McCUNE-ALBRIGHT SYNDROME

Report of a Male Patient

Nihat Bilginturan, M.D.*

In 1937 McCune[1] and later Albright et al[2] described a syndrome in girls in which sexual precocity was associated with areas of increased skin pigmentation and with scattered areas of osseous rarefaction. The bone disease was the most striking feature of the syndrome and Albright considered it as a special entity, thus separating the lesion from the fibro - osseous group of conditions in which they had previously been included. In 1938 Lichtenstein[3] suggested the term «polyostotic fibrous dysplasia» because of the characteristic histologic appearance of the bone lesions. With the recognition of the monostotic form by Lichtenstein and Jaffe,[4] the bone disease was designated fibrous dysplasia. One year later using Albright's original thesis, Albright and coworkers[5] emphasized that the disease was an entity distinct from neurofibromatosis and hyperparathyroidism.

The purpose of this paper is to present a case of McCune-Albright syndrome in a boy, which is very rarely encountered.

Case Report : An eight year old male (HCMC. No 62/27518) was admitted to Hacettepe Children's Hospital Medical Center for an evaluation of abnormally large skull and genitalia and bowing of the legs.

The patient's mother had had a normal pregnancy and delivery and the child had had no difficulties at delivery or in the immediate neonatal period. The only abnormality noted at delivery were multiple hyperpigmented areas located on the face, neck, trunk and extremities.

There were no problems encountered during infancy, and the child had the normal developmental milestones. Following the onset of walking, the mother noted that the child's legs were bowed and that the size of his head and external genitalia were somewhat larger than to be expected.

At the age of four, the child broke his right leg, and at the age of six years his left leg following a fall. Although both times the fractures were corrected the patient continued to complain of pain in his legs until the time of examination.

At the age of six years, the patient was seen in the out patient department and the diagnosis of McCune-Albright Syndrome was made on the basis of bone lesions, pigmentation and sexual precocity. Because of the increased bow-

---

From Ankara University Hacettepe Medical Faculty and Hacettepe Children's Hospital.

* Pediatrician, Department of Pediatric Endocrinology.

ing and pain of the legs and failure at school, he was brought to the hospital for further evaluation.

No family history of bone or joint disease or skin lesions similar to those of the patient were noted, and there was no history of sexual precocity in the family. The mother, father and seven siblings of the child seem in good health.

On physical examination it was noted that the child was small but heavy for his age. His height was 119 cm and his weight was 34 kg. Positive observations included a slightly dull appearance, a large sized head with a circumference of 62 cm (Figure 1) and a bony enlargement of both orbital ridges. There

Figure 1.

were areas of acne on his face, a shaved mustache and many cafe-au-lait spots located on the left side of his face and neck, bilaterally on his back, on the midline below the umbilicus and both lower extremities. A marked bowing of the arms and legs (Figure 2) and almost adult sized genitalia (Figure 3) were present. His penis measured 6x3 cm and testes 4x3 cm with dark colored pubic hair.

Figure 2.

Laboratory data : The hemogram, urinalysis were within normal limits and PPD was negative. The serum calcium level was 11 mg per cent, serum phosphorus level 3.6 mg per cent, alkaline phosphatase level was 29.4 Bodansky units and NPN was 30 mg per cent. On two occasions 24 hour urine showed that 17 ketosteroids were 12.4 and 10.0 mg/24 hours. Urinary gonadotropin (FSH) level was measured as 6.6 mouse unit. EEG and visual field examination were within normal limits. His mental age was found to be 6 years and 8 months with an intelligence quotient of 83.

Roentgenograms of the skull displayed thickening of the diploic space and general fuzziness of the bones with small radioluscent areas within the partially sclerotic bones. There was also platybasia (Figure 4). Roentgenograms of the pelvis and femoral regions revealed narrowing of the bony pelvis giving it a triangular shape, the iliac bones appeared sclerotic and the trabeculation was lost. Femoral regions showed thinning of the cortex with loss of normal trabeculation of the bones. There was marked bowing of the femurs with outward convexity. Proximal regions of the femurs showed large cystic areas (Figure 5). Upper and lower extremities also showed thinning of the cortex

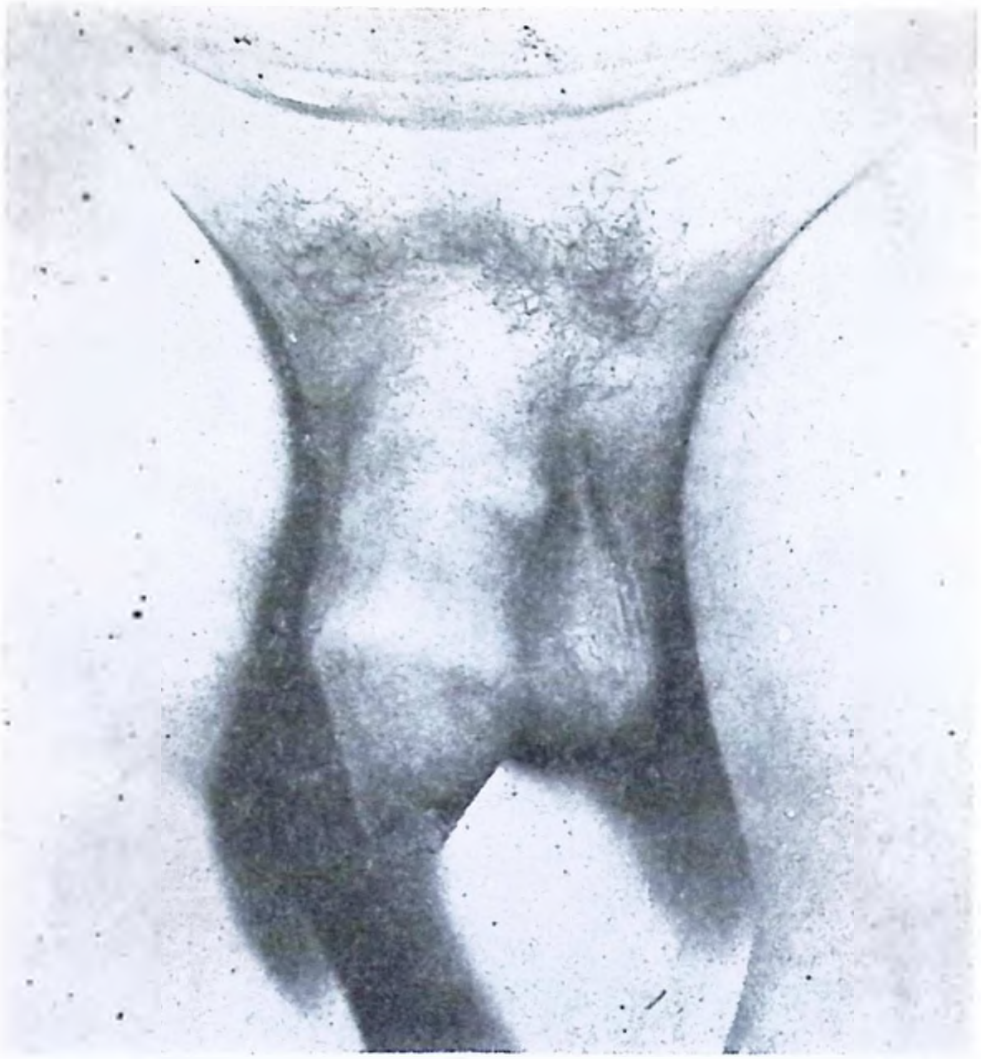

Figure 3.

Figure 4 a.

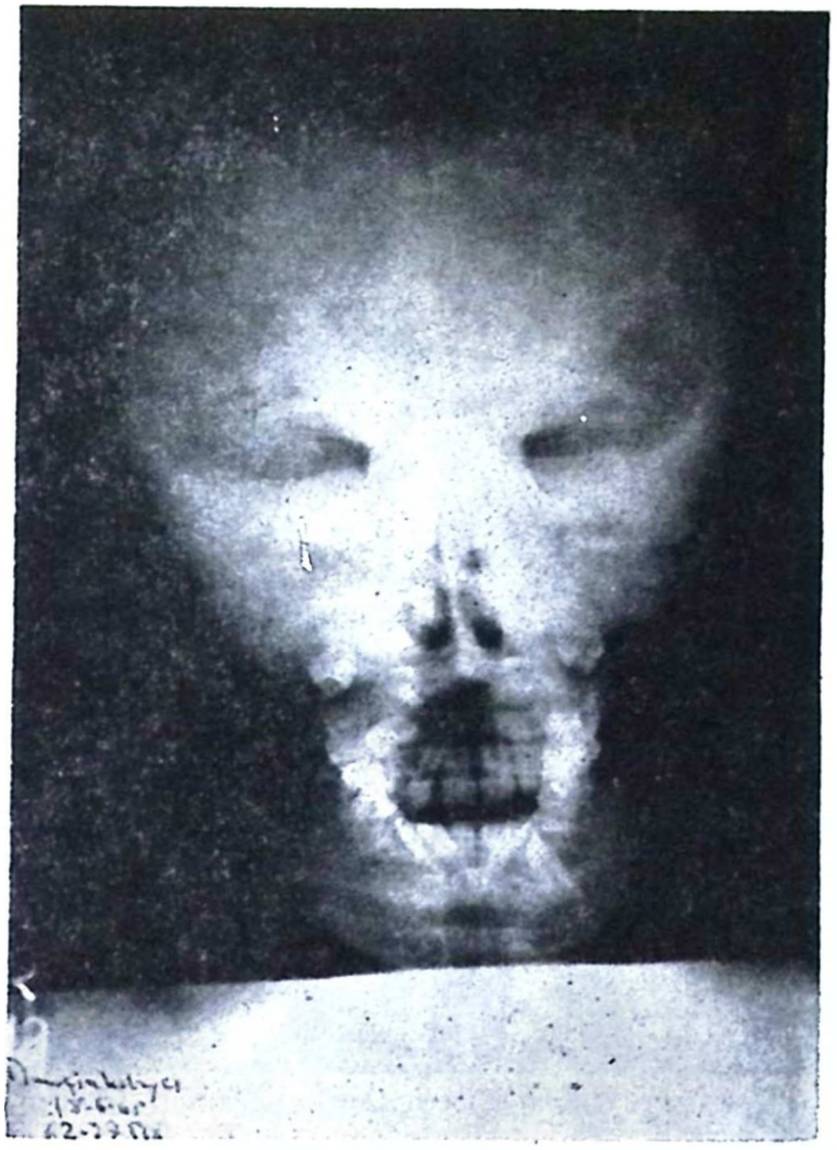

Figure 4 b.

with loss of normal bony trabeculation and tubulation. Epiphyseal lines seemed unaffected.

A-P films of both hands and wrists demonstrated an increased width of the phalanges and metacarpals giving them a somewhat square appearance (Figure 6). Bone trabeculation was roughened. There were radioluscencies in the bones inclusive of the carpals. Bone maturation appeared within the range of fourteen years.

Discussion

McCune-Albright Syndrome is a triad which includes characteristic bone lesions (monostotic or polyostotic), non-elevated pigmented areas with irregular borders and sexual precosity: the later previously seen exclusively in females. The full-blown syndrome is rarely seen in males. To our knowledge there are only five reported cases in the literature. Danowsky[6] summarized all of the reported

Figure 5 a.

Figure 5 b.

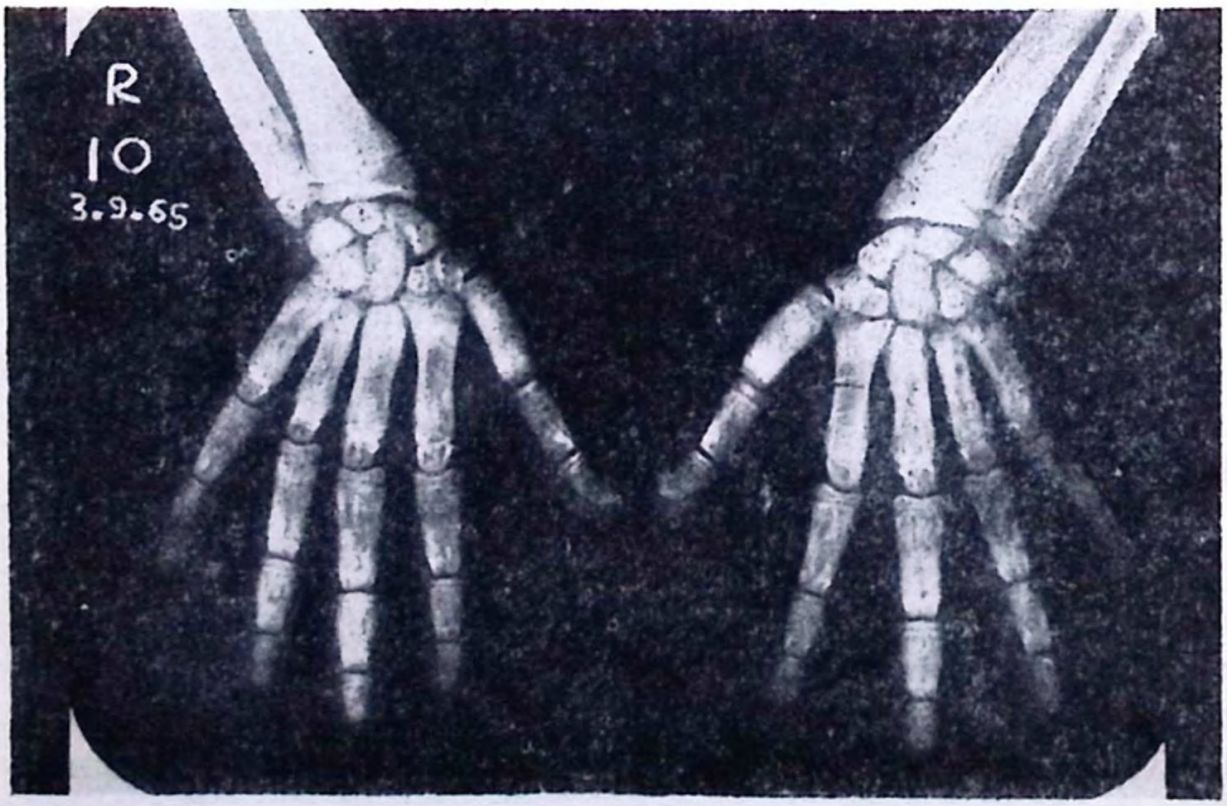

Figure 6.

cases of sexual precosity associated with polyostotic fibrous dysplasia in his textbook which includes three males. One of them had been reported by Falconer and Cope,[7] and two by Warrick.[8] In addition to these three cases, Wilkins[9] in his textbook mentioned two other cases which had been reported by Jolly.

The mechanism of the sexual precocity in this syndrome is not yet explained. According to Albright's original suggestion, the sexual precocity in these patients is the result of cerebral or hypothalamic compression or other changes secondary to deforming the fibrous dysplasia of the bone of the skull. However in a recent publication Benedict [10] has a moderately large series of ten cases of sexual precocity in females with associated fibrous dysplasia. In the series there are only four cases which have bone lesions at the base of the skull, and neither mature gonadal function nor demonstrable pituitary gonadotropic hormones were observed in these patients. This would suggest that the sexual precocity associated with Albright's syndrome differs from precocity resulting from cerebral or central nervous system lesions and also differs from constitutional precocious puberty.

Novak has written that constitutional precocious puberty has a genetic basis and recent demonstrations of an abnormal number of chromosomes (47 and 48) in a patient with constitutional precocious puberty [11] supports this theory. No such chromosomal abnormality has as yet been demonstrated in cases of sexual precocity in females having Albright's syndrome. On the other hand, there is some indirect evidence that sexual hair and increased rate of growth in this syndrome can be explained by a functioning adrenal cortex. [12] Although there were no signs of functioning adrenal cortex among reported cases in the literature with the exeption of Falconer's case which had a 17-Ketosteroid value 6.0 and 6.8 mg per 24 hours which falls within the puberal level.

Summary

Our patient showed bone lesion of the skull and high 17-ketosteroid value. On the other hand he showed FSH level 6.6 mouse units which is within normal limits for adolescent males. On the basis of a normal FSH level and high 17-ketosteroid value we consider it as precocious puberty rather than sexual precocity. In that respect our patient appears unique in that, to our knowledge, this is the first reported case of McCune-Albright Syndrome in which sexual precocity is associated with mature gonadal functions.

REFERENCES

1. McCune, D. J. and Bruch, H.: Osteodystrophia fibrosa; report of a case in which the condition was combined with precocious puberty, pathologic pigmentation of the skin and hyperthyroidism, with a review of the literature, Am. J. Dis Child. 54 : 806, 1937.
2. Albright, F., Butler, A. M., Hampton, A. O., and Smith, P. : Syndrome characterized by osteitis fibrosa disseminata areas of pigmentation and endocrine dysfunction, with precocious puberty in females; report of 5 cases, New England J. Med. 216 : 727, 1937.
3. Lichtenstein, L. : Polyostotic fibrous dysplasia, A.M.A. Arch Surg. 36 : 874, 1938.
4. Lichtenstein, L., Jaffe, H. L. : Fibrous dysplasia of bone: a condition affecting one, several or many bones, the gravest cases of which may present abnormal pigmentation of skin, premature sexual development, hyperthyroidism, or still other extraskeletal abnormalities, A.M.A. Arch Path. 33 : 777, 1942.
5. Albright, F., Scoville, B., and Sulkowitch, H. W. : Polyostotic fibrous dysplasia: a defense of the entity, J. Clin. Endocrinol. 7 : 307, 1947.
6. Danowski, T. S. : Clinical Endocrinology; Calcium, Phosphorus, Parathyroids and Bone. Chapter 32, The Williams and Wilkins Company, Baltimore, 1962.
7. Falconer, M. A., and Cope, C. L.: Fibrous dysplasia of bone with endocrine disorders and cutaneous pigmentation (Albright's disease), Quart. J. Med. 35 : 121, 1942.
8. Warrick, C. K. : Polyostotic Fibrous dysplasia. Albright's Syndrome: a review of the literature and report of four male cases, two of which were associated with precocious puberty, J. Bone and Joint Surg 31-B: 175, 1949.
9. Wilkins, L. : The diagnosis and treatment of endocrine disorders in childhood and adolescene, Chapter XI, Second Edition, Springfield, Charles C. Thomas Company.
10. Benedict, P. A.: Endocrine feature in Albright's syndrome (Fibrous dysplasia of bone), Metabolism 11 : 30, 1962.
11. Sandberg, A. A., Koepf, G. F., Crosswhite, L. H., and Hanschka, T. S. : The Chromosome constitution of human marrow in various developmental and blood disorders, Am. J. Human Genet. 12 : 231, 1960.
12. Albright, F., Smith, P. H., and Fraser, R. : Syndrome characterized by primary ovarian insufficiency and decreased stature: report of eleven cases with a digression on hormonal control of axillary and pubic hair, Am. J. M. Sc. 204 : 625, 1942.