

SEVERE NON-SPECIFIC INFECTIOUS PROCESSES FROM LATE MEDIEVAL PERIOD (Portugal)

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ABSTRACT: *We report some pathological cases affecting two late medieval individuals coming from necropolises located in the North of Portugal.*

The first case refers to a male individual, recovered at the church of S. João Baptista at Carrazeda de Ansiães, who died, probably, during his fifties. He presents a surface inflammation, or periostitis of tibiae, fibulae and femurs. We are in the presence of a significant inflammation involving multiple elements, which is in relation with a widespread and systemic infectious process. The clear signs of maxillary sinusitis as well as the acute palatal infection confirm the general state of infection.

The second case reports to the skeletal remains of a female exhumed from the medieval necropolis of S. Pedro at the site of Castelo de Numão. This woman shows in her skeleton, an advanced and unusual ossification affecting some ribs. There is bone growth in the insertion area of the deltoid on the right humerus. There are also exostosis in the insertion zone of tibiofibular ligaments and degenerative changes were noted in several articulations namely in vertebrae, foot bones and sternoclavicular articulation. Chronic infection is the most probable etiology to the rib lesions observed.

INTRODUCTION

In this paper we report two cases of osteological remains that presented severe non-specific infectious processes. The two skeletons were recovered in the North of Portugal, in different locations. They will be presented in as two separate case studies.

In both cases the medieval provenance of the osteological remains was inferred on the basis of tomb typology, as well as through the analyses of historical documents (PEREIRA e SOARES, 1997; LOPES *et al.*, 1998a; LOPES *et al.*, 1998b).

The church of S. João Baptista existed, already, during the reign of D. Pedro (14th century). Its construction was consigned to the 12th-13th centuries, or the first half of the 14th century (PEREIRA e SOARES, 1997). In a wider context, this monument is part of the medieval village of Ansiães. At the present time, this medieval small town is the subject of a research project, which aims to comprehend what happened to the peopling of the region, and its subsequent depopulation throughout the 16th and 17th centuries.

CASE STUDY NUMBER ONE

The first case refers to the remains of a male individual (FEREMBACH *et al.*, 1979; STEELE, 1976; SILVA, 1995) who probably died during his fifties (according to Masset's (1982) method, based on cranial suture obliteration). This skeleton was recovered at the church of S. João Baptista at Carrazeda de Ansiães.

The most noteworthy pathological features of the skeleton were the lesions observed on the tibiae, femora and fibulae. These bones present a bilateral surface inflammation of the periosteum, and an expansion of the cortical bone. The inflammatory process manifests itself as fine pitting, longitudinal striation and sequentially, plaque-like new bone formation on the original cortical surface (Fig. 1); no loci of active reaction were found. The lesions are remarkably similar

in all bones. The radiological analysis showed that a considerable cortical thickening and medullar cavity is retained in the mentioned bones (see Fig. 1). Radius and ulna also present an expansion of the cortex.

The lesions on the skull appear to be confined to the face (both zygomatic bones) and forehead. There is some post mortem damage, which complicates the gathering of information. The lesions consist of periosteal bone, which shows only a slight evidence of porosity; these changes are particularly circumscribed to the zygomatic bones.

Other infectious processes were noted in the osteological remains of the individual. Due to the significative oral pathologies surveyed, the oral cavity presents itself as another focus of an infectious phenomenon; severe dental attrition, caries, abscesses and ante mortem tooth loss were recorded. In summary, in both mandible and maxilla, 17 teeth were lost during life; in the remaining 13 teeth, there is one strong carie (with complete destruction of the crown); 3 abscesses were diagnosed; alveolar reabsorption is noticed as well as periodontal disease. Dental wear is severe: in the upper jaw the average is 7.6 (SMITH's scale, 1984) whereas in the lower jaw the average is 5.6.

The mandibular body seems to have suffered a slight thickening of the corpus, whereas in the maxilla the palatal surface presents some bone reaction, that can be describe as an irregular pitting. Because the alveoli present an active bone formation, with a non-complete obstruction of the alveolus, in both maxilla and mandible, the loss of ante mortem teeth occurred near the individual's death. The nasal sinuses also present bone reaction, with distinct new bone formation (Fig. 2).

Degenerative changes, in the cervical and thoracic vertebrae, were also recorded.

In the remaining skeleton, the post mortem damage precludes the observation of other pathological modification, which could contribute to an overall picture of the pattern of lesions of this individual.

DIFFERENTIALDIAGNOSIS

There is a significant inflammatory process that is widespread in all the long bones of the individual. The most probable diagnoses for the lesions observed is periostitis (ORTNER and PUTSCHAR, 1981; ZIMMERMAN and KELLEY, 1982; KROGMAN and ISCAN, 1986; ROTHSCHILD and MARTIN, 1993; AUFDERHEIDE and RODRÍGUEZ-MARTÍN, 1998). This pathological condition can be seen as a manifestation of a generalize disease, by the involvement of the surface of the bones due to a possible osteitis or osteomyelitis, or even as an extension of an adjacent soft tissue infection to the bone (AUFDERHEIDE and RODRÍGUEZ-MARTÍN, 1998). A chronic skin ulcer or a hemorrhage can also be considered (ROBERTS and MANCHESTER, 1995). A traumatic etiology was precluded by X-ray analysis.

Since no cloacae, sequestra or involucra is present, the diagnostic of osteomielitis becomes impossible (ORTNER and PUTSHARD, 1981).

Regarding the dental pathologies surveyed, they can suggest both an abrasive diet, and also that fermentable carbohydrate could be an important component of the diet.

Although there was an absence of a true perforation of the sinuses, a probable etiological condition leading to the maxillary sinuses infection was the dental abscess in the upper jaw.

We can hypothesis that all the affected zones are interrelated, with a primary focus of infection, from which bacteria could have spread, to the all skeleton (ROBERTS and MANCHESTER, 1995). The bacteria could be transported, from a remote spetic focus, by the bloodstream.

The infectious process appears not to be active at the time of death, because no active lesions were found, except the ones related with the ante mortem tooth loss. Therefore it becomes plausible that this individual had suffered from o general process of septicemia, which did not cause his death.

CASE STUDY NUMBER TWO

The second case reports to the skeletal remains of a female (FEREMBACH *et al.*, 1979; KROGMAN e ISCAN, 1986) exhumed from the medieval necropolis of S. Pedro at the site of Castelo de Numão.

The place where the castle is located owns a known past that goes as far as the calcolitic and, beginning of the Bronze Age, fact testified by some archaeological evidences recovered in situ (LOPES *et al.*, 1998a). According to the gathered data, the castle itself is documented since the 10th century.

The chapel of S. Pedro is located outside the castle and has a more recent past. The use of this necropolis is ranged from the 9th to the 14th centuries (LOPES *et al.*, 1998a; LOPES *et al.*, 1, 1998b), but the authors point out the 9th century as the most probable date of emergence of this religious space. In this particular case, historical documents and, mostly, anthropomorphic graves stigmatize the construction date of the chapel (LOPES *et al.*, 1998b).

This woman, who was more than 50 years old when she died (LOVEJOY *et al.*, 1985), shows, in her skeleton, three distinct morphological alterations worthy of note. The lesions recorded consist mainly in an exuberant bone growth.

The first reported lesion is that of an abnormal ossification and calcification of the ribs, seen on the vertebral extremity, with a consequent distortion of their normal anatomy (Fig. 3). This is the most peculiar and remarkable feature found throughout the osteological remains of this individual.

There are three fragments with this distinct lesion; the remaining ribs were shattered post mortem. The exuberant bone growth is almost exclusively confined to the inner parts of the ribs, with an overspread to the external periosteum. There is body expansion in the site where the lesion appears to be very active, that is, on the inner body. The reactive process seems demarcated by a calus osseus, with no periosteum reaction, suggestive of an old fracture. Furthermore, these marks were observed in other fragments of other ribs, and they are interpreted as stab marks; unfortunately the radiological analyses were not conclusive (Fig. 4). The second pathological alteration affects the right tibia, which presents a marginal exuberant exostosis in the insertion of tibiofibular ligaments, and some bone reaction mainly on the posterior and medial side. On this later side we can observe a distinct formation of new bone, completely detached from the periosteum, resulting from a probable subperiosteal hematoma (Fig. 5). No other changes were noted on this tibia. The corresponding fibula only shows a small reaction, without significant bone growth.

Finally, the bone growth in the insertion area of the deltoid, can be described as a new bone plaque formation, totally independent of the cortex of the original bone (this can be observed in the x-ray) (Fig. 6). The periosteum adjacent to this new bone does not reveal bone reaction. The bone plaque formation, itself, shows no signs of infection, it appears completely remodelled, localised on the periphery, which both color and texture do not differ from that of the surrounding bone.

Degenerative changes in several articulations namely in vertebrae, foot bones and sternoclavicular articulation, were also recorded.

DIFFERENTIALDIAGNOSIS

As probable causes for the lesions reported above we advance the following hypotheses, all of them pointing out traumatic episodes.

Taking into account the morphological reaction of the bones (new bone formation), the traumatic events must have occurred a long time before the death of the individual (AUFDERHEIDE and RODRÍGUEZ-MARTÍN, 1998).

Regarding the rib changes observed, two etiological factors are possible: on one hand, the chronic infectious process could be an extension of an infection located on the adjacent soft

tissues, resulting from an eventual pulmonary disease. On the other hand, the evidence of stab marks, allow a different extrapolation, that the cuts were particularly severe, provoking an infectious reaction, i.e., the development of the infection would be post traumatic (ORTNER and PUTSCHAR, 1981; ZIMMERMAN and KELLEY, 1982; KROGMAN and ISCAN, 1986; ROTHSCHILD and MARTIN, 1993; AUFDERHEIDE and RODRÍGUEZ-MARTÍN, 1998). In this case, it becomes difficult to know whether the infectious source was internal or external.

The probable cause of the observed lesions in the tibiofibular ligaments' insertions could be a sprain. A traumatic episode such as this can account for this exuberant marginal ossification (PÁLFI, 1997).

In what bone growth in the right humerus is concerned, a probable cause for this would be a blunt trauma. It frequently generates a subperioosteal hematoma that subsequently can be ossified by the overlying periosteum (AUFDERHEIDE and RODRÍGUEZ-MARTÍN, 1998). This sort of lesion is differentiated from reactive change to treponemal infection by their very sharply localized periphery, which is observed in this case.

The poor state of preservation allied with the incompleteness of the skeleton does not allow us to have a whole perspective of the bone lesions. As a result the evaluation of the probable relation between them is not possible.

In conclusion, we deal with two particular infectious cases, with different etiologies, which witness the existence of chronic infectious diseases during the medieval times.

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FIGURES

Pósters

Severe non-specific infectious processes from Late Medieval Period (Portugal)



Fig. 1a



Fig. 1b



Fig. 2



Fig. 3a

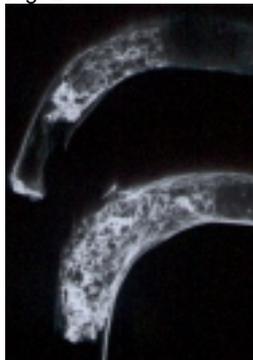


Fig. 3b



Fig. 4a

Pósters

Severe non-specific infectious processes from Late Medieval Period (Portugal)

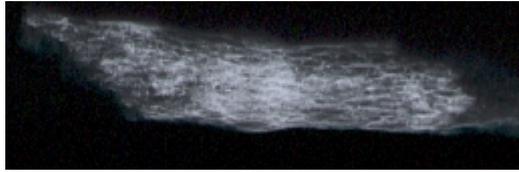


Fig. 4b



Fig. 5a



Fig. 5b



Fig. 6a



Fig. 6b

Figure 1. Periostitis indicated by the new bone formation. The X-ray clearly shows a cortex thickening and the retention of the medullar cavity.

Figure 2. New bone formation on the floor of the maxillary sinuses.

Figure 3. Abnormal bone growth on the ribs. The right illustration shows the pattern of ossification.

Figure 4. Rib fragment with calos formation.

Figure 5. Exostosis on the right tibia: lateral and anterior view.

Figure 6. Humerus fragment with bone growth (correspondent X-ray, lateral view).

