

## McCune-Albright Syndrome: A case report

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### Abstract:

Fibrous dysplasia is a benign bone lesion of unknown etiology. Bone involvement usually is solitary (monostotic). Multiple forms (polyostotic) associated with extra skeletal symptoms, particularly cutaneous pigmentation, endocrine dysfunction and precocious puberty is called McCune–Albright syndrome (MAS). We report the case of a 40-year-old man who presented with left mandibular body expansion and intermittent suppuration from the skin sinus tract formation since he was 18 years old. He had skeletal deformities, limping, and multiple skin pigmentation. X-ray revealed multiple fractures and radiolucent lesions in numerous bones. Laboratory analysis showed an increased serum alkaline phosphatase. Precocious puberty was determined upon taking the patient's history. The patient's height was 148 cm. Microscopic findings of the mandibular lesion, clinical presentation and X-ray findings were strongly diagnostic for MAS.

**Keywords:** Fibrous dysplasia - McCune-Albright Syndrome - polyostotic

### Introduction

McCune-Albright syndrome (MAS) is a sporadic disorder characterized by a triad of polyostotic fibrous dysplasia (FD), café-au-lait maculae and hyperfunctional endocrinopathies.<sup>1,2</sup> It is a rare disease with an estimated prevalence between 1/100,000 and 1/1,000,000.<sup>3</sup> The café-au-lait skin pigmentation consists of large hypermelanotic maculae of irregular and serpiginous (coast of Maine) borders, which occur mainly on the front, posterior area of the neck, buttocks, thorax, back, shoulder, and pelvis.<sup>4,5</sup> FD is a benign condition in which the medullary portion of the bone is replaced by poorly organized fibrous tissue with trabeculae of immature bone.<sup>6</sup> It may affect either a single bone (monostotic) or numerous bones (polyostotic).<sup>1</sup> It is caused by embryonic somatic mutations leading to the substitution of His or Cys for Arg at amino acid 201 of the alpha-subunit of the signal transduction protein Gs (Gs alpha).<sup>2</sup> Recent studies have shown a clonal origin for FD, suggesting that this lesion is neoplastic in nature.<sup>7</sup> The endocrine disorders associated with this disease may include precocious puberty, hyperthyroidism, pituitary adenomas, adrenal primary hyperplasia, hypophosphatemia, and ovarian

cysts.<sup>5</sup> Precocious puberty is the most common clinical presentation and girls are affected more than boys.<sup>1,4</sup> Here we report a case of MAS with this triad of symptoms who was not diagnosed clinically until the age of 40 years.

### Case report

The patient was a 40-year-old man who presented with left mandibular body expansion, skin sinus tract formation with intermittent suppuration from the age of 18 years. Clinical diagnosis was chronic osteomyelitis. History taking revealed multiple fractures of the ulna, humerus, femur and ribs with precocious puberty. Physical examination showed short stature (148 cm in height), skeletal deformities from previous fractures, limping, and multiple skin pigmentation with irregular borders (Figure 1). Laboratory findings included increased serum alkaline phosphatase. X-ray and CT scan findings revealed multiple healed fractures and lytic lesions of the extremities, ribs, and mandible with radiolucent, ground glass appearance and sclerotic borders (Figure 2). A biopsy specimen from the mandibular lesion showed woven abnormal islands of bone, large irregular fibrous tissue matrix (Figure 3), and granulation tissue with hemorrhage (Figure 4). Clinical presentation, X-ray findings and histopathology was strongly diagnostic for MAS. The patient was referred to an endocrinologist and orthopedist for appropriate management. He received alendronate, vitamin D3 and calcium and was also recommended to

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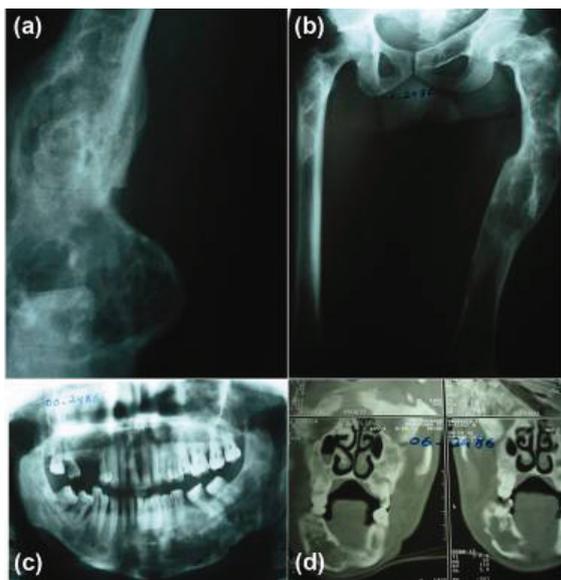
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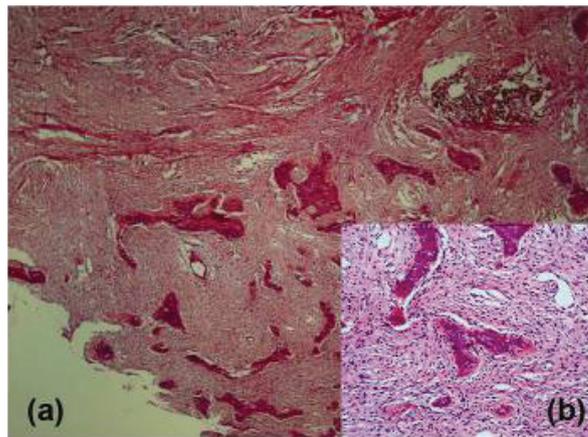
use safety shoes. Two years after diagnosis he had no other problems and the pain in his extremities had been relieved.



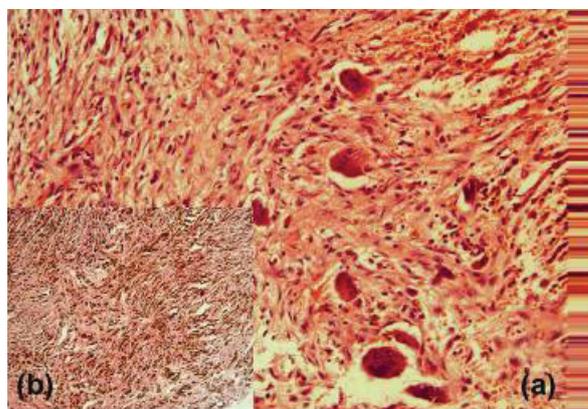
**Figure 1.** a) Short stature, b) skeletal deformity, c) Skin pigmentation



**Figure 2.** Radiography and CT scan of involved bones, a) elbow, b) femur, d) CT scan of jaws



**Figure 3.** Alveolar bone trabeculae in fibrous stroma; a) (H&E) 4x and b) (H&E) 20x



**Figure 4.** Fibrous stroma with: a) giant cells (4x), b) hemorrhage (H&E 10x)

## Discussion

MAS is a rare disorder that develops from an activating mutation in the *Gs* gene.<sup>2,8</sup> This abnormality leads to proliferation of osteoprogenitor cells without differentiation, therefore fibrous matrix with woven bone increase.<sup>1</sup> MAS is diagnosed on the triad of FD, endocrinopathy and hyperpigmentation of the skin.<sup>9</sup> The medical history of this patient included fractures and deformities of multiple bones similar to findings by Xavier et al. and Liang et al.<sup>5,8</sup> In our case disabling consequences (pain, fractures, etc.) continued into adulthood. Some studies have noted these problems.<sup>10</sup> The patient described in this paper presented with precocious puberty, facial asymmetry, mandibular enlargement, elevation in serum alkaline phosphatase level, short stature, limping and limb deformities. A report of two cases by Xavier et al. showed the same features with the exception of short stature.<sup>5</sup> Radiographic findings of bones are dependent upon the stage

of disease progression. Typical features of FD are a ground glass pattern with radiolucent, radio-opaque or mixed changes.<sup>11</sup> The radiographic findings of our case revealed typical features of FD, including ground glass pattern with radiolucency and granular picture with a sclerotic rim upon CT-scan. Similar findings were reported by Xavier et al., Medow et al., and Defilippi et al.<sup>5,6,12</sup> The histopathologic changes consisted of a loose fibrous stroma within which immature bone trabeculae were haphazardly distributed.<sup>5,6,13</sup> The histologic evaluation of our case showed these findings plus hemorrhage and granulation tissue due to a previous needle biopsy. There is no specific treatment for this syndrome which is generally symptomatic. Because of the great variety of lesions in this syndrome, treatment is specific for each patient.<sup>5,8</sup> Some data suggest that the cancer incidence in adulthood is increased in FD patients.<sup>1,14</sup> This paper reports a case of MAS in a 40-year-old man of a low socioeconomic rural community in whom diagnosis was delayed until the age of 40. His precocious puberty (although rare in males with MAS), multiple bone fractures and skin pigmentation were neglected. Therefore he had failed to receive appropriate management.

## Conclusion

Review of past medical history and physical examination of patients are the most important factors for correct diagnosis. Children with FD should be evaluated for endocrinopathies. The diagnosis of FD is essential in the differential diagnosis of patients with lytic bone lesions.<sup>6</sup>

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