive analysis could begin, it was washed and restored. The anthropological study was performed using the methods collected by Buikstra & Ubelaker[9], while the paleopathological examination[10] was made combining macroscopic and radiological (i.e. X-ray

4 For example, vd. the Tomb of the Garlands in Pompeii located in Via dei Sepolcri outside the Herculaneum Gate (vd. V. L. Campbell, *The Tombs of Pompeii: Organization, Space, and Society*, New York-London 2015, p. 39).

5 F. Privitera, *Scavi e ricerche nei comuni di Calatabiano e Fiumefreddo in Sicilia e nella necropoli di Monte Iudica*, in «Kokalos», 43-44 (1997-1998) (2002), pp. 278-281, tav. LX- VIII, fig. 3.

6 The tomb had probably been looted in antiquity and some additional damage to it may well have been caused by agricultural activities since the place where it was excavated lies within a private property in the countryside.

7 Cf. E. Varotto - M. T. Magro - R. Brancato - C. Lubritto - L. Memeo - F. M. Galassi, *Unique Osteoid Osteoma of the Frontal Sinus from the Late Roman Empire*, in «Journal of Craniofacial Surgery», 30, 4 (2019), pp. 965-966.

8 North = skull, south = feet.

9 J. E. Buikstra - D. Ubelaker, *Standards for Data Collection from Human Skeletal Remains*, Arkansas Archeological Survey Research Series (44) 1994. For the analysis of musculoskeletal stress markers vd. V. Mariotti - F. Facchini - M. G. Belcastro, *The Study of Entheses: Proposal of a Standardised Scoring Method for Twenty-Three Entheses of the Postcranial Skeleton*, in «Collegium Antropologicum», 30, 1 (2007), pp. 291-313.

10 *Ortner's Identification of Pathological Conditions in Human Skeletal Remains*, 3rd edition, ed. J. E. Buikstra, London 2019.

imaging)[11] observations, which made possible a more in-depth appraisal of the lesions. Measurements were taken with a sliding caliper (Martin type), a spreading caliper and an osteometric board. A paleonutrional analysis was performed employing stable carbon ($\delta^{13}C$) and nitrogen ($\delta^{15}N$) isotopes, percentages of C and N, and the C/N ratio from one bone sample from the skeleton in Tomb VIII[12]. The obtained results were finally contextualized and interpreted through the clinical lens in order to reconstruct the health status of this ancient individual.

Results

The skeleton (fig. 1c)[13] belongs to a young adult male individual aged between 20 and 29 years at the time of death[14]. From the length of the right radius, his stature was estimated to be 160.7 cm[15]. This man was generally characterized by a medium to high muscular development and a squatting facet could be recorded on the left tibia.

Furthermore, several pathological traces were identified on this skeleton. In the skull (fig. 1d), a well-healed blunt-force oval-shaped trauma (sagittal diameter = 15.5 mm, transverse diameter = 16.4 mm, fig. 2a) can be seen on the posterior region of the left parietal bone. X-ray examination of the skull in latero-lateral projection (fig. 2b) confirmed the thickening of the diploic bone of the cranial vault that had already been noticed when the skull was

11 X-ray equipment and parameters: GMM Opera T90 ce; kV 60-70 mA 200 mS 100; images viewer: OsiriX MD Software version 11.0.3. The authors wish to express their gratitude to the staff of the Casa di Cura "Santa Lucia"- Centro Polidiagnostico, Siracusa (SR, Sicily) for their precious technical support.

12 Vd. M. A. Katzenberg, *Stable isotope analysis: a tool for studying past diet, demography,and life history*, in *Biological anthropology of the human skeleton*, eds. M. A. Katzenberg - S. R. Saunders, New York 2000, pp. 305-327. The authors thank Prof. Carmine Lubritto (Università degli Studi della Campania "Luigi Vanvitelli") for his paleonutritional analysis and helpful interpretative suggestions on this part of the study.

13 As can be seen from the silhouette, less than half of the skeleton is preserved, but the state of preservation of the recovered bones is fairly good.

14 This estimation was made considering dental development, degree of dental wear, degree of epiphyseal fusion, morphology of the iliac auricular surface (although part of it was missing), and closure of cranial sutures.

15 Standard deviation = ± 4.32 (using the Trotter and Gleser formula for white males, 1958). Cf. L. Ray, *Health and the Life Course at Herculaneum and Pompeii*, in *Health in Antiquity*, ed. H. King, London 2004, p. 85: the average stature of 169 cm calculated from the skeletons of male individuals found in Herculaneum and of 166 cm in Pompeii (AD 79, hence approximately over four centuries before the skeleton from Pianotta di Calatabiano).

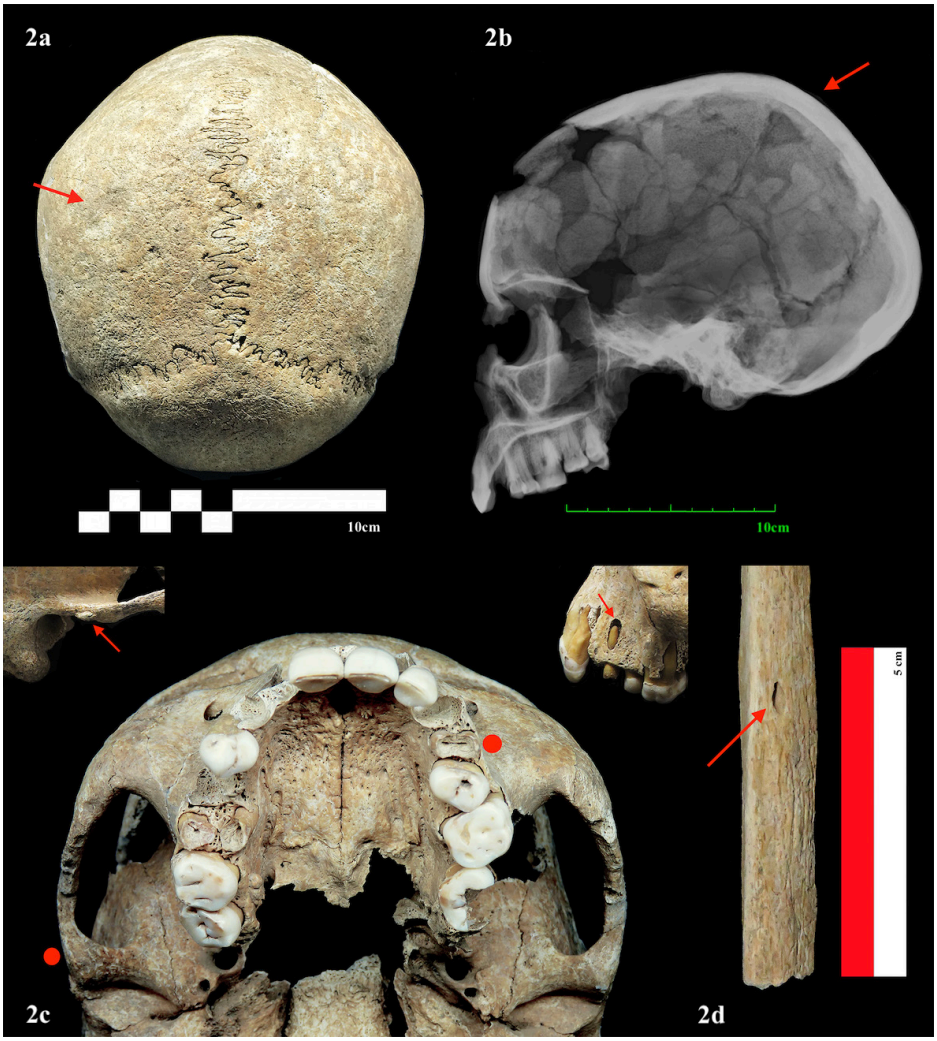

Fig 2 - a: Posterior view of the skull with a well-healed blunt-force oval-shaped trauma on the left parietal bone (arrow); b: X-ray image in latero-lateral projection of the skull. The arrow points to the diploic thickening of the cranial vault; c: Inferior view of the skull showing the individual's dental condition (maxillary region). The dots indicate the location of the lesions highlighted by the arrows. *Left arrow*: detail of the right zygomatic arch with new bone formation; *right arrow*: detail of an apical granuloma in the left first premolar; d: Mid-shaft of the left radius. The arrow indicates an oval-shaped osteolytic lesion.

still fragmented (thickness = 9.66 mm)[16]. Furthermore, the analysis of dentoalveolar diseases demonstrated the presence of varying degrees of caries in several teeth[17], of which the most severe ones are two maxillary caries with destructive lesions penetrating the pulp cavity, respectively in the right first molar and in the left first premolar. In these teeth, both affected by destructive caries, apical granulomata were detected (Fig. 2c). Some traces of dental calculus can be seen on both arcades, which show a mild alveolar resorption suggestive of periodontal disease, while a certain degree of porosity can be identified in the hard palate, as well as the malposition (rotation) of the maxillary left second premolar and of the mandibular left third molar. Linear enamel hypoplasia was also found on three maxillary incisors[18]. In addition, the examination of the skull allowed for the identification of a small lesion on the right zygomatic arch (sagittal diameter = 6.48 mm, transverse diameter = 4.61 mm) consisting of new bone formation compatible with an *intra-vitam* microtrauma (fig. 2c)[19].

Only minimal traces of osteoarthritis could be found on the distal articular surface of the radius and on its mid-shaft an oval-shaped cyst (sagittal diameter = 4.60 mm, transverse diameter = 0.19 mm, fig. 2d) was identified. Moreover, in the remains of the lower limbs it was possible to describe diffuse periostitis on the femora and the left tibia and fibula[20].

Finally, the paleonutritional analysis yielded the following results:

$\delta^{13}C$	$\delta^{15}N$	% C	%N	C/N
-20.0	7.9	11.4	4.1	3.3

16 In males the mean thickness of the skull at right euryon is 1.838 mm according to N. Lynnerup - J. G. Astrup - B. Sejrsen, *Thickness of the human cranial diploe in relation to age, sex and general body build*, in «Head and Face Medicine», 1 (2005), (art. 13, 7 pp), whereas the lateral cranial thickness is 4.33 mm according to H. H. De Boer - A. E. Van der Merwe - V. V. Soerdjbalie-Maikoe, *Human cranial vault thickness in a contemporary sample of 1097 autopsy cases: relation to body weight, stature, age, sex and ancestry*, in «International Journal of Legal Medicine», 130, 5, (2016), pp. 1371-1377.

17 Left maxillary hemiarcade: P1, P2, M1, M2; right maxillary hemiarcade: M1; left mandibular hemiarcade: M2.

18 Left maxillary hemiarcade: I1, I2; right hemiarcade: I1. Enamel hypoplasia represents a non-specific stress indicator that can be related to infectious diseases, nutritional stress, traumas, weaning, etc. Three episodes of stress induced these hypoplastic defects in this individual: the first happened when he was 2.5 years old, the second at about three years of age, and the third soon after he was 4.5 years old.

19 More likely than an osteoma, which has a much different morphology.

20 Grade 1.

They indicate that the individual's diet was determined to be primarily terrestrial and based on products of agro-pastoralism, hence consisting of vegetables with some occasional meat intake.

Discussion and conclusion

This comprehensive multidisciplinary analysis[21] demonstrates that this skeleton belonged to a male individual probably not enjoying a typical upper-crust social status, judging from his unpretentious tomb, his marked muscular development compatible with physical labour from a young age, as well as his meat-poor diet.

From the available skeletal remains, it is impossible to determine with certainty this individual's cause of death. Indeed, the interpersonal violence-related traumatic lesions that are present on his skull clearly have nothing to do with his demise, since they occurred long before it and probably had negligible consequences. Nonetheless, some considerations can be made on this ancient man's health status. In his childhood he was probably affected by episodes of stress and later in life he developed an inflammatory habitus, as evidenced by his periosteal lesions and poor oral health. Particularly the latter, characterized by several caries and granulomata, may well have resulted in life-threatening occurrences of sepsis/septicaemia. Additionally, the radiologically demonstrated pathological thickening of the diploic bone[22] may be related to anemic conditions such as iron-deficiency anemia, sick cell anemia, erythroblastic anemia, etc. Severe fatigue, cardiac complications as well as death are listed among the consequences of anemia[23], a disease which could also have represented a major risk factor in one of the septic scenarios described above.

Further analyses and the contextualization of this individual with the others from this necropolis currently being studied will increase our knowledge of the paleobiology and paleopathology of this important Roman settlement in Sicily.

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21 Limited only by the loss of considerable parts of the skeleton.

22 Cf. A. Schuller, *A Short Review of Cranial Hyperostoses*, in «Acta Radiologica», 34,4-5, (1950), pp. 361-373.

23 J. Turner - M. Parsi - M. Badireddy, *Anemia*, in StatPearls [Internet]. Treasure Island (FL): StatPearls Publishing; 2020 Jan. Available from: https://www.ncbi.nlm.nih.gov/books/NBK499994/.