October 1st and 2nd, 1976

PAPERS ON PALEOPATHOLOGY

presented at the

First European Members Meeting

of the

Paleopathology Association

Ciba Foundation
London, England

POROTIC HYPEROSTOSIS AND THE PROBLEM OF THE ORIGIN OF THALASSEMIA IN ITALY

A. Ascenzi and P. Balistreri

There is much speculation concerning the origin of thalassemia in Italy. Two theories have been put forward. According to the first, thalassemia was carried to this country by Greek colonizers. This view is essentially supported by the observation that thalassemia is common in areas which had broad and prolonged contacts with the Greeks of the sixth and seventh centuries B.C., i.e. Sicily, Calabria, Sardinia, Lucania, Puglia and the Po Delta. According to the second theory, the origin of thalassemia goes back to the Upper Paleolithic era.

Recently, we had the opportunity to examine the skeletal remains belonging to 227 individuals discovered during a series of archaeological excavations in Lucania, an area where the penetration of Greek colonizers has been thoroughly investigated. Some cases of porotic hyperostosis found in these remains have given us the opportunity to discuss the meaning of this pathological entity and to make an inventory of osteological documents concerning the question of the origin of thalassemia in Italy.

The conclusion drawn is that the skeletal remains showing porotic hyperostosis found so far in Italy are unable to provide a solution to the problem of the origins of thalassemia in this country. To make investigations more rewarding in future, the following main methodological principles are recommended. (1) If possible, research should be restricted to cases where porotic hyperostosis occurs in more than one individual and where archaeological and anthropological findings point to the existence of family ties between the individuals investigated. (2) Special attention should be devoted to collecting pathologic bone material belonging to children. (3) Skeletal remains belonging to each individual should be complete, so as to allow the investigator the greatest possible range of pathological information.

SAND PNEUMOCONIOSIS IN AN EGYPTIAN MUMMY

E. Tapp, A. Curry and C. Anfield

The lungs of a twelfth dynasty mummy which had been preserved in a canopic jar contained areas of fibrosis. Adhesions between the pleura

and pericardium had resulted in part of the heart wall being included in the jar.

Within the fibrous areas and around blood vessels in more normal parts of the lung, there were many small birefringent particles. An analysis of these particles with a Kevex Si (Li) detector attached to an AEI Corinth 275 electron microscope showed that they contain silica and iron. It is assumed that they are fine particles of stone or sand and that the lungs had been removed from a person suffering from sand pneumoconiosis.

ARCHAEOLOGICAL PROBLEMS AND PALAEOPATHOLOGY IN AN ANGLO-SAXON CEMETERY

A. Calder

An Anglo-Saxon cemetery at Updown in Kent, located by aerial reconnaissance in 1973, was partially threatened this year by the laying of a water main. A rescue excavation of 36 graves threatened by the development was undertaken.

The Updown cemetery is a prominent chalk hill with a shallow covering of topsoil. The graves were orientated on an east-west axis, and were well dug into the chalk substrata. The stratigraphy of each burial was relatively uncomplicated, but several were disturbed by tree roots and rodent burrows. These factors, together with the permeable nature of the chalk, ensured that the skeletal remains, which survived 1300 years of inhumation, were very fragmentary and often grossly distorted. This lack of bone material in many graves enforced a heavy weighting on artefactual evidence for the reconstruction of a population profile.

The sample included 16 males, 13 females and 7 of unknown sex. All age groups from infancy to post 45 years were represented and stature estimates were comparable to those from other nearby Anglo-Saxon populations. A limited amount of pathology was detected, notably dental attrition and hypoplasia, and several individuals exhibited vertebral osteoarthrosis. A talocalcaneal bridge and spinal wedging were also recorded.

The problems encountered in the Updown excavation highlighted the need for improved communications between archaeologists and palaeopathologists.

PALAEOHELMINTHOLOGY - A CURRENT APPRAISAL

P. S. Gooch

The finds of helminth material in historic and prehistoric material have so far been mainly derived from three sources, coprolites from the pre-Columbian cultures of the American West and Southwest, cess pit and midden material from Northwest Europe, and Egyptian mummies deposited in various museums. The difficulties of analysis and interpretation associated with these different sources of material are discussed. Evidence suggests that Trichuris, Ascaris and Enterobius have been cosmopolitan parasites of man from the earliest times and that both Egyptians and Chinese have suffered from schistosomiasis for the last 2000 years. Paragonamiasis seems to have existed in pre-Columbian America. Nematodes such as Strongylus edentatus, found preserved in the tissues of frozen Siberian mammals from glacial times, are morphologically identical to modern specimens. A bibliography of some 50 references is available.

A PROBABLE CASE OF OSTEOMA OF THE LABYRINTHUS ETHMOIDALIS IN A MEDIEVAL SKULL

R. Perrot

A medieval (Carolingian) skull from Boyer (Tournus, Saône-et-Loire, France), reduced to fragments that have now been reconstituted, is that of an alpinoid male adult, 45-50 years old. There is no important dental pathology of the maxilla. In the incisura nasalis, there is a growth (21 x 20 x 11 mm), which is an anomalous deformation of the labyrinthus ethmoidalis. The bone seems to be inflated and is limited by a smooth exterior. Appearance and location suggest the diagnosis of a benign tumour like osteoma.

The categories of osteoma classically described are: (1) spongy osteoma (spongy osseous tissue) and (2) ivory osteoma (dense osseous tissues). The second category may be confused with osteocartilaginous exostosis. This case seems to be a spongy osteoma, though ivory osteoma is the most common find in human paleopathology. Hooton (1930) gives a frequency of 2.24% for 'button osteomata' in early Pecos Pueblo Indians. D. Brothwell (1961) notes seventeen cases in earlier neolithic British populations. P. Morel (1961) described an important case of osteoma of the frontal and ethmoidal bones from medieval France.

A PREHISTORIC (COPPER AGE) CASE OF OSTEOCHONDRITIS DISSECANS TALI

R. Perrot

In a left adult talus (exact age and sex unknown) from Le Rond-du-Lévrier (near Le Monastier-sur-Gazeille, Haute-Loire, France), the bone shows three anomalies, the third being the most important: (1) in the middle of the edge of the facies malleolaris medialis there is a little notch of unknown etiology; (2) the median forepart of the trochlea tali goes through with a supernumerary facet under the collum tali: this is classically considered as a character of frequent squatting; (3) half of the trochlea tali and the facies malleolaris lateralis is much eroded.

Location and appearance suggest osteochondritis dissecans. This pathology is a non-infectious osteonecrosis affecting a small part of epiphyis, with formation of loose osteocartilaginous bodies. This condition is common in the knee and elbow, but in modern pathology it is unusual in the ankle-joint: when it occurs, we have the following frequencies: right talus (55%) - facies malleolaris medialis (59%) - young male adult (58%). Except for certain spontaneous cases the most common etiology is traumatic (a flake fracture). In this case, the osteochondritis dissecans seems to be caused by an external sprain: the talus hit against the malleolus lateralis fibulae without breaking the bone and with only ligamentous damage. This is the first recorded case in paleopathology.

TISSUE RECOGNITION MARKERS IN PALAEOPATHOLOGY

A. T. Sandison

Recent studies in the palaeopathology of Egyptian mummies initiated by Cockburn and his group in Detroit and elsewhere have given a new impetus to palaeohistopathology. While there are inbuilt obstacles to such investigations in the form of scarcity of material, it is likely that the interesting findings of this group will stimulate further studies in other centres. I have always advocated caution in the interpretation of histological sections from mummies and other dried bodies and ideally these should be read only by trained histopathologists. This, however, is a policy of perfection, and others are likely to be tempted to try their hands at this fascinating game.

I have outlined some of the artefacts seen in tissue sections which may puzzle the beginner, and have indicated that special staining techniques in light microscopy which outline collagen, muscle, elastic tissue, mucopolysaccharides, pigments and epithelial cell walls may greatly facilitate

recognition of tissues in mummies and dried bodies. There is little doubt that applications of transmission and scanning electron microscopy will be of great value also. I look forward to the immunohistological identification of tissue components, but so far this remains in the future.

PALEOPATHOLOGY IN THE SKELETAL REMAINS OF THE PEOPLE OF CASAS GRANDES, CHIHUAHUA (MEXICO)

M. Schultz

Casas Grandes is situated in the northwestern area of Chihuahua in the great central plateau on the east side of the Sierra Madre Occidental. In this area, a population called Chichimecan was living about 700 A.D. and came into contact with the Toltecs around 1060 A.D. (Di Peso 1968).

The skeletal remains discussed (441 individuals) belong to the Paquimé and Diablo Subperiod (A.D. 1205-1340). The mortality has been rather high in the early years (0-5 years 27.7%, 6-12 y. 3.2%, 13-17 y. 5.2%) and in young adults (18-35 y. 29.7%, 36-50y. 15.6%, 50+ y. 3.2%: age average of the adults about 33 y. ≙ 214 individuals). Arthritis was found in 15.7% (male 6.3%, female 9.4%) of young adults (18-35 y.), in 43.5% (m. 24.6%, f. 17.4%, unknown 1.5%) of older adults, and in 64.3% (m. 35.7%, f. 28.6%) of people over 50. Congenital fusion of two vertebrae was found in 2.5%, collapse of a vertebra 0.6%, spina bifida 0.3%, malnutrition (rickets) 0.6%, porotic hyperostosis 0.95%, tumor (ossified fibroma 0.3%, odontoma 0.6%, osteoma eburneum 0.3%, fracture 0.3%, and traumata 3.2% (about 1% fatal), in the population as a whole.

Buttler (1971) gives some data on the analysis of the teeth. Out of 4477 teeth of the Medio Period, 5.2% showed signs of caries (8.6% in the Viejo Period A.D. 750-1060). The highest caries frequency was in the third molar, with 11.7% (I_1 0%, I_2 0.2%, C 1.2%, P_3 1.9%, P_4 4.4%, M_1 8.4%, M_2 10.9%).

MAIZE, MALARIA, AND THE ANEMIAS IN THE PRE-COLUMBIAN NEW WORLD

M. Y. El-Najjar

Porotic hyperostosis, a descriptive term for abnormal bony changes in the skull appearing as spongy or sieve-like porosity in the cranial bones and/or

orbits, was studied in 3361 prehistoric and historic human crania. The skeletal samples represent seven distinct geographic localities that fall into two major subsistence patterns: maize dependent and non-maize dependent. Porotic hyperostosis was found to be significantly higher among children and adults in the maize dependent groups than in the non-maize dependent ones. Common causes of this pathology in the Old World, e.g. malaria, sickle cells, thalassemia and G6PD deficiency, were not present in the New World prior to European contact. Abnormal hemoglobins and G6PD deficiency found in modern day American Indians is attributed to European and African admixture. In areas of the New World where the inhabitants were heavily dependent on a maize diet, significantly more people suffered from iron and protein deficiences and had a higher incidence of porotic hyperososis. It is hypothesized that nutritional properties and processing techniques of maize were the principal factors responsible for porotic hyperostosis in the New World.

DISEASES OF THE MAXILLARY ANTRUM

C. Wells

After brief references to traumatic lesions, simple osteomata and malignant neoplasms, the subject of sinusitis was considered in depth. Slides were shown to illustrate primary sinusitis resulting from nasal and para-nasal infections, and secondary sinusitis consequent on the upward spread of dental or alveolar abscesses. The occurrence of fistulae was noted, together with the development of large bony masses around them. The difficulty of diagnosing sinusitis in intact skulls was stressed and the relative uselessness of radiographs was emphasized. In an attempt to estimate its frequency in early populations, the antra of 387 skulls were examined through a Watanabe arthroscope. The technique of doing this was described and details given about photographing the antral cavity with the special Shinko Koki Pen-F 35 mm camera designed to be attached to the telescope.

The material used for this study ranged from Bronze Age to medieval times, and significant differences were found in the incidence of sinusitis in different epochs. It was not detected in some small Bronze Age and Iron Age series. In Romano-British groups, its frequency was 2.8%; in the medieval period it was 3.6%; 6.8% of Anglo-Saxon skulls were affected.

The probable reasons for these variations were discussed with reference to climate, changing house patterns, occupational differences, racial and anatomical characteristics, etc.

NEW POSSIBILITIES IN THE DIAGNOSIS OF BONE DISEASES

M. Schultz

Histological analysis of prehistoric bones by polarized light is a very important aid in studying the nature of an ancient disease. The material is usually very fragile, and as a result thin sections are difficult to obtain. Therefore the bone must first be prepared in a histological laboratory. There are two possibilities: to cut thin sections with a special microtome, e.g. Jung Model K (Stout and Teitelbaum 1976) and the well-known grinding process. I prefer the second method for very fragile and thick material (e.g. femur). By using this technique, it is possible to avoid multiple microfractures which might interfere with the histological results. In addition, the size of the samples, at least in cross-sections of human bones, is unlimited. The bone has to be embedded in methylmethacrylat and ground down to a thickness of 30-25u. If caution is used the bone will not be distorted by the grinding process. Using polarized light, we can detect abnormal structures which may have been caused, for example, by metabolic disorders. This technique enables us to check on the viability of a Haversian system at the death of an individual. Such viability might be falsely suggested by normal light microscopy. Lamellar, woven bone and the borders of osteoid structures can also be differentiated.

THE PRESENCE OF THALASSEMIA IN EGYPTIAN MUMMIES

E. R. Massa

Well preserved red cells in Egyptian mummies are reported in these preliminary notes. The examination of surface tissues from some specimens shows the presence of the kind of red cells which are characteristic of thalassemia. Some red cells, found in lacunae which can be interpreted as venous vessels, show a typical shape due to abnormality in the haemoglobin; 'target cells' were also found. Specific stainings, such as the Dominici and Pickworth, were carried out; the positive results obtained with these benzidine stains demonstrate the heme-group. The diagnosis of thalassemia in ancient Egyptian mummies was confirmed by the presence of some skeletal malformations.