

Paleopathology and functional anatomy evaluation of the *ex voto* of Veii preserved in Modena: historical context and possible interpretations

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Abstract: The Modena *ex-voto* collection represents a selection of materials coming from the conspicuous Lanciani Stipe and represent a formidable opportunity to observe the devotional phenomenon, being able to provide the visitor with a varied and complete taxonomy of cases and intentions. We have no concrete evidence to establish the real extent of the Etruscan knowledge of human anatomy. Some indications can be derived from a large number of *donaria* representing parts of the human body. Considering that Western medicine at the time based its anatomical knowledge on animal observation, the specific cultural level of the Etruscans seems in line with that of contemporary peoples, with whom they were in a relationship of mutual cultural exchange.

Keywords: Paleopathology, Etruscan, *ex voto*

Introduction and historical context

The offer of anatomical *ex voto* is one of the most significant material expressions related to the cult of *salus* since ancient times and it can express, on the one hand, the individual feeling but it also reflects the knowledge and beliefs of the population about the medical sphere. It should be pointed out at once that in order to arrive at a reasonable degree of certainty, with at least a plausible interpretation of these objects, an interdisciplinary approach is necessary to avoid dangerous methodological serializations, which often had nothing but the merit of muddying the waters and seeing the unseen (De Cazanove, 2014). Concerning the different possible interpretations of the uses of *ex voto* in the Etruscan context, it is possible to consider medical, individual and personal use. In fact, for greater knowledge in this field and the devices of care that were used, the Etruscans were considered the most religious men by important personalities such as the historian Tito Livio «*Gens itaque ante omnes alias eo magis*

dedita religionibus quod excelleret arte colendi eas (Livio) [...]». Precisely for this reason, it is worth spending a few words about the knowledge related to the scientific, anatomical, and, indeed, medical sphere of these people to reach at least a correct position within the medical practices of Etruscan society. Contemporary historical-medical treatises seem to agree that little is known about Etruscan medicine (Tabanelli, 1963; Sterpellone, 1990; Frati & Giulierini, 2002; Santoro, 2019). The limited information available comes from indirect sources, represented mostly by fragmentary news transmitted by Greek and Latin authors. This aspect suggests that Etruscan medical art was represented by a set of magical, hygienic, and empirical practices. Etruscans practiced divination and, as in all civilizations of the time, the medical profession coincided mainly with the magico-religious sphere. In this universe of superstition and magic, the priest-haruspex was likely to face also events such as trauma, infections, and other diseases. To treat them, he had to possess minimal knowledge of anatomy and pathophysiology,

acquired through direct observation in both immolated animals and in patients or derived from other people's experiences. Over time, the Etruscans developed medicine based on strictly natural remedies, such as medicinal plants and thermal waters, which were particularly abundant in their territory. Their ability to use medicinal herbs for wound care and healthy waters for the hygienic control of the environment, was handed down to Roman civilization, that received from the Etruscans the first rudiments of public hygiene and the first health laws (Sterpellone, 1990). The study field in which the Etruscans excelled particularly was, as we would call it today, dentistry. The numerous osteological evidence from the Etruscan necropolis is a valuable source of information about dental diseases and the solutions implemented to remedy their outcomes. Several studies on osteoarchaeological samples indicate a low prevalence of dental caries and abscesses in the Etruscan populations (Masotti et al., 2013). Still, it is challenging to discern how much these characteristics have depended on the abilities of the health professionals or instead on the general state of health and diet of the population (Brothwell & Carr, 1962, Fornaciari et al., 1985, Menconi & Fornaciari, 1985; Masotti et al., 2013). The considerable expertise of the Etruscans in metallurgy fully justifies their recognized ability to prepare dentures. These were used both for the replacement of missing elements and for stabilizing faltering teeth. While it is legitimate to doubt the effectiveness of such devices in restoring mastication function, their use indeed denotes clear attention to the aesthetics and implies a specific knowledge of the mastication apparatus. The sphere of motherhood and childhood, so closely connected with the survival of communities, was another fundamental interest of Etruscan society. Since the first health legislation passed in Rome, with an evident Etruscan influence, particular attention has emerged to protect the unborn child and a firm condemnation of abortion. The numerous representations of the protective deities of fertility and childhood and the large number of ex-votos connected to them help to reconstruct quite accurately the importance attributed to all the phenomena related to fertility and reproduction. We have no concrete evidence to establish the real extent of the Etruscan knowledge of human anatomy. Some indications can be derived from a large

number of *donaria* representing parts of the human body. The many inaccuracies found in the most significant specimens indicate a remarkable approximation in the general morphology of the organs to such an extent that they are challenging to recognize or ascribe to domestic or sacrificial animals. Considering that Western medicine at the time based its anatomical knowledge on animal observation, the specific cultural level of the Etruscans seems in line with that of contemporary peoples, with whom they were in a relationship of mutual cultural exchange (Cucina et al., 2016). The lack of written sources on the health conditions of the Etruscans was partially replaced by archeological findings which have allowed the elaboration of limited diagnostic assumptions in the figurative arts field. Instead, more scientific evidence is continually emerging from anthropological and paleopathological analyses of human remains, allowing us to trace a certain paleodemographic and epidemiological trajectory. At the same time, this knowledge provided a taxonomy in terms of pathologies and functional adaptations which have occurred in this ancient population.

Current paleopathological knowledge

The mortality pattern observed in the various necropolis involved in paleopathological and bioanthropological studies (necropolis of Vallerano San Donato and Bivio, Quadrella, Vicenne-Campochiaro, Pontecagnano), is generally characterized by a relatively low age at death compared to the present life expectancy, is typical of pre-industrial populations (Belcastro et al., 2007; Paine et al., 2009; Novak & Šlaus 2010; Cucina et al., 2016). However, it is not uncommon to intercept deaths among more mature adults over 50 years old, indicating a relatively good quality of life for the Etruscan populations investigated (Petrone, 1994; Rubini et al., 1999). It was also possible to identify some skeletal lesions (e.g., porous hyperostosis, appendicular periostitis, Schmorl hernias) in the male population that seems to outnumber, although slightly, the female individuals, in which different skeletal modifications were observed (*cribra orbitalia*, internal frontal hyperostosis, osteoarthritis of the spine). Some pathological frameworks are easily attributable to different

occupations that men and women were called to carry out within the Etruscan society (Manzon & Gualdi Russo, 2016). However, porotic hyperostosis deserves various considerations, a pathological condition that generates minute perforations in the cranial theca and an increase in thickness of the underlying diploe and that is often associated with functional hyperplasia of the bone marrow. It is caused by several factors, such as genetic anemia, iron deficiency anemia, some nutritional deficiencies such as vitamins A, B12, B6, C, D, folic acid, chronic diarrhea, some parasite infections, numerous pregnancies (Lallo et al., 1977; Facchini et al., 2004; Mosothwane & Steyn, 2009; Walke et al., 2009). The lesions produced by porotic hyperostosis, which are located in the superior part of the orbit, or *cribra orbitalia*, and on the cranial arch, or *cribra cranii*, may reveal an ancient and strong link between the different haemoglobinopathies and malaria, for example (Viganò et al., 2017).

Genetic studies have demonstrated an association between malaria and thalassaemia (Clegg & Weatherall 1999; Viganó et al., 2017), for which there are currently hundreds of mutations in gene groups that control the production of haemoglobin chains. For this reason, in the regions historically and endemically affected by malaria, various haemoglobinopathies are common, among which we can mention thalassemsias in the Mediterranean basin and sickle cell anemia in Africa. This was because the advantageous relationship that binds these two different diseases, thalassaemia and malaria, the first one genetic and the second one infectious, stems from the fact that the thalassaemic subject could catch malaria more easily than a normal individual. Here, then, on a territory certainly affected in an endemic way by malaria, as what was to be the current Italian regions of Lazio, the lower Tuscany, and Campania, the high incidence of porotic hyperostosis on the ancient sample indirectly represents a functional adaptation to malaria (Fig. 1). Zoonoses, infections or diseases that are transmitted directly or indirectly between animals and humans, thus making a leap of species, for example through the consumption of contaminated food or contact with infected animals, are a major issue. It is known from written sources, archaeological finds, and the extensive iconographic repertoire associated with historical artistic production, that

the Etruscans systematically dedicated themselves to the breeding of pigs, oxen, sheep and goats, and agricultural use of animals such as donkeys, horses, and oxen (Barker, 1987; Jannot, 1995). Precisely this daily coexistence, determined by the new sedentary pattern of the human populations after the Neolithic revolution and the spread of agriculture, was characterized by a significant and underestimated proliferation of zoonotic infections, such as brucellosis or tuberculosis.

If bioanthropological and paleopathological studies still fail to intercept bone lesions attributable to these diseases, it has often been the latest molecular research to identify the genetic traces of these serious pathologies on ancient human remains (Gutierrez et al., 2005; Monot et al., 2009).

Tuberculosis seems to have had a solid presence in the Etruscan population, both in its rarest extra-pulmonary form (Formicola et al., 1987; Canci et al., 1996; Pietrangelo & D’Anastasio, 1997; Canci et al., 2001; Sallustio et al., 2004; Rubini et al., 2014) and in pulmonary form, widely infectious but often osteologically silent. After trying to describe the social and



Figure 1. Identification of malarial areas along the Italian peninsula in accordance with the “Malarial Map of Italy” drawn up by Luigi Torelli in 1882, Sardinia, although not highlighted, is to be considered almost entirely afflicted by the presence of protozoal parasites of the genus *Plasmodium*.

scientific background, limitations, and potential of the approach used, we come to a few considerations about the Modena collection, currently subject of a complete scientific and rearrangement review on the occasion of an important thematic exhibition.

Materials

The Modena *ex-voto* collection represents a selection of materials coming from the conspicuous Lanciani Stipe and, in consideration of this aspect, it is not possible to derive statistically valid palaeodemographic considerations, not representing the collection the entire recovered deposit. The context of the discovery of the Lanciani Stipe is Veii, one of the most important cities of southern Etruria, near Rome. The excavations that brought to light the immense votive deposit of Veii, from which the selection of Modena comes, were started in 1889 thanks to the interest of Teresa Cristina of Bourbon, daughter of Francesco I of Bourbon, king of the two Sicilies. The selection of *Veii's ex votos*, which will later make up the Lanciani Stipe, will become part of the Civic Museum of Modena in 1894, thanks to the interest of the astronomer Pietro Tacchini (Bartoloni & Benedettini, 2011; Michetti, 2022). The ancient anatomical *ex-voto* of Modena represent, however, a formidable opportunity to observe the devotional phenomenon, being able to provide the visitor with a varied and complete taxonomy of cases and intentions.

Discussion

Specimens with inventory numbers 69, 70, 71, and 72 represent lower limbs or parts thereof; the plastic yield is appreciable and adheres to the normal anatomy of these districts, not without a certain degree of stylization, which makes it impossible to highlight the specific pathological stigmata. It is therefore probable that, as mentioned above, we are faced with a reliance on a journey to be undertaken or a thanks for a return. More difficult, but not excluded, it can be suggested a claim of *sanatio*, which may have been motivated by osteoarticular or inflammatory causes, such as tibial

periostitis, supported also by the Etruscan clothing that tended to leave the lower limbs uncovered. On the other hand, the cause of osteoarthritis, which generally affects the senile phase of life, which, as we have seen, was reached less frequently than today, could be cautiously excluded. Instead, we have no leverage to assume healing from traumatic events such as fractures or sprains events. The *ex voto* n.73, represented by an arm, reflects a fairly simplified anatomical model, in particular with regards to the hand of the yield. In addition, in this case, the considerations expressed before for the lower districts apply; we refer it to the osteoarticular framework of the elbow joint, anatomically rather complex, composed of three joints incorporated in a single capsule. The representations of ears n. 89 and 90 may be related to requests for listening; on it, we can find a good anatomy of the helix, of its pit, and of the external helix. Finds n. 95 is a plaque depicting the upper half of a face with the eyes and nose. Along with votive masks, plaques can be considered a reduced version - and thus less expensive - of isolated heads, with which they share the interpretative uncertainties. According to a symbolic explanation, the eyes might represent a request for attention from the deity as well as the request to be heard implied by the ear votives. It is harder, if not impossible, to support the presence of strabismus, the evaluation of which is negatively affected by the lack of chromatism.

The small series of breasts (n. 91 and 92), rather stylized, are probably related to fertility desires, expressed through an almost symbolic and simplified representation, without any particular reference to pathologies suffered or injuries. Remaining in the field of fertility, we can certainly count the representations of phalli n. 96, 97, and 98, although they could also have a value related to the *sanatio*. Three cases of phimosis are depicted and, in the case of *ex voto* n. 97, tight phimosis is shown, which certainly caused some sort of disorder. The two ciabatta uteri, characterized by deep transverse striations, refer to the same desire. In both cases, the plastic efficiency of the surface of the uterine body could refer to the attempt to depict the muscular coat and. In the case of *ex voto* n. 85, the lateral pyriform appendix could remind the bladder (Fig. 2). In both cases, there are no pathological indicators that may refer to the *sanatio* sphere. The *ex voto* n. 83



Figure 2. Probable uterus represented by the ex voto n.85, in its frontal view; the red rectangle frames what appears to be the bladder.

and 84, refer to the anatomy of the urinary bladder that, although simplistically represented, has some relevance to reality. For bladder n. 83, the median umbilical ligament on its surface could be depicted (Fig. 3). Anatomically unrecognizable are the little cippi n. 80, 81, and 82, on which it is difficult to evaluate the morphofunctional type, even less pathological. In these cases, the high degree of stylization and the loss of any anatomical points might refer to a standard formulation and production of these artifacts, on which the value of the offer was higher than the effective representation. Although suggestive, the attribution of the little cippi to human hearts remains to be checked with other and broader comparisons; it is inferred for stylistic similarity from polyvisceral plaques and torsos, which in some specimens tend to depict the heart as a cone divided into segments.

The polyvisceral tablet n. 87 (Fig. 4) represents a kind of salutary *ex-voto* widely spread in the sites of southern Etruria. The circumscribed territorial attestation can be related to the remarkable prevalence in the area of malarial fevers, that in the acute phase affect the internal organs electively. In this particular case, the oval morphology of the object distinguishes

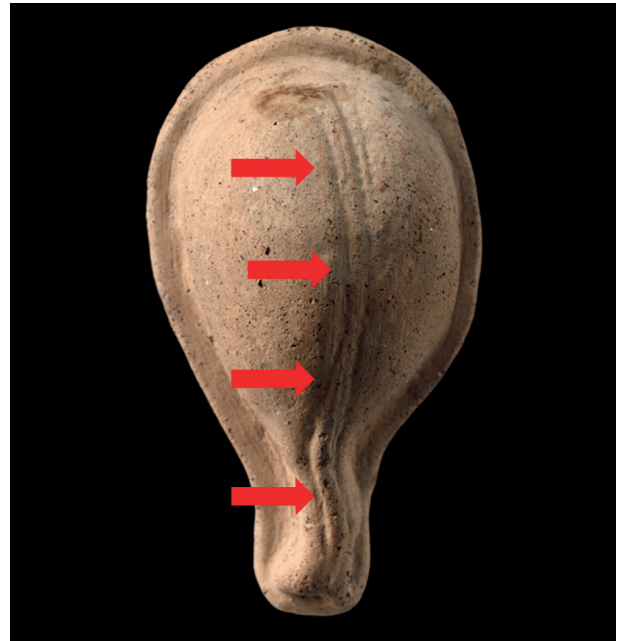


Figure 3. Probable bladder represented by the ex voto n. 83 in frontal view; arrows indicate the molding that could represent the median umbilical ligament.

it from the so-called packet polyviscerals, to which the three-dimensional plastic gives more realistic details. Like the latter, polyvisceral tablets are reproductions of the internal organs based on animal anatomy, oth-



Figure 4. Ex voto n. 87, polyvisceral representation, with vaguely anatomical connotations.

erwise the result of merely imaginative reconstructions (Fenelli, 1995).

The n. 75-79 include headless and armless human trunks of variable length in which the attention to the details varies from one another. The headless and armless torso n. 75 impresses for the extremely brief representation, in which the recognition of the anterior topography is facilitated by the presence of highly stylized nipples and navel. Among these, we note a median oval opening, from which partly unidentifiable viscera emerge. The position of the opening seems unusual (placed in cranial position) when compared to similar objects, in which the hypothetical laparotomy cut assumes a xipho-pubic direction. In both finds n. 77-78 a headless trunk with the roots of the upper and lower limbs is depicted. In the first case, it is characterized by a discreet plastic representation; the external genitals allow to determine the female sex of the individual, the xipho-pubic incision allows to see internal organs defined in detail that are characterized by a far-fetched topographic localization if the block of the thoracic organs occupies the epi-mesogastric region. The second case, devoid of sufficient sexual characterization, shows a marked simplification of the external surfaces and the visible organs through the laparotomic section that simulates a xipho-umbilical trend. The *ex voto* n. 79 instead consists of a male headless trunk with the roots of the upper and lower limbs, without any laparotomic incision. The only element that departs from normal anatomical morphology is represented by three parallel horizontal reliefs located in the sternal region, which seem to connect the two mammary areas. The absence of correlations in the consulted documentation prevents a clear symbolic connotation of these elements and strongly limits any pathological interpretation. Wanting to fall into the temptations of iconodiagnostics, we could propose the possibility of sores or keloids of the skin, if not even urge us to speculate about the possibility of *pectus excavatum*. All this while remaining aware of the already well-stated limitations that must be imposed in the interpretation of this particular category of materials. In conclusion, we can state that the scientific review of museum collections, in the light of the new knowledge that literature offers us, and the restitution that is made of them through thematic and interdisciplinary

exhibitions such as the one in Modena entitled “*DeVoti Etruschi, La riscoperta della raccolta di Veio del Museo Civico di Modena*.” Modena Civic Museum, 18 December 2022 - 17 December 2023 “ currently underway, allows us to provide new elements of knowledge and understanding about the populations of the past.

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