

THE PATHOLOGY OF THE PREHISTORIC
AMERICAN INDIANS OF THE ILLINOIS
RIVER VALLEY

BY

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The pathologic conditions encountered in the prehistoric American Indian are among the most interesting features of American archaeology. During the past four summers (1926-1930) the University of Chicago Archaeological Survey has been excavating Indian mounds in the Illinois River valley, and the material thus obtained has yielded a number of noteworthy pathologic specimens. Among these are five examples of Paget's osteitis deformans and a remarkable case of osteitis fibrosa, as well as fractures and congenital anomalies. Osteitis deformans, a chronic bone disease of unknown origin, occurs in individuals usually beyond middle age and affects from one to many bones of the skeleton, the skull rarely being uninvolved.¹ Osteitis fibrosa is related to osteitis deformans anatomically and pathologically, but it is distinct clinically and morphologically, and occurs in the earlier decades of life.² There is a recent tendency to group these two conditions, along with osteomalacia, under the clinical term of osteodystrophia fibrosa.

The skeletal material presenting these conditions is estimated to be approximately 1,000 years old. This chronological position is based upon the fact that the mound from which the skeletons were obtained belongs to the last of the three bluff cultures, which is intermediate between the Hopewell culture (2000 years old) and the beginning of the Columbian era.

This article is concerned with a hemimelic individual and the various types of fractures which we have encountered during the excavations.

A curious anatomic anomaly was excavated by the University of Chicago Archaeological Survey from mound F14, Fulton County, Lewistown, Illinois, in the summer of 1930.

¹ Denninger, H. S., Paleopathologic Evidence of Paget's Disease, to be published in the *Annals of Medical History*.

² Denninger, H. S., Osteitis Fibrosa in a Skeleton of a Prehistoric American Indian, *Archives of Pathology*, June, 1931, Vol. 11, pp. 939-947.

This deformity, undoubtedly of congenital origin, occurs in the lower portion of the right humerus of skeleton F14-62, a female of approximately eighteen years of age. The right humerus is considerably smaller than the normal left, its greatest length being 26.8 centimeters whereas the left humerus measures over all 34 centimeters. Its shaft is ill-formed presenting only vaguely a few of the characteristic markings. The region of the deltoid tubercle is only slightly raised and roughened above the smooth level of the shaft. The musculo-spiral groove and curve are absent.

The head of the right humerus is a small irregular knob of bone about 3 centimeters in diameter. Its articular surface is roughened by two sets of concentric rings which correspond and fit approximately into a similar set found in the glenoid cavity of the scapula. The inter-tubercular sulcus is not present. The epiphyseal line between the head and shaft is still quite obvious and a similar demarcation may be seen on the left humerus.

Below the middle third of the shaft curious bone formations are to be found. The shaft flattens out here forming a spoon-like piece of bone with its concavity directed toward the median plane. This portion of the bone, if isolated, would suggest the acromial end of the clavicle. At the end of this there are three, possibly four, malformed minute articular surfaces. These most probably articulated with a small nodule of bone presenting an irregular array of small facets. Only one such piece was found but judging from its non-descript character and the arrangement of the facets, more than one of these bones must have existed during the life of the individual.

From the region where the flattening of the shaft begins there extends anteriorly a thin lamina of bone which gradually thickens as it progresses outward and assumes the shape of the very distal end of a young humerus. The size of this humeral-like projection is comparable to that of a normal humerus at the age of twelve. The lower portion of this projection is connected with the anterior edge of the spoon-like shaft by a bony ridge, thus leaving an elongated eliptiform space between the two.

Associated pathologic changes are found in the right scapula which is noticeably smaller in all its measurements. Its wing is very thin and wedge-shaped and the acromial process is about one-half the size of that of the normal left scapula. The glenoid fossa is atrophic being only about 2.5 centimeters in diameter and as previously mentioned presents a series of irregular roughened rings. The right clavicle is correspondingly small in size but contains no abnormal features. The

bones of the shoulder girdle as here described show little evidence of true retrogressive changes, but do indicate arrest of development at an immature stage.

During the excavation of the skeleton it was carefully noted that none of the bones of the forearm or hand could be found, and further there was no trace of evidence to even suggest that they had come into the grave, or had been possessed by the individual at death. Only the irregular nodule of bone noted was found in proximity to the distal end of the right humerus. These facts indicate that we are considering here a hemimelus, namely the absence of the right forearm and



FIG. 1. Photograph of skeleton F 14-62 in situ. The atrophic condition and peculiar formation of the lower end of the right humerus is clearly shown. Note the marked difference in size and shape between the humeri and the small bony nodule just below the distal end of the right humerus.

FIG. 2. Detail photograph of the anomalous humerus and bony nodule described in text.

hand. The latter are however probably represented in the small bony nodules already discussed. The possibility of a superimposed supracondylar fracture with healing in mal-position must be taken into consideration, for even with the congenital anomaly described such an accident to the arm at an early age would aid in accounting for the curious projection which so closely simulates the distal end of an immature humerus.

The evidence of fractures among these prehistoric people is not so common, in our experience, as would be expected. We have found

only five definite examples (all types) in a total of three hundred twenty individuals, or approximately 1.5 per cent. This paucity is striking in view of the 7.2 per cent of fractures of all types reported by E. A. Hooton in his study of the Pecos Indians.³ In his series many present serious complications and sequelae such as non-union, evidence of infection, and excess callus formation, indicating as he suggests a belligerous origin, while our specimens show at most healing with mal-union. A more peaceful type of fracture, as it were.

The fractures of the long bones which we have encountered introduce essentially no features differing from those abundantly described in the paleopathologic literature, and a detailed description of them would hardly justify the repetition involved. We may note briefly, then, the following individual fractures.

One skeleton from the Parker Heights Mound at Quincy, Illinois, presented a semi-spiral fracture of the right humerus with two inches of overriding, little callus formation and retention of good position in the distal portion for the "carrying angle." In the Oakwood Cemetery Mound at Joliet, we encountered two individual specimens of long bone fractures in a group burial. One is an oblique fracture of the left femur, remarkably healed, with fair approximation, slight anterior bowing, and lateral rotation. The other is a splintered fracture of the mid-shaft of the left tibia in which the fragments healed in mal-union, with some anterior bowing and moderate callus formation.⁴ In a disturbed burial from Mound F 14 at Lewistown we obtained a healed fracture of the clavicle from an individual approximately eighteen years of age.

During the four summers work only one definite skull fracture has been encountered. It occurs in the skull of skeleton F 58-13 (adult) obtained from the Tampico Mound near Lewistown. The fracture is of the depressed type, being somewhat oval in shape (2.5 x 1.5 cm.) and located about one centimeter anterior to the coronal suture between the left inferior and superior temporal ridges.^{5,6} The outer surface of the depressed bone fragment ranges from 1 to 3 millimeters below the external cranial table. In the process of healing, bone deposition has made the edges between the fragment and the external

³ Hooton, E. A., *The Indians of the Pecos Pueblo, A study of their Skeletal Remains*, Yale Univ. Press, Chap. X, p. 312 ff, New Haven, 1930.

⁴ Langford, G., has reported a number of interesting fractures from the Joliet region. The Fisher Mound Group, *Successive Aboriginal Occupations Near the Mouth of the Illinois River*, Amer. Anthro., Vol. 29, No. 3, 1927. Plates XI and XXXI.

⁵ The diagnosis of linear, radiating, and puncture skull fractures is always a matter of considerable difficulty, particularly when there is no obvious or probable point of injury. Anti-mortem linear and radiating fractures must be differentiated from the simulating post mortem type of fracture produced by earth pressure in the grave, or the drying and warping fracture often appearing within forty-eight hours after excavation.

⁶ Langford, *Op. cit.*, reports a possible arrow point wound of the right frontal bone, plate XXVII, p. 195.

table smooth and continuous. The inner surface of the fragment presents evidence of active osteogenesis, being heavily pitted and extending irregularly 6 to 10 millimeters below the ground level of the internal cranial surface. The lesion is situated over the cortical areas assigned to movements of the head and motor speech, and probably involved frontal branches of the middle meningeal artery. Although this individual lived after the accident, as evidenced by the healing, a discussion of his symptomatology would be exceedingly hazardous.