

## Case Report

# Bilateral plexiform neurofibroma in neurofibromatosis Type 1: A case report and literature review

Sharja Phuljhele, Kanwaljeet Singh Hura, Kanak Ramnani, Onkar Khandwal

Department of Pediatrics, Pt JNM Medical College & BR Ambedkar Memorial Hospital, Raipur, Chhattisgarh, India

## ABSTRACT

Neurofibromatosis Type 1 is a multisystem autosomal dominant neurocutaneous disorder. Plexiform neurofibroma involves peripheral and cranial nerves. It is usually congenital in origin and a frequent cause of morbidity and mortality.

**Keywords:** Neurofibromatosis Type 1, plexiform neurofibroma, scoliosis

## INTRODUCTION

Neurofibromatosis Type 1 (NF1) is an autosomal dominant disorder, occurs with a frequency of 1 per 2500-3300 births.<sup>1</sup> It occurs in all races and affects both genders equally.<sup>2</sup> It is caused by NF1 gene mutation, which is located on chromosome 17q 11.2.<sup>1</sup> It is the genetic disease with variable expression and total penetrance. Over 50% of cases occur spontaneously. It is due to a defect during an embryonic period before differentiation of the neural crest.<sup>2</sup> Neurofibromin, the gene product of NF1 gene, functions as a tumor suppressor. The mutation leads to loss of neurofibromin, which predispose the individual to various benign and malignant tumor.<sup>3</sup> Plexiform neurofibromas is benign nerve sheath tumor which has potential for malignant transformation in about 10% of NF1 patients into malignant nerve sheath tumor.<sup>4</sup> We are reporting a case of bilateral plexiform neurofibroma, which is not uncommon but unusual presentation.

## CASE REPORT

The 13-year-old boy presented with a complaint of chronic dry cough and progressive change in curvature of the spine for last 1-year. At the same time, his parents also noticed depression of the lower portion of his chest. Physical examination revealed scoliosis of thoracic and lumbar region with pectus excavatum deformity of the chest (Figure 1). The patient had multiple hyperpigmented macules of the smooth border and homogeneous appearance of more than 15 mm in size (café au lait).

The swelling over the left elbow was measuring 10.0 cm × 5.0 cm, which was hyperpigmented with a bag of worm sensation on palpation. Another plexiform neurofibroma was present over the ventral surface of the right forearm of 4.0 cm × 3.0 cm. It was present since 4 years of age and was slowly progressive in nature (Figure 2). He enjoyed good health in the past and had no tinnitus, vertigo, visual disturbances or convulsions. His scholarly progress was good. Endocrinal, developmental, and neurological examinations revealed no abnormality. Computed tomography scan of the head, complete ophthalmic checkup, and pure tone audiometry were normal.



**Figure 1:** Computed tomography scan showing dorsal spine scoliosis

### Corresponding Author:

Dr. Kanwaljeet Singh Hura, Department of Pediatrics, Pt. JNM Medical College & BR Ambedkar Memorial Hospital, Raipur - 495 001, Chhattisgarh, India. E-mail: drjeet19@gmail.com

© 2015 International Journal of Medical Science Research and Practice available on [www.ijmsrp.com](http://www.ijmsrp.com)



**Figure 2:** Bilateral plexiform neurofibroma

The 40-year-old father had multiple soft tissue cutaneous nodules throughout the body, which first appeared in puberty. Multiple hyperpigmented macules were also present. He was the only member of his family who had a manifestation of NF1.

## DISCUSSION

NF Type 1 (von Recklinghausen's disease) is a hereditary disorder caused by a mutation in the NF 1 gene. Neurofibromin, a protein product of NF 1 gene enhances the intrinsic hydrolysis of RAS from its guanosine triphosphate- to guanosine diphosphate - bound conformation. It is one of the common genetic disorders with a predisposition to cancer.<sup>4</sup>

The diagnostic criteria are two of seven cardinal clinical features:

1. Six or more café au lait macules over 5 mm in greatest diameter in pre-pubertal individuals and over 15 mm in greatest diameter in post-pubertal individuals
2. Two or more neurofibroma of any type or one plexiform neurofibroma
3. Freckling in the axillary or inguinal region
4. Optic glioma
5. Two or more lisch nodules
6. A distinctive osseous lesion like sphenoid dysplasia or thinning of the long bone cortex with or without pseudoarthrosis
7. A first degree relative with NF1.<sup>5,6</sup>

Above diagnostic criteria are highly sensitive and specific for adults but in children sensitivity is less. About 46% of children did not meet criteria by 1-year of age. Nearly 97% of children met these criteria by 8 years of age.<sup>7</sup>

Plexiform neurofibromas grow along the length of a nerve and involve multiple nerves.<sup>3</sup> The plexiform neurofibroma is diffuse, overlying skin is hyperpigmented with hypertrichosis and has a bag of worms feeling on palpation.<sup>7</sup> It invades into the surrounding soft tissue and causes bony hypertrophy. The rapid growth occurs in a spurt during adolescence, with a period of relative inactivity in the adult.<sup>3</sup> The fifth,

ninth, and tenth cranial nerves are frequently involved.<sup>2</sup> The plexiform neurofibroma over face causes facial asymmetry and disfigurement.<sup>2,3</sup> There is potential for malignant transformation, and rapid growth along with persistent pain, which is an alarming sign.<sup>7</sup> The treatment of plexiform neurofibroma comprises surgical resection and symptomatic management. The surgical resection is difficult to perform due to invasion of tumor into the surrounding vital structures.<sup>4</sup> Till date, there is no medical treatment and due to substantial risk of malignancy in benign tumor, radiotherapy is contraindicated. Various drug targeting molecular pathways such as fibroblast inhibitors, antiangiogenesis drugs, and farnesyl transferase inhibitors, are under clinical trial for their potential therapeutic role.<sup>3,4</sup>

Bony abnormalities occur in about 40% of the patient.<sup>2</sup> Scoliosis occurs in 10% of the patient with NF.<sup>7</sup> Majority of the patients are diagnosed with scoliosis before 7 years of age.<sup>6</sup> It is linked to dysplastic bony changes and osteopenia. The treatment of scoliosis differs according to site, extent of deformity, age, and progression.<sup>7</sup>

## CONCLUSION

NF Type 1 is a multisystem autosomal dominant neurocutaneous disorder. Plexiform neurofibroma involves peripheral and cranial nerves. The treatment of plexiform neurofibroma comprises surgical resection and symptomatic management.

## ACKNOWLEDGMENTS

Nil

## PEER REVIEW

Nil

## CONFLICTS OF INTEREST

Nil

## FUNDING

Nil

## REFERENCES

1. Kudur MH, Hulmani M. Isolated plexiform neurofibroma over left palm: A case report and review of literature. *Indian J Dermatol* 2013;58:245.
2. Ghalayani P, Saberi Z, Sardari F. Neurofibromatosis type I (von Recklinghausen's disease): A family case report and literature review. *Dent Res J (Isfahan)* 2012;9:483-8.
3. Ferner RE, Huson SM, Thomas N, Moss C, Willshaw H, Evans DG, *et al.* Guidelines for the diagnosis and management of individuals with neurofibromatosis 1. *J Med Genet* 2007;44:81-8.
4. Staser K, Yang FC, Clapp DW. Pathogenesis of plexiform neurofibroma: Tumor-stromal/hematopoietic interactions in

- tumor progression. *Annu Rev Pathol* 2012;7:469-95.
5. Neurofibromatosis. Conference statement. National Institutes of Health Consensus Development Conference. *Arch Neurol* 1988;45:575-8.
  6. Durrani AA, Crawford AH, Choudhry SN, Saifuddin A, Morley TR. Modulation of spinal deformities in patients with neurofibromatosis type 1. *Spine (Phila Pa 1976)* 2000;25:69-75.
  7. Boyd KP, Korf BR, Theos A. Neurofibromatosis type 1. *J Am Acad Dermatol* 2009;61:1-16.

**How to cite this article:** Phuljhele S, Hura KS, Ramnani K, Khandwal O. Bilateral plexiform neurofibroma in neurofibromatosis Type 1: A case report and literature review. *Inter J Medical Sci Res Prac* 2015;2(2):107-109.

**Received:** 20 Jun 2015; **Accepted:** 22 Apr 2015; **Published:** 30 Jun 2015