

# Neurofibromatosis Type 1 associated with vitiligo and left occipital bone defect

I Bukhari, F Al Mulhim

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## Abstract

Neurofibromatosis type 1 (NF1) is a neurocutaneous disorder with variable clinical expression spectrum. Major clinical features include pigmentary changes, central nervous system tumors, bony dysplasias and ophthalmic features. In this report we document the first case in the literature of NF1 associated with vitiligo and unusual bony defect.

## INTRODUCTION

Neurofibromatosis type 1 (NF1) is an autosomal dominant neurocutaneous disorder which affects tissues derived from the neural crest.<sup>1</sup> Clinically it is characterized by neural tumors, cafe-au-lait spots, intertiginous freckling, Lisch nodules and skeletal defects including scoliosis, sphenoid wing dysplasia, bony distortion and local cystic and erosive changes.<sup>2</sup> In this paper we present the first case in the literature of NF-1 associated with vitiligo and partial absence of left occipital bone.

## CASE REPORT

A 25-year-old Saudi female and a known case of neurofibromatosis type 1 since childhood presented to our dermatology clinic at King Fahad Hospital of the University in AlKhobar, Saudi Arabia with generalized depigmented patches of four years duration. Clinical examination of the skin revealed the presence of depigmented lesions affecting the upper and lower extremities, axillary freckling, cafe-au-lait spots and multiple plexiform neurofibromas affecting the trunk and the upper and lower extremities (figure 1). An ophthalmic examination revealed the presence of lish nodules. Family history was positive for neurofibromatosis (her sister and grand mother affected). Radiological evaluation for the head and spine using CT scan and MRI revealed Left occipital bony defect replaced by fibrous membrane with adjacent isodense soft tissue mass lesion (figure 2,3). So we diagnosed the patient as a case of NF type 1 associated with vitiligo and partial absence of left occipital bone.

## Figure 1

Figure 1: Depigmented patches with obvious freckling and café au lait lesions affecting the upper arm of the patient.



**Figure 2**

Figure 2: Enhanced CT-Brain showing left occipital bony defect (two arrow heads) with adjacent enhancement of soft tissue mass lesion. No abnormal intracranial enhancement was seen.



**Figure 3**

Figure 3: MRI-Brain with axial T1WI revealed normal brain signal intensity and positive bony defect at the left occipital bone (arrow head) with adjacent hypointense soft tissue mass lesion.



## DISCUSSION

Neurofibromatosis type 1 (NF1) is one of the most common autosomal dominant neurocutaneous disorder with an

estimated prevalence of about 1 in 3500 individuals.<sup>3</sup> It is known for its highly variable clinical expression spectrum and approximately 30–50% of all patients lack a family history of the disease, representing new mutations of the NF1 gene.<sup>1</sup> The responsible NF1 gene was identified and sequenced in 1990,<sup>4,5</sup> and was found to be localized to chromosome 17q11.2 and spanning approximately 335 kb of genomic DNA.<sup>6</sup> Major clinical features are the pigmentary defects such as cafe-au-lait macules, axillary and inguinal freckling, the (sub)cutaneous and (diffuse) plexiform neurofibromas,<sup>7</sup> and the central nervous system tumors including astrocytomas, meningiomas, schwannomas, and ependymomas. Other dysplastic features include bony dysplasias such as kyphoscoliosis, sphenoid wing hypoplasia and vascular dysplasia. Ophthalmic manifestations include Lisch nodules, choroidal hamartomas, plexiform neurofibromas, retinal phakomas and optic nerve gliomas.<sup>2</sup> Common clinicopathologic consequences of NF1 include, e.g. learning disabilities, short stature, scoliosis, epilepsy, intracranial tumors and renal artery stenosis.<sup>1</sup>

The basic pathomechanism of developing those characteristic lesions in NF1 has been revealed when the affected chromosome was assigned. Specifically, the pigmentary changes which is our interest in this case, it was suggested that since the pigment producing melanocyte originates in the neural crest, the presence of pigmentary lesions due to changes in melanocyte cell growth and differentiation is to be expected.<sup>1</sup> In addition, cell culture studies have shown that the NF1 gene defect affects melanogenesis in epidermal melanocytes of NF1 patients,<sup>8</sup> resulting in the various hyperpigmentary changes seen in NF1. On the contrary, this does not explain the loss of pigmentation in the vitiliginous lesions seen in this patient. In conclusion, this is the first reported case of NF1 associated with vitiligo which can either be related to the genetic defect of NF1 disease or two separate diseases occurring in the same patient. This can only be resolved by other similar case reports. Regarding the bony defect seen in this patient, it is also the first reported in the english literature with NF1 which should be added to the bony dysplasias seen in NF1.

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**Author Information**

**Iqbal A. Bukhari**

Associate Professor, Dematology Department, College of Medicine, King Faisal University

**Fatma Al Mulhim**

Professor, Radiology Department, College of Medicine, King Faisal University