Studies in Historical Anthropology, vol. 4:2004[2006], pp. 207–212

The unique find of male skeleton from Kalisz-Zawodzie with multiple pathological changes

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In the year 1988, during the excavations at Kalisz-Zawodzie site, directed by Dr. T. Baranowski from Institute of the History of Material Culture, Polish Academy of Sciences, Warsaw, there have been found an unique skeleton. This find, characterised by peculiar anatomic pathological changes was unearthed as grave number 4/88 and was dated by Dr. Baranowski as 13th c. burial (1250–1300 AD). The grave was located in the corner of basement of the east wall of St. Paul collegiate church and its apse (**Fig. 1**).

Skeleton was buried in rectangular coffin in supine position oriented NE–SW with the skull pointing SW. According to Dr. Baranowski, skeleton was positioned with its skull laying on the left side facing NW with the extremities straighten out and feet turned outside. Skeleton is near complete with only some ribs and the coccyx missing (**Fig. 2**).

I had conducted anthropological analysis, describing individual as a male, aged about 35–40 years old ("early maturus"). I have also described some pathological changes that I've observed on the remains. As verified diagnosis was of great importance in this case, I have asked for independent diagnosis Prof. Dr. D. Tylman from Central Clinical Hospital of the Military Medical Academy, Warsaw, and Prof. Dr. W. Scheffrahn from University of Zurich. Their opinions and diagnoses mostly confirmed my description.[1]

The whole picture of pathological changes of definitely congenital character was complicated. The individual was suffering from rib hump with pronounced right-sided scoliosis with vertebral rotation and wedge deformity of the vertebral bodies. The vertebrae longitudinal axis was bend and buckled in all three body planes with additional flattening and rotation. In addition the scoliosis has caused also sternum deformation.

[1] The photographic documentation of the case was also reviewed by Dr. R.W. Mann from Department of Anthropology, Smithsonian Institution, Washington DC.

In the upper part of rib hump the ribs were positioned flat and horizontal as the bone mass has to remain constant according to Baserhagen law.

Another pathological change was the aplasia in form of absolute absence of right humerus causing also morphological changes in right ulna where additional adaptive joint was formed. The hypoplasia of the right radius is also present. Both forearm bones shows signs of congenital radial-ulnar synostosis. This confirms that the absence of humerus is congenital but the changes in forearm and hand are only partially of congential origin, as the ulna was adaptationally changed, thus excluding *phocomelia thoracalis* as a diagnosis (congenital absence of both arm and forearm). The changes observed can then be diagnosed as upper extremity anomaly known as *ectromelia brachialis* (**Fig. 3**).

Diagnosis of changes as a congenital disorder does not give a clue to their endogenous or exogenous character i.e. inherited genetic cause or ecosensitive, environmental origin. It is widely known that such anomalies occur as result of using chemical substance called colchicine, which inhibits mitosis during foetal life. Parallel changes take place also as the result of thalidomide intoxication, also during foetal life. In conclusion such developmental disorders can be caused by hormonal disturbances or even malnutrition. We have to admit that these causative agents could have been responsible for congenital disorders of peoples from the more distant past (**Figs 4, 5, 6, 7**).

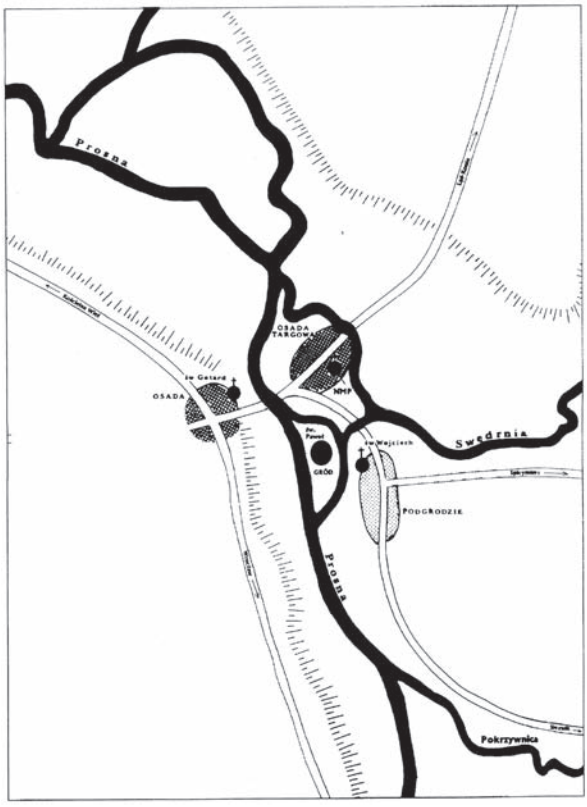

Fig. 1a. Kalisz-Zawodzie archaeological site.

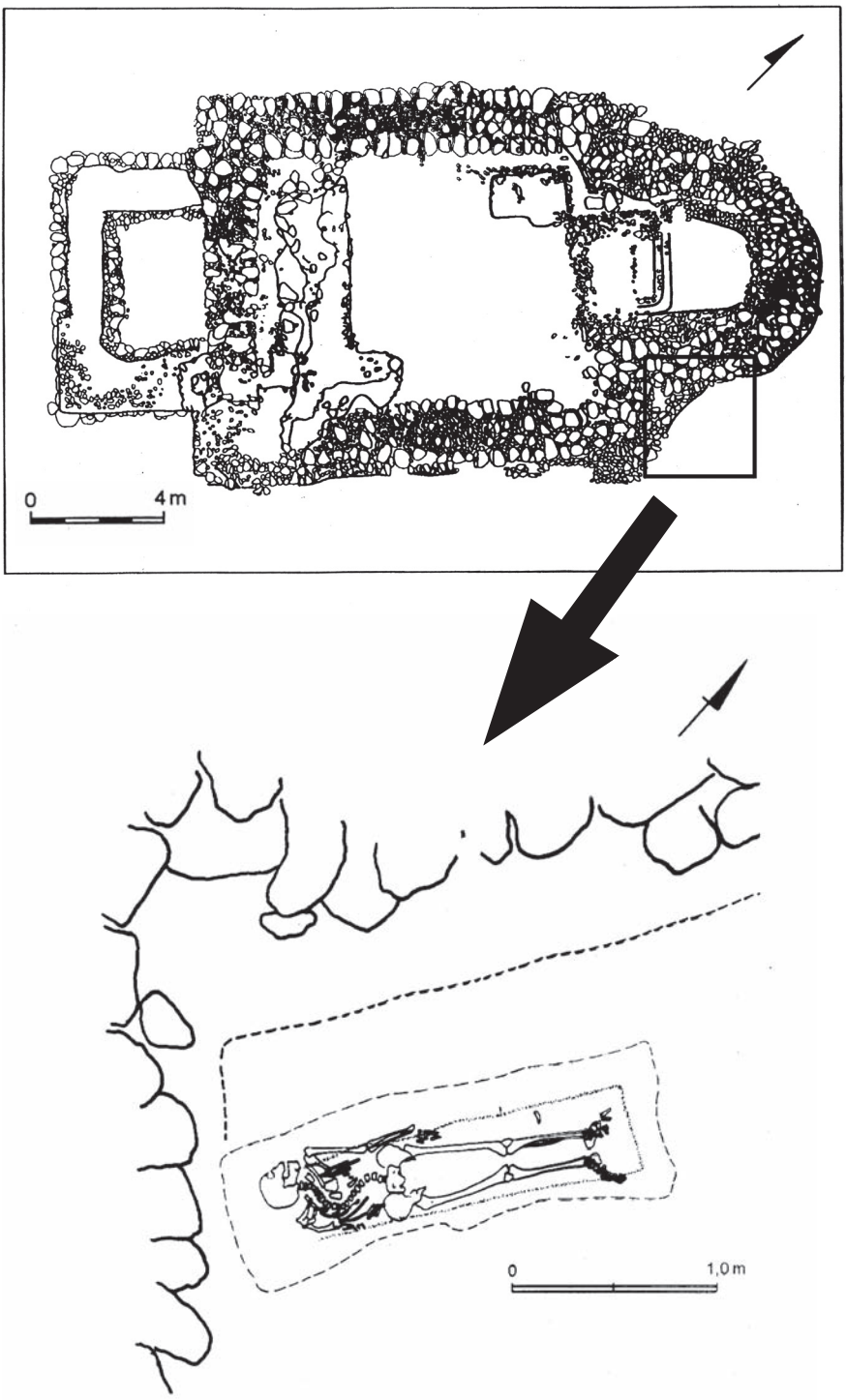

Fig. 1b. Location of the grave 4/88.

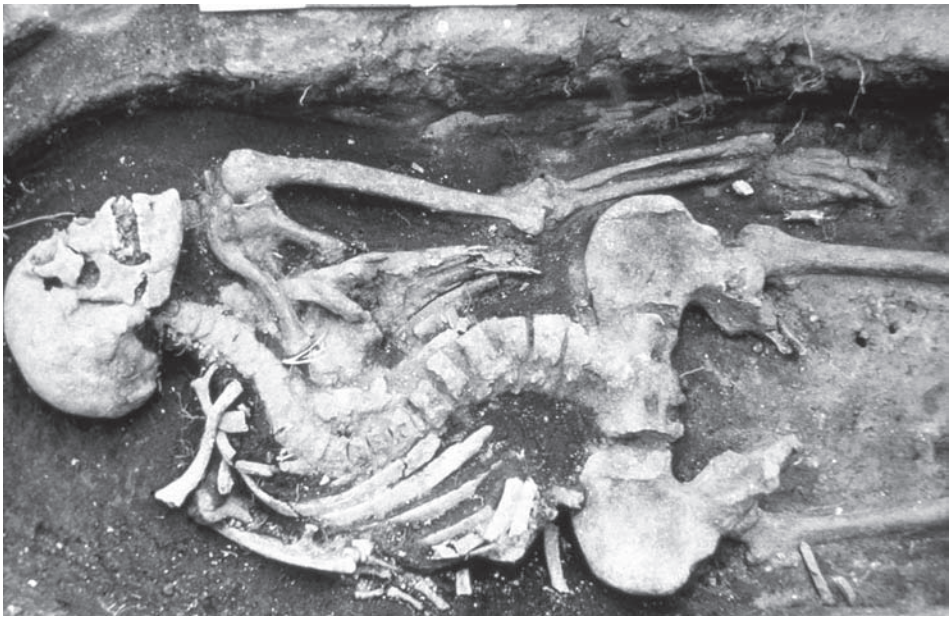

Fig. 2. Burial in situ.

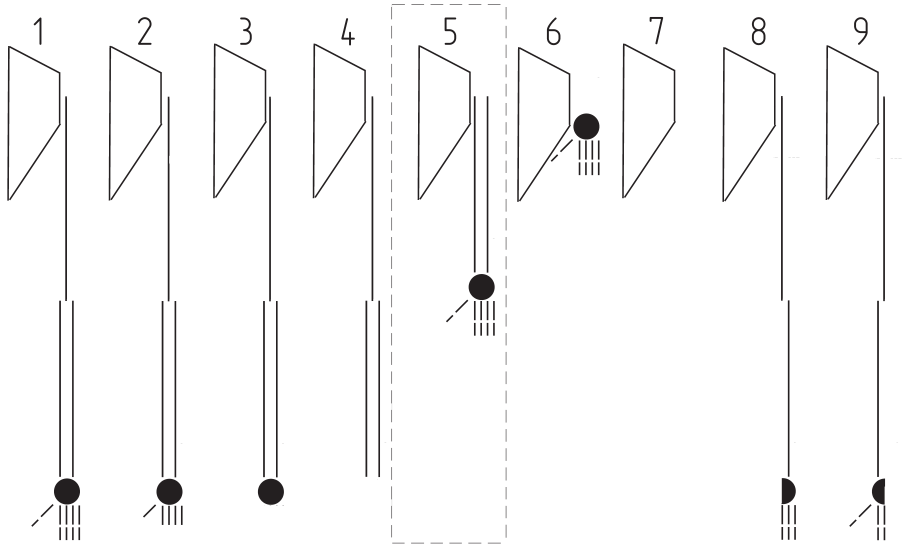

Fig. 3. Schematic representations of different defects and deficiencies of upper extremity. The model 5 refers to researched skeleton (grave 4/88), describing *ectromelia brachialis* (sometimes called also *peromelia*). There is aplasia i.e. absence of right humerus present. It is replaced by ulna and radius fused by radial-ulnar synostosis with adaptive changes of one of the forearm bones. The absence of the bone can be complete (model 7) or incomplete. They can apply to one or more extremities, can also be symmetrical or asymmetrical (W. Dega, *Ortopedia i rehabilitacja*, vol. 1, 1983).

Fig. 4. Axial skeleton with pronounced right-sided scoliosis.

Fig. 5. Synostosis of right ulna and radius, adaptive change caused be aplasia of the right humerus.

Fig. 6. Clavicles, scapulas and sternal manubrium.

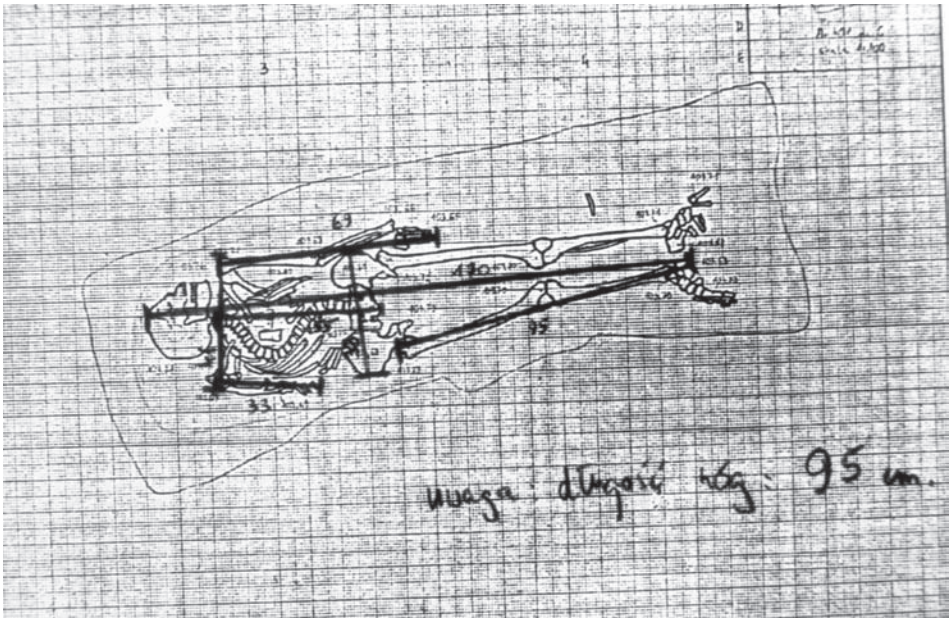

Fig. 7. Skeletal length *in situ* was measured as about 170 cm, the height of the individual calculated according to Lee-Pearson formula is 178.5 cm. The reason of the difference are the observed pathological changes.