ANTHROPOLOGIE * XXV/1 * 1987

V. J. DERUMS

PALEOPATHOLOGY OF BRONZE AGE POPULATION IN LATVIA

ABSTRACT — The bones of 230 Bronze age skeletal remains excavated by the archaeologist J. J. Grandonis in 1967 at Kivutkalus on the island of Doles near Riga have been studied.

KEY WORDS: Paleopathology — Bronze Age — Latvia — Kivutkalus.

Our material demonstrates resistence of the bone system of Bronze Age man in Latvia. Data on dystrophic lesions of joints and of vertebra (deforming arthrosis and spondyloses) are presented. Extasia of the middle concha bone (Concha bullosa) has been found of which no mention has been actually made in paleopathology. Lack of dental care led to pyo-inflammatory alveolar diseases. Due to strong limb bones macro- and microstructure bone fractures were rare. Incomplete but healed therapeutic cranial trepanation has been found.

INTRODUCTION

Dynamics of skeletal bone alterations in the prehistoric man was closely connected with physical load and severe living conditions. In the struggle for existence the best physically fit and strong individuals survived. Infantile mortality (under 9 years) reached 30 per cent, average life-span was 30 years.

Hard everyday living conditions influenced the bone system to develop strong external relief and internal macro- and microstructure (L. Vyhnánek, M. Stloukal, 1968, V. J. Derums, G. I. Demidov, 1976).

Our previous paleopathological studies of bone substance (1978, 1979 and 1980) point to a certain deterioration of macro- and microstructure and biomechanical properties of limb bones in the twentieth century people.

Stronger circular ligament (Ligamentum teres) of the bone in the Bronze Age people is of interest too. It is fed by a small branch of Arteria obturatoria and thus maintains blood supply of Fossa acetabuli (W. H. Hollinshead, 1974).

In our opinion this strengthened the hip joint which is critical for jumping and running, necessary for hunting wild animals.

Severe life, struggle against wild nature and hostile tribes kept prehistoric man alert and tense. Therefore these hunters had sharp sight and hearing (V. J. Derums, 1964). The same conditions persisting for centuries promoted the development of conditioned motor-defense reflexes. A certain role in their development was played by signals from receptive areas of limb bones arising in resting or movement. The function of these receptors via the central nervous system has been reported by E. Sh. Airepetyan, A. S. Batuev (1969), G. A. Yankovsky (1982).

MATERIALS AND METHODS

The bones of 230 skeletons excavated by the archeologist J. J. Graudonis in 1967 at Kivutkalns on the island of Doles near Riga have been investigated. The bones were examined by means of visual pathoanatomical analysis, roentgenography, stereoscopic microscope MBC-2 with 12-fold magnification or a greater one. Thin sections of substantia compacta of femoral and humeral bones have been examined microscopically as well (V. J. Derums, 1978, 1981, 1982).

The studied skeletal finds are deposited at the Latvian SSR Academy of Sciences Institute of History

RESULTS

Deforming arthroses and spondyloses

Deforming arthroses are among the earliest diseases of the animal world (R. Virchow, 1895).

In ancient Latvia cases of deforming arthrosis have been identified in the bones of the Late Mesolithic being dated 7 000 years back (V. J. Derums, 1978).

Evidence of deforming spondylosis has been found in Azerbaijan in the skeleton of a Quaternary wolf that lived over a million years ago (G. V. Gadjiev, D. V. Gadjiev, 1954).

Important cases of deforming spondylosis in vertebral bones of prehistoric man were described by D. G. Rokhlin (1965) and foreign authors: M. A. Ruffer, 1918/1919, H. Hanáková, L. Vyhnánek, 1981, etc.

In our study we found 9,1% cases of deforming arthrosis (mostly of degree II—III) and 19,1% of deforming spondylosis, osteochondroses included, in the skeletal material of the Latvian Bronze Age people (*Figs. 1—5*). The age of those affected was 20—33 years. To a certain extent this suggests premature ageing and wear of osteoarticular system in the prehistoric man.

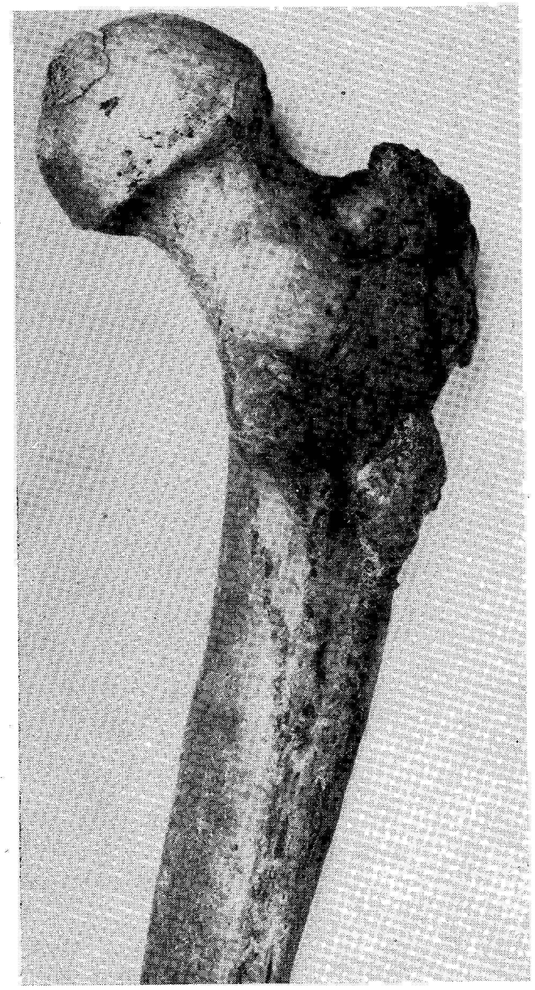

FIGURE 1. *The right femoral bone with strong muscular relief. Flat exostosis is seen at the place of the third trochanter, and deforming arthrosis of the femoral head margin (Femur dextrum cum trochanetris tertii et majoris exostosi). Burial No. 38. Adul. man.*

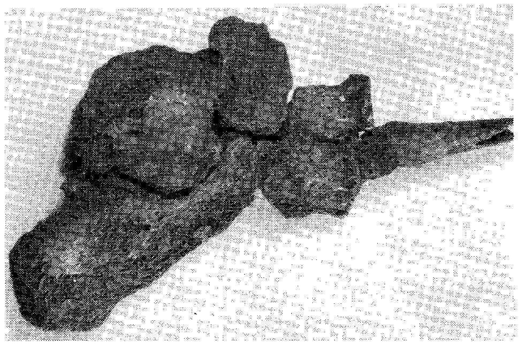

FIGURE 2. *Deforming arthrosis of foot bones (Arthrosis deformans ossium tarsi). Burial No. 230. Male, age 40.*

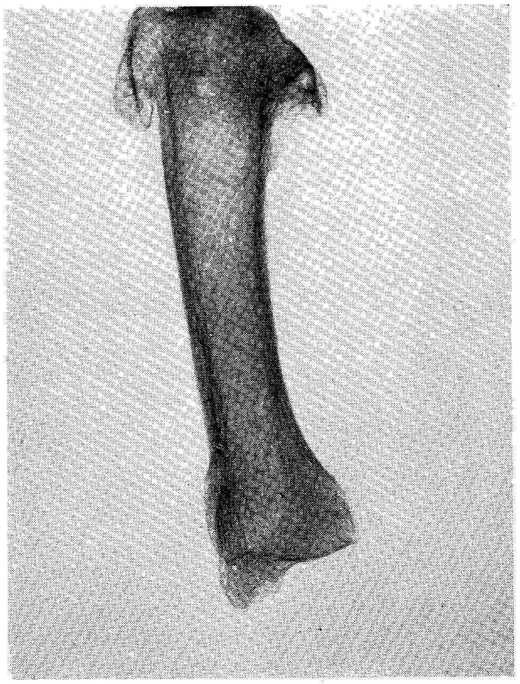

FIGURE 3. *Roentgenogram. Deforming arthrosis of hand bone head (Arthrosis deformans capitis ossis metacarpalis). Burial No. 230.*

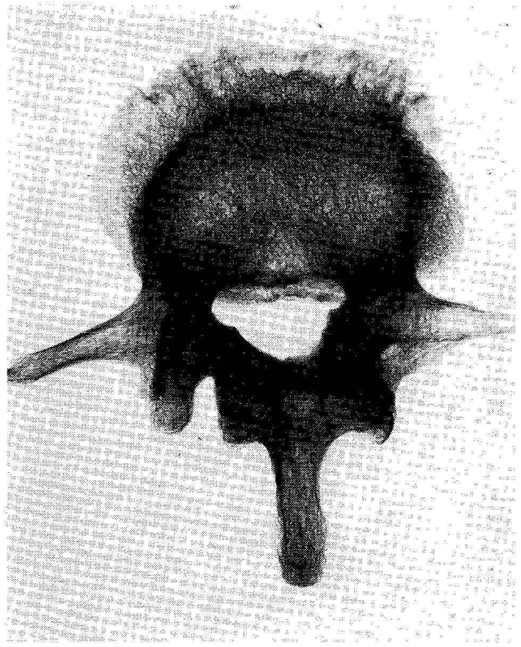

FIGURE 4. *Roentgenogram. Deforming spondylosis of the 3rd degree of the 12th thoracic vertebra (spondylosis deformans gravis vertebrae thoracalis XII). Burial No. 143.*

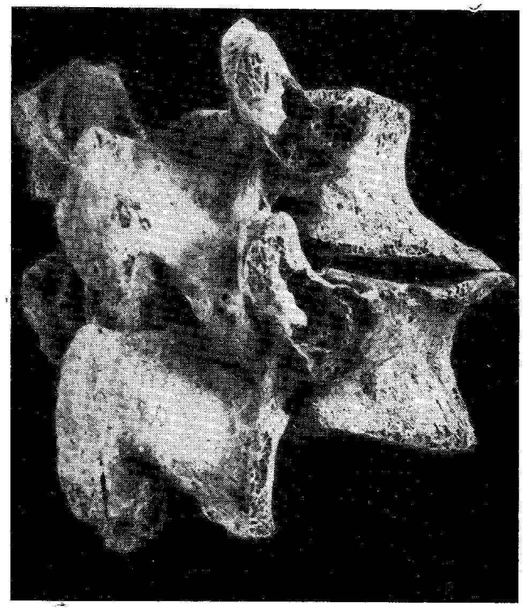

FIGURE 5. *Osteochondrosis of two lumbar vertebrae (Osteochondrosis vertebrarum lumbalium). Burial No. 20 Male of strong build.*

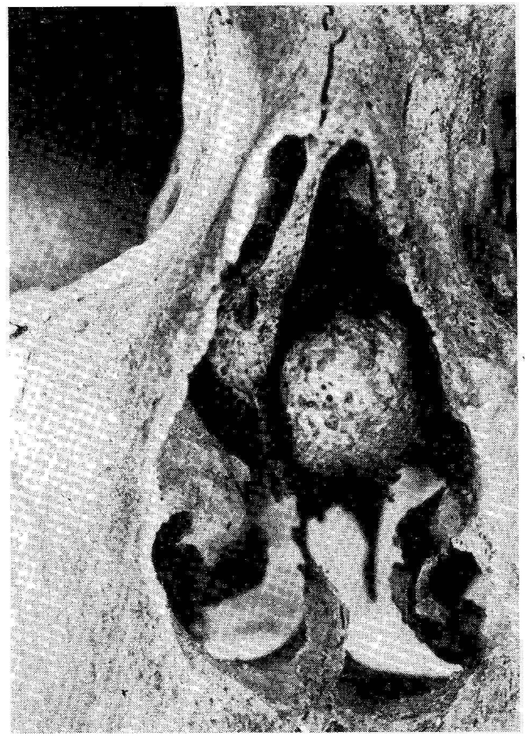

FIGURE 6. *Pemphigoid extasia of the middle turbinated bone (Concha bullosa). Burial No. 78. Adult female.*

We have identified 10 cases of pemphigoid extasis of the middle turbinated bone (Concha bullosa). (*Fig. 6*). This rare disease might be due to unfavourable climate with high humidity (living and fishing on an island of a great river).

Pyo-inflammatory maxillary diseases

This chronic form of odontogenic osteomyelitis in the jaws of the prehistoric man was described on the basis of the find from burial grounds dated 3 000—2 000 B. C. (H. Sigerist, 1951).

Our skeletal material from the excavations in Zvejnieki presents a nice example of odontogenic osteomyelitis with a fistulous passage in the upper jaw of a man of the Late Mesolithic period (V. J. Derums, 1978).

In the skeletal material of the Latvian Bronze Age we recognized 10 cases of chronic odontogenic osteomyelitis with fistulous passages, sometimes even on both sides of the jaw (*Figs. 7—8*). In 50 jaws of the Bronze Age people 31,3 cases of dental caries were found (P. J. Denisova, 1972). The absence of dental care led to severe odontogenic osteomyelitis.

Bone fractures

There is extensive literature on bone fractures in prehistoric man. Most authors note that such fractures healed relatively well (D. G. Rokhlin, 1965,

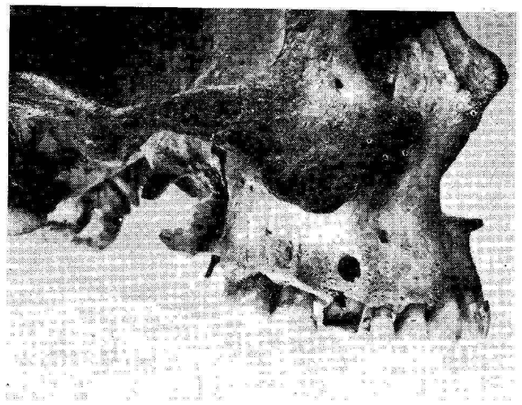

FIGURE 7. *Abscess opening, destruction at the root of the 2nd premolar (Status post abscessum radicis dentis praemolaris II cum fistula). Burial No. 93. Adult male.*

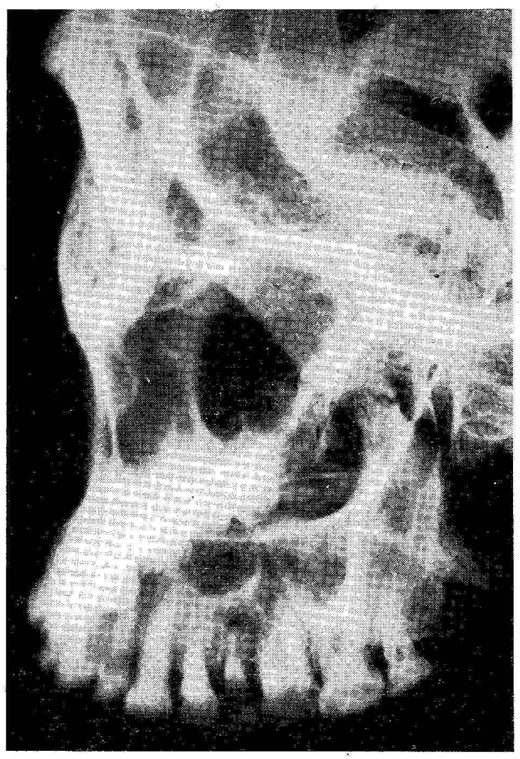

FIGURE 8. *Roentgenogram of the same jaw, granulom at the 2nd premolar and encapsulated cystic formation above it. Burial No. 93.*

H. Hanáková, L. Vyhnánek, 1981, V. J. Derums, 1978, L. N. Kazej, 1975).

In the Latvian Bronze Age material ve found two fractures of the distal ulna with slight angular displacements. Both fractures healed well (*Fig. 9*).

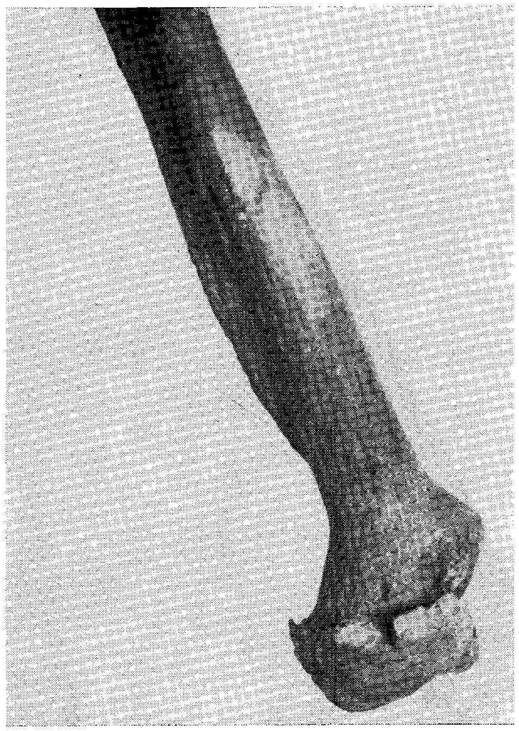

FIGURE 9. *Fracture of the distal part of ulna with slight angular displacement (Status post fracturam distalem ulnae cum dislocatione ad axem). Burial No. 38. Adult male of strong build.*

Cranial trepanations

There are data on successful cranial trepanations in the late Stone Age (D. G. Rokhlin, 1965). In the eneolith in Czechoslovakia trepanation with signs of regeneration was found (J. Jelínek, 1960). In 1968 the same author reported trepanations with obvious regeneration in the early Bronze Age. Successful cranial trepanation was completed in Georgia in the Bronze Age (P. M. Pirpilashvili, 1974).

In Latvia we identified 10 cranial trepanations dated from the Stone Age to the 17th century A. D. 8 of them had evidence of regeneration.

Incomplete but subsequently healed therapeutic trepanation was performed on the skull of a physically strong man in the Bronze Age (*Fig. 10*). On the right side of the forehead there is a round damage 9 mm in diameter and 3,4 mm deep. On the sloping edges of the defect there is a star-shaped healing. The operation was performed in two stages. After scarifying the operator went deeper using a sharper instrument to make an oblong 2,5 × 4 mm opening. There is jugular foramen stenosis on the right side of the skull base. Such a case of jugular foramen stenosis is reported also in Hungary by Regoly-Mérei (1967) in Avars of the 8th century A.D.

It can cause increased intracranial pressure because it hinders circulation in the jugular vein.

FIGURE 10. Incomplete but healed trepanation in the right frontal area of the skull (Trepanatio cranii). Burial No. 20. Male of strong build.

Headaches and convulsions might result. The latter might have necessitated trepanation. It is possible that during the operation the patient's condition grew worse and the work was interrupted. Healed edges and closed diploe show that the man survived for a year or longer.

CONCLUSION

Good physical development of the bone system in the Bronze Age population in Latvia have been proved. Deforming arthroses have been identified in 9,1 % cases and deforming spondyloses — in 19,1 % cases. Ten cases have been found of extasia of the middle turbinated bone (Concha bullosa) of which no mention has been actually made in paleopathology. Ten cases of pyo-inflammatory maxillary diseases have been identified in the form of odontogenic osteomyelitic consequences. As a result of well developed macro- and microstructure of limb bones only two fractures of the lower ulna with slight angular displacements have been found, well healed. Incomplete but healed therapeutic cranial trepanation has been identified.

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Dr. V. Derums
Latvian Research Institute
of the clinical and experimental
medicine of the Ministry of
Public Health
4 Ojara Vaciesa Street
Riga 226004 U.S.S.R.