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McCune-Albright Syndrome: A-Rare-Case Report

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ABSTRACT

McCune-Albright syndrome (MAS) is a rare genetic disordered originally recognized by the triad of polyostotic fibrous dysplasia, precocious puberty, and cafe-au-late spots. We report a case of 2 years-11-month-old girl who came with complaints of menstruation 5 days ago. Breasts appear enlarged. On physical examination, it appears that the café au lait region of the abdomen and left femur resembles the "coast of Maine". There was an increase in the levels of FT4, estradiol, and alkaline phosphatase, and low TSHs, LH, and FSH levels. The radiological examination of the bones of the left hand corresponded to the bone age of 6 years. Bone survey photo showing multiple lytic and blastic lesions in the proximal 1/3 of the left femur. We are monitoring this patient, and planning to administer Tamoxifen and Zoledronic acid. Tamoxifen (an estrogen agonist/antagonist) or Letrozole (an aromatase inhibitor) have been used for the management of precocious puberty and rapid bone maturation. Despite differing in presentation, all patients with precocious puberty were successfully treated with Tamoxifen and/or Letrozole, to emphasize the significant progress of bone age. A systematic approach to diagnosis and management is essential to optimize outcomes for patients with MAS, especially with fibrous dysplasia. No medical therapy is able to change the course of the disease in fibrous dysplasia. However, screening and treatment for endocrinopathy can reduce some bone morbidities.

Keywords: Fibrous Dysplasia; polyostotic; puberty; precocious; aromatase inhibitors

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Introduction

Multiple endocrinopathies, early puberty, polyostotic fibrous dysplasia, which causes deformities and pain in the legs, spine, and face, and skin alterations in the form of café au lait macules are all signs of McCune-Albright Syndrome.[1]

Although complete information on the prevalence of MAS is not yet known, it is estimated that it affects between 1/100,000 and 1/1,000,000 worldwide. Contrarily, information on skeletal abnormalities brought on by MAS in the form of fibrous dysplasia has been widely published; it is estimated that this condition accounts for more than 7% of benign bone tumor cases.[2,3]

The endocrinopathies seen in this condition today include several endocrine disorders, such as hyperthyroidism, acromegaly, phosphate wasting, and Cushing syndrome. A somatic activating mutation of the GNAS gene, which is found in many different tissue types, is the cause of the varied constellation of symptoms.[4] Here, we report one patient with McCune Albright Syndrome, a rare disease, who was treated at our institution.

Case

A-2 years and 11-month girl came with complaints of menstruation 5 days ago. The breasts appear enlarged 2 weeks before admission to the hospital. The patient had brown patches on the abdomen and left thigh which had been observed since birth with irregular shapes.

On physical examination, the breasts appeared to be enlarged, the *café au lait* region of the abdomen and left femur appeared to resemble the *coast of Maine* (Figure 1). Anthropometric status within normal limits.

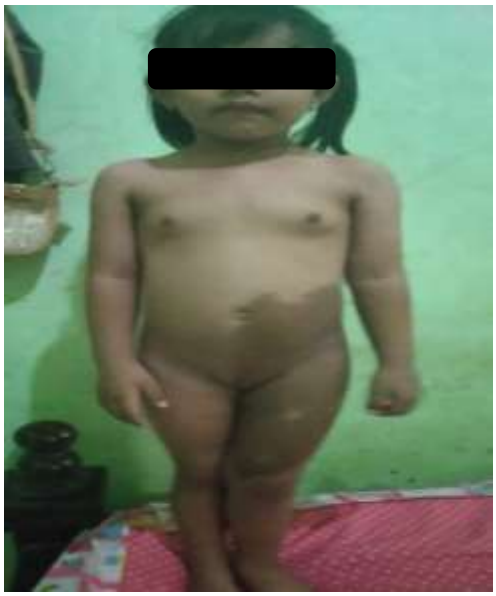

Figure 1. Our patients with breast augmentation, and café au lait

On laboratory examination, there was an increase in alkaline phosphatase (317 U/L), an increase in FT4 (3.22 ng/dl), and increase in estradiol (37 pg/ml) was found. Decreased TSH (<0.05 mIU/ml), decreased LH (0.12 mIU/ml), decreased FSH (<0.1 mIU/ml), Vitamin D (39 ng/dl) and Calcium (8.3 mg/dl) were within normal limits. FT4 results in this patient initially increased, but after 3 months of monitoring, FT4 was found to be decreased and within normal limits.

On bone radiological examination, the patient's estimated bone age was 6 years old (according to Greulich and Pyle), and osteopenia with coarse trabeculae was consistent with the appearance of fibrous dysplasia. (Figure 2). The x-ray of the lower extremities also showed multiple lytic and blastic lesions in the proximal 1/3 of the left femur (Figure 3).

On thyroid ultrasound, it has the impression of bilateral nodular goiter involving the isthmus and bilateral colli regional lymphadenopathy level Ib, level II, level III, level IV, and level V. On abdominal ultrasound, there was an adnexal cyst sinistra.

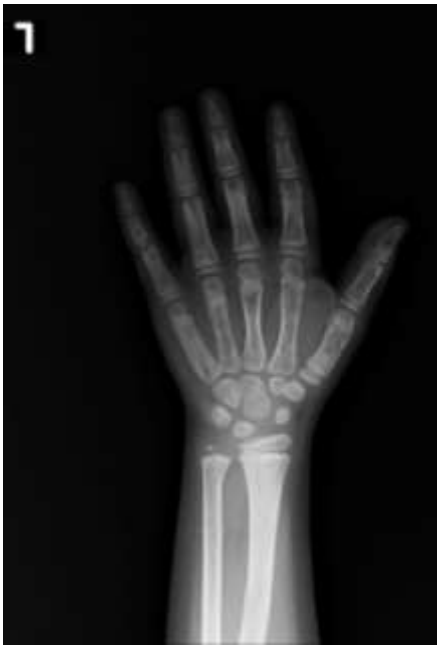

Figure 2. Her bone age was 6 years old, and osteopenia with coarse trabeculae

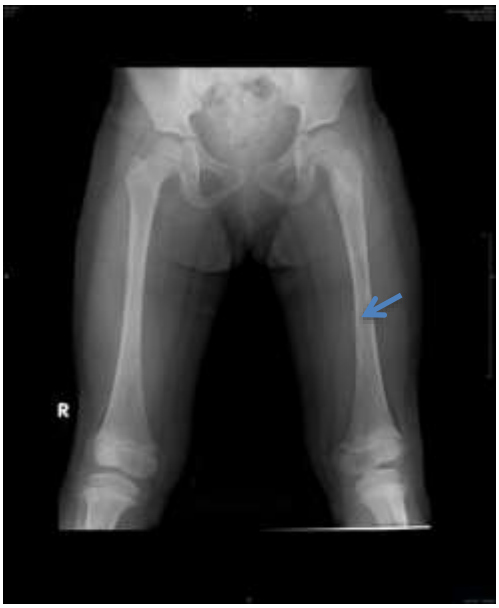

Figure 3. Multiple lytic and blastic lesions in the proximal 1/3 of the left femur

The management of our patients is monitoring the general condition of the patient including subjective complaints and vital signs and also providing explanations to the family to understand the patient's condition and play a role in its management so that optimal growth and development can be achieved. We treat our patient with calcium and vitamin D supplementation for maintenance of calcium and vitamin D levels and plan to give Tamoxifen and Zoledronic acid. The management of hyperthyroidism in this patient is observation because, in monitoring, there is a decrease in FT4 levels, if under monitoring, FT4 increases again, hyperthyroidism therapy will be given.

Discussion

Our patient was diagnosed with McCune-Albright syndrome (MAS) based on physical examination, laboratory, and radiology examination. MAC is a rare mosaic disorder that presents along a broad clinical spectrum.[5] Historically, MAS has been described as the triad of fibrous dysplasia (FD) of the bones, café-au-lait skin color, and peripheral premature puberty (PP). Phosphate depletion, newborn hypercortisolism, excess growth hormone, and hyperthyroidism are other related hyperfunctioning endocrinopathies.[5,6]

The clinical manifestations of McCune-Albright syndrome vary greatly. Precocious puberty in girls is a typical early symptom, and repeated ovarian cysts can cause vaginal bleeding and breast development.[15] Precocious puberty, which manifests as penile growth, pubic and axillary hair, acne, body odor, and sexual behavior, is less common in boys. Like the patient who has enlarged breasts and menstrual complaints, Because of the activity of the luteinizing hormone, precocious puberty occurs (LH).[7,8]

Our patients also feature Café-au-lait. Café-au-lait spots are seen in 53-95% of MAS cases with the

characteristic macula being on one side, not crossing the midline of the body, and generally distributed in the chest, neck, and groin areas. Irregularly shaped blotchy edges resembling the coast of Maine. They are often the first clinically apparent manifestations of MAS, presenting at or shortly after birth[9,10]

Several other endocrinopathies and other tissue involvement have been reported in the literature.[1,7] Hyperthyroidism was present in our patient. Hyperthyroidism is common in 10%-30% of MAS patients. Hyperthyroidism in this syndrome occurs due to mutations in the G protein at the level of thyroid-stimulating hormone (TSH). Uncontrolled hyperthyroidism can lead to increased bone age.[11]

On radiological examination, our patient impression of fibrous dysplasia. On radiographs, fibrous dysplasia typically has a look that is referred to as "ground glass." Long bone lesions typically have a "lytic" appearance. As in our case, radiologically, multiple lytic and blastic lesions were found in the proximal 1/3 of the left femur.[12] The lesions typically start in the medulla and spread outward, replacing healthy bone and causing cortical thinning. Fibrous dysplasia of the bone is also a major manifestation of MAS.[11,13] The GNAS1 mutation makes adenyl cyclase chronically active, which boosts cAMP levels and promotes aberrant osteoblasts and hyperfunction of bone precursor cells. A gradual change from normal bone tissue to aberrant fibroosseos tissue distinguishes these dysplastic lesions. Pathological fracture, bone fragility, discomfort, and nerve compression are all consequences of this lesion's extension. The femur, tibia, humerus, and forearm are the bones most frequently fractured.[11]

MAS is managed by a diverse team of professionals based on the observed clinical indications. Women can utilize tamoxifen and aromatase inhibitors as the primary treatments for early puberty. Stable-state analogs of gonadotropin-releasing hormones are used to inhibit the hypothalamic-pituitary-gonadal axis in the case of the development of precocious puberty. Zoledronic acid has been used to treat patients with fibrous dysplasia, it can provide pain relief and reduction in bone turnover markers. Radioablation and antithyroid medications were originally used to treat hyperthyroidism. There are no set standards for fibrous dysplastic lesions. The emergence of discomfort, stress fractures, deformities, or functional loss is typical grounds for surgical stabilization, nevertheless.[14] The patient is receiving calcium and vitamin D supplementation. We plan to give Tamoxifen and Zoledronic acid, hypertiroidism undergoing monitoring and may receive drug therapy if hypertiroid progresses.

Conclusion

McCune Albright Syndrome (MAS) is a rare syndrome. Growth monitoring is necessary for patients with MAS. Pharmacotherapy should be considered for MAS that interferes with growth and worsens clinically.

Conflict of Interest

There is no conflict of interest

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