DIFFERENTIAL DIAGNOSTICS OF TWO CASES OF ANKYLOSED WRISTS FROM THE EARLY MIDDLE AGES IN SLOVAKIA

ABSTRACT — The first case is concerned with the skeletal remains of a 40—60 years old male from grave No. 709 in Čakovce, Nitra District, (10th century A.D.). The pathologically changed right wrist consisting of fused carpals and metacarpals and of isolated corresponding forearm bones is a remarkable find. It is characterized by an extensive carpometacarpal ankylosis showing minimal productive changes, carpal sequestration and possible osteoporosis. Small osteophytes can be seen on the radiale-ulnare articulation. There is a sinus drained through an orifice on the articulation surface of the distal radius. This part shows marks of discrete periosteal reaction.

The rest of the skeleton does not offer any valuable diagnostic information, and as to pathologival changes only a degenerative spondylitis can be identified. However, the inflammation process on the wrist is diagnostically not unusual and possible tuberculous etiology can be presumed.

The second find of ankylosed wrist and forearm of an adult male from grave No. 39 in Medzdraž, Komárno District, (10th—11th centuries A.D.) is marked in a similar way by extensive symptoms with small productive changes, but the presence of an unambiguous traumatic injury in the carpometacarpal region points to a diagnosis of posttraumatic arthritis.

The morphological and radiological similarities between both pathological processes make a correct diagnosis difficult. A definite solution of the problem requires further study as well as comparison with analogous findings.

KEY WORDS: Palaeopathology — Skeletal remains — Macroscopic and radiographic data — Central Europe

INTRODUCTION

The etiology of ankylosed wrists presents a complex differential-diagnostic problem, both for medicine in general, and for palaeopathology in particular. While in human medicine further orientating is facilitated by the overall clinical picture, a radiograph — the main means of the palaeopathological diagnostics — is non-specific to a great extent and has common features for several diseases.

The differential diagnostics include pathological conditions of various etiologies: traumatic lesions, non-specified arthropathies and related atypical forms, specific processes and tumours.

Up to now, the Czechoslovak specialized literature has published only a single case of ankylosed wrist of tuberculous origin (Šíloukala 1964). Finds affected with bone tuberculosis are rare in palaeopathology. A survey of pathological finds in the territory of Czechoslovakia up to 1979 (Havlíková and Vyhnané 1981) mentions only 11 cases. In addition, Šíloukala and Vyhnané (1976) announced a further (unpublished) case of an ankyloitic wrist excavated in the Mikulice site (the fifth cemetery).

At the Days of Osteological Anthropology
There are numerous small orifices reaching to a maximum diameter of 1.35 mm on the preserved bone and indicating the process of reactive hypervascularization. The productive changes are documented by discrete bone appositions (in places of the course of intercortical ligaments) and by tearing of bone remodeling, which are evident mostly on the dorsal side.

Due to extensive postmortem damage a considerable high degree of the cancellous tissue is visible (Fig. 3b). The diagnostic value of the spongiosisporos, and of the presence of cystic and/or pseudocystic changes, cannot be determined in view of the degree of bone damage. Macroscopically and radiographically one can see a large number of small cavities of a diameter of 2–3 mm in the absence of circumscribed bone or sharply defined boundary refutes their cystic character.

A shifting of the articulation surface for the first metacarpal in palmar direction does not exclude the possibility of retraction of the thumb.

Radius

Only part of the distal articulation surface has been preserved (Fig. 3). There are several orifices and stumps leading into the medullary cavity, while the more continuous layer of the compact bone in one of the openings (indicated by the arrow) arises our suspicion that there was a penetrating inflammatory process. The damaged structure of the cancellous tissue in the other openings clearly indicates their secondary origin. In the proximal part of the stylet process there are well recognizable minor exostoses. More obvious exostoses have been formed in the incisura ulnaris.

The distal third of the right radius is slightly thicker, in all possibility due to periosteal apposition. With regards to the contralateral side, the cross-section of the distal metaphysis is extended by 3 mm (measured on a radiograph). An increased concentration of small openings on the surface of this part documents the accentuated vascularization of the periosteum. On the radiograph this changes appear as increased density of the osseous tissue (Fig. 2).

The entire right diaphysis is at least ca. 1 cm (about 5 mm) shorter in comparison with the contralateral bone. The flatter bicipital tuberosity suggests that the right forearm was less actively used.

Ulna

The styloid process and the articular circumferential of the right ulna have been pathologically changed, they bear marginal oseophytes. There are no particular features on the diaphysis, the proximal epiphysis is missing. In spite of the left ulna being more robust than the one of the right, both ulnae have the same length and shape.

DISCUSSION

The most characteristic feature of the Čakajovec find is the fusion of the carpal and of the firmly

FIGURE 1. Synotmetrical right wrist and isolated correspondence fragments of an individual found in grave No. 709 at Čakajovec, a — dorsal view, b — palmar view. Photograph by M. Corneliussen.
arthritide and similar atypical forms, as well as degenerative diseases of the joints might be taken into consideration. Nevertheless, the two latter nosological units can be excluded. In spite of the above-mentioned degenerative changes on the third metacarpal epiphysis and possible degenerative changes of the radial column, the given ankylosing process has a definite inflammatory character. Moreover, the presence of both the sequestration and sinuses does not fit into the picture of either the rheumatoid arthritis or a degenerative joint disease.

Differentiation between a specific and a non-specific inflammation constitutes a complicated problem. Both processes are characterized by osteoporosis and by varying degree of reactive periostosis with productive appositions, sequestration, deformation and/or disappearance of the articulation surfaces of individual bones, and gradual ossification of the trabeculae between the bones resulting in final ankylosis. This is especially characteristic of the chronic processes (Blázek 1980, Ortner and Putzchar 1981, Kohl and Zílovský 1987).

In case of the ankylosed wrist from Modryany, the firm point for the diagnosis has been the univocal traumas of the third metacarpal affecting also the proximal epiphysis of the second one. Moreover, one can observe several suspect characters of further traumas of the wrist, including a possible palmar dislocation of the proximal set of carpal (Fig. 4).

The hypothesis of traumatic origin of this ankylosis is supported also by some indirect features — limited furrows on the dorsal surface of the wrist as possible traces of penetrating injuries, flexed position of the metacarpals as a probable result of disturbance of the integrity and function of extensors. The productive changes were explained as gradual ossification of both the proliferated granulation and the hypervascularized periostium.

The specimen from Modryany lacked the characters of typical osteomyelitic process — such as massive sequestration, alternating zones of resorption, sclerosis and proliferation of bone tissue. An important symptom was also the absence of conspicuous periosteal proliferation, regarded by many authors as characters of osteomyelitis (Hoppe and Polívka 1968, Kriem and Edelen 1973, Ortner and Putzchar 1981, Kohl and Zílovský, 1987).

The absence of both the spongiosesclerosis and the more acute periosteal reaction, which are very typical of a chronic form of a non-specific arthritis.
a specific process in the wrist can be increased by the presence of affections of further skeletal parts, namely those of axial ones.

CONCLUSION

We are well aware of the fact that both the specific and non-specific affections of the wrist produce similar or almost identical morphological and radiographic picture. Although the ankylosed wrist from Čakovce has more characters in favour of tuberculous etiology — and we are inclined to accept this diagnosis —, a possibility of infectious or posttraumatic arthritis cannot be excluded with full certainty.

This study should not be understood as the definite solution of the investigated problem. The ankylosis finds from Morany and Čakovce should be subjected to further study as well as comparison with other finds of analogous character. One also may hope that the suggested diagnostic criteria of the specific process will release more profound discussion.

REFERENCES