International Journal of Research in Medical Sciences
Hirolikar RS et al. Int J Res Med Sci. 2023 Sep;11(9):3488-3491
www.msjonline.org
pISSN 2320-6071 | eISSN 2320-6012
DOI: https://dx.doi.org/10.18203/2320-6012.ijrms20232818

Case Report

A rare presentation of neurofibromatosis 2 as quadriparesis

Rushikesh S. Hirolikar*, Vishal B. Bokade, Amit Ganwani, Vinod Khandait

Department of Medicine, GMCH Nagpur, Maharashtra, India

Received: 15 March 2023
Accepted: 22 August 2023

***Correspondence:**
Dr. Rushikesh S. Hirolikar,
E-mail: Hirolikar@gmail.com

ABSTRACT

Neurofibromatosis (NF) is a complex genetic disorder primarily recognized for its characteristic tumors affecting the nervous system and skin. We present an exceptional case of a patient diagnosed with NF type 2, exhibiting an atypical clinical manifestation-quadriplegia. This case underscores the rarity of such a presentation, as NF typically presents with neurocutaneous features such as café-au-lait macules, neurofibromas, and meningiomas. Our patient, a 46-year-old male, presented with gradual onset quadriplegia without any preceding symptoms of NF. Radiological evaluation revealed meningiomas as well as extensive spinal neurofibromas compressing the spinal cord. This case exemplifies the importance of considering NF as a differential diagnosis in patients presenting with unexpected neurological deficits. Timely recognition and management of such cases are crucial for preventing irreversible neurological damage. This report adds to the growing body of knowledge regarding the diverse clinical presentations of NF and emphasizes the need for comprehensive assessment and multidisciplinary collaboration in managing this intricate disorder within the realm of medicine.

Keywords: Neurofibromatosis 2, Quadriplegia, Meningioma, Neurofibromas

INTRODUCTION

Neurofibromatosis type 2 is autosomal dominant syndrome that predisposes individuals to bilateral vestibular schwannomas. Multiple tumours such as meningiomas, ependymomas, schwannomas are present in brain as well as spinal cord.[3] Currently Manchester criteria is used for its diagnosis and is also adapted by international consensus group. Here we present a case of a 46-year-old female who presented with quadriparesis and was diagnosed as a case of neurofibromatosis type 2.

CASE REPORT

A 46-year-old female presented to the Tertiary care centre with bilateral lower limb weakness for 45 days, bilateral upper limb weakness for 25 days.

Lower limb weakness was more in proximal muscles than in distal muscles.

With passage of time upper limbs were involved in distal muscles more than in proximal muscles. Patient was able to feel the sensation of cloth on her body which later diminished

During this course, patient had no bowel and bladder incontinence. On asking leading questions, patient also gave history that, she has decreased hearing sensation in right ear in the last 1 year. Patient did not have band like sensation. Family history was not significant.

Table 1: Power across all large joints.

Power in joints	Right	Left
Shoulder joint	4/5	4/5
Elbow joint	4/5	4/5
Wrist joint	4/5	4/5
Hip joint	0/5	0/5
Knee joint	0/5	0/5
Ankle joint	3/5	0/5

On examination neurocutaneous markers were absent. On cranial nerve examination, right ear had mixed hearing loss with Rinne's positive in both ear and Weber lateralizing to left ear. There was visible wasting of both thenar and hypothenar muscles of both hands, spasticity present in both lower limbs. Power across all large joints is mentioned in Table 1.

Hand grip was weak in both hands. Deep tendon reflexes were exaggerated except for both triceps which were inverse and finger flexion was absent. Corneal reflex was present, abdominal reflex absent, and Beevor's sign negative. Babinsky sign positive and B/L ankle clonus present. Hoffman and Wartenberg reflex were also present. On sensory examination patient had hypoesthesia over both upper limb, lower limbs, trunk up to the level of shoulder C4 dermatomal level.

Based on history and clinical examination, extramedullary intradural compressive myelopathy was suspected.

Figure 1: Wasting of thenar and hypothenar muscles of left hand.

Figure 2: Wasting of hypothenar muscles of right hand

MRI brain+spine was done which showed well defined extra- axial altered signal intensity in right cerebello-pontine angle extending to involve 7^{th}-8^{th} cranial nerve complex causing widening and appearing isointense on T1WI, hyperintense on T2/STIR suggestive of vestibular schwannoma (Figure 4). Well defined extra-axial broad-based lesion in left parietal para-falcine region, appearing isointense on T1WI, T2WI and showing foci of blooming with heterogenous post contrast enhancement suggestive of Meningioma (Figure 3). Multiple intradural extramedullary well defined intensely and heterogeneously enhancing lesions seen in entire spine with largest seen at C6-C7 level (Figure 5) suggestive of neurofibroma, thereby abutting the right neural foramina and extending along C7 nerve root. At this level intramedullary subtle T2/STIR hyperintensity is also seen. Multiple such lesions seen at T7-T8 level, T9 level, T10-T11 level, T12-L1 level were also seen.

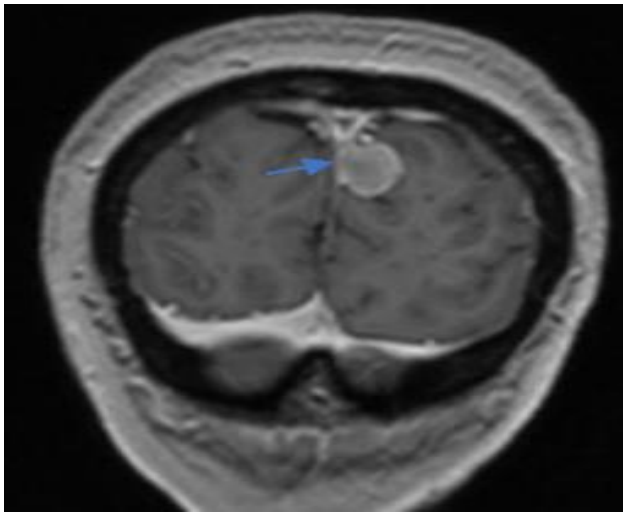

Figure 3: Meningioma in left parietal parafalcine region shown by arrow.

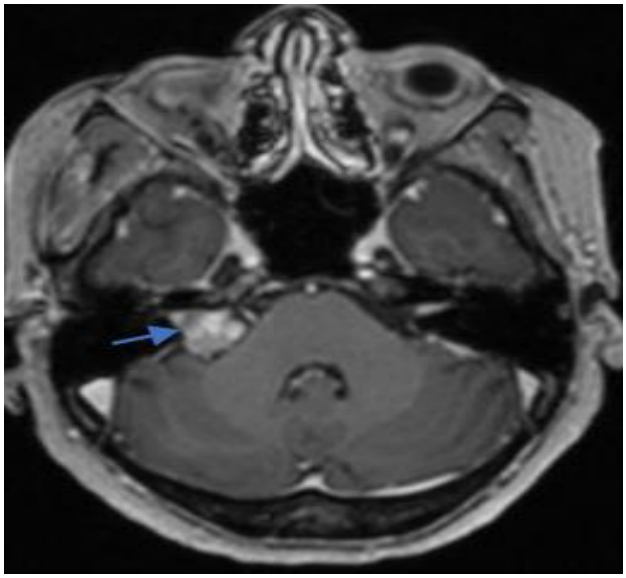

Figure 4: Right CP angle vestibular schwannoma.

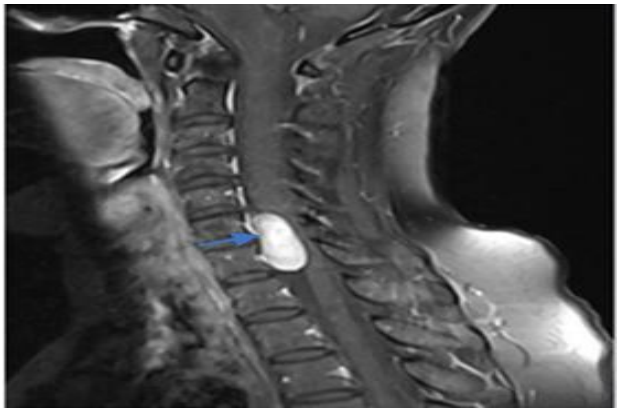

Figure 5: Hyperintensity seen at C6-C7 level suggestive of neurofibroma.

Patient underwent exploratory spinal surgery. A total of 6 tumours were removed around spinal cord on exploration (Figure 6). Masses were sent for histopathological examination. On histopathological examination, masses were suggestive of schwannomas with Antoni A and Antoni B areas (Figure 7) and magnified image also showing Verocay bodies (Figure 8) (Histopathology report in Figure 8). Meanwhile physiotherapy was started and patient regained complete power in lower limb. Patient was discharged and followed up in OPD.

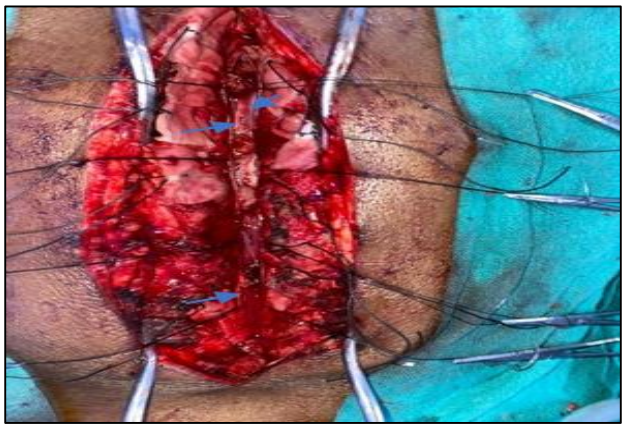

Figure 6: Intra-op picture showing multiple masses adjacent to the spinal card shown by arrow.

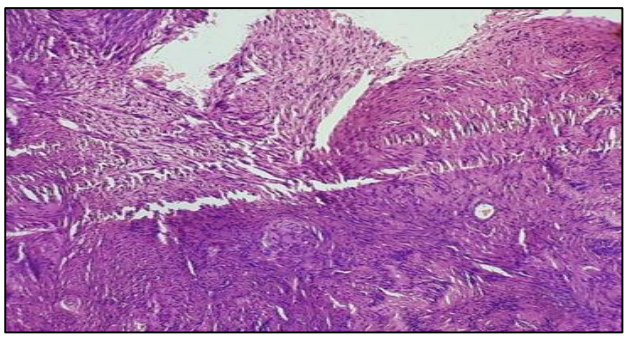

Figure 7: Original image of he10x showing hypercellular and hypocellular areas.[8,10]

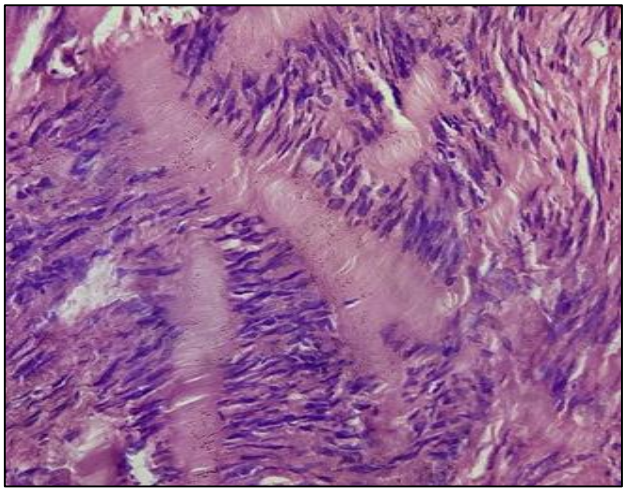

Figure 8: Original image he40x showing verocay bodies.[8,10]

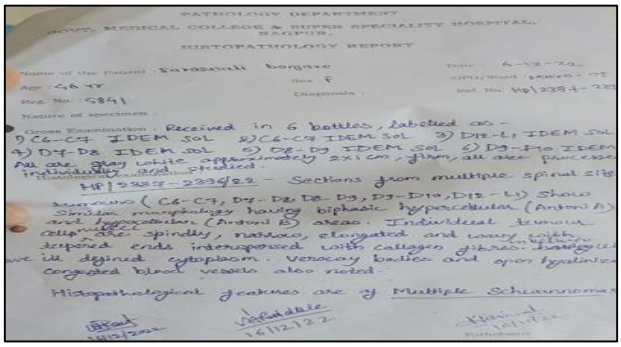

Figure 9: Histopathology report of the masses removed intra op.[8,10]

DISCUSSION

Compressive myelopathies are classified as extradural and intradural pathologies. Intradural could be congenital (cysts), infective (abscesses, granulomas) and tumours (benign/malignant). Extradural pathologies could be benign such that synovial cysts, osteomas, haemangiomas, etc. or malignant like bone metastasis, multiple myeloma, lymphoma. Intradural tumours can be further classified extramedullary like neurofibromas, meningiomas, lipomas, schwannomas, and arachnoid cysts and intramedullary could be astrocytoma, ependymomas, hemangioblastoma, and metastasis. Extramedullary tumours usually present with UMN type of paralysis, have asymmetrical weakness which progresses in an inverted U-shaped pattern and bowel bladder involvement. Intramedullary tumours present with LMN type of paralysis, with symmetrical descending paralysis with bowel and bladder involvement at presentation. Thus, our patient had features consistent with extramedullary tumours.

Neurofibromatosis type 2 is associated with abnormalities in NF2 gene located on chromosome 22. NF2 gene produces merlin/schwannomin, a tumour suppressor

protein.[1] Individuals with NF2 may inherit an abnormal allele form a parent or alternatively, a de novo variant may arise after fertilization, resulting in mosaic expression of 2 cell lines. A study of over 1000 patients with de-novo NF2 found that more than 50% of such cases are potentially due to mosaicism.[2]

Patients typically present around 20-25 years age.[3] In children, presentation is atypical and severe. However, in adults, hearing loss and tinnitus are presenting symptoms in over half of patients.[4] Neurological lesions seen are B/L vestibular schwannomas, intracranial meningiomas, spinal tumours (intramedullary/ extramedullary), peripheral neuropathy.[5,9] Eye lesions seen are posterior subcapsular cataract, epiretinal membranes.[6] Skin lesions include plaque like lesions, subcutaneous nodules.[7]

Diagnosis of neurofibromatosis type 2 is based upon characteristic clinical and molecular genetic features. Genetic testing is recommended in all patients with suspected schwannomata's predisposition syndromes, but is not required in diagnosis of NF2 in patients who fulfil clinical criteria (Table 2).

Table 2: Clinical criteria.

Primary finding	Added features needed for diagnosis
Bilateral vestibular schwannoma	None
First degree relative with NF2	Unilateral vestibular schwannoma or any two other NF2 associated lesions: Meningioma, schwannoma, ependymomas, juvenile cataracts
Unilateral vestibular schwannoma	Any two other NF2 associated lesions: meningioma, schwannoma, ependymomas, juvenile cataracts
Multiple meningiomas	Unilateral Vestibular schwannoma or any two other NF2 associated lesions: schwannoma, ependymomas, juvenile cataracts

CONCLUSION

This is a rare case of absence of family history of similar lesions and cutaneous markers. It is important to follow a structured clinical approach in localization of spinal space occupying lesions. Detailed clinical history, family history and examination are important to pick up soft markers of various diseases especially neurocutaneous syndromes.

Funding: No funding sources
Conflict of interest: None declared
Ethical approval: Not required

REFERENCES

1. Rouleau GA, Merei P, Lutchman M, Sanson M, Zucman J, Marineau C et al. Alteration in a new gene encoding a putative membrane organizing protein causes neuro-fibromatosis type 2. Nature. 1993;363(6429);515.
2. Evans DG. Incidence of mosaicism in 1055 de novo NF2 cases: much higher than previous estimates with high utility of next generation sequencing. Genet Med. 2020;22(1):53.
3. Forde C. Disease course of neurofibromatosis type 2: a 30 year followup study of 353 patients seen at a single institution. Neuro Oncol. 2021;23(7);1113.
4. Gaudioso C. Neurofibromatosis 2 in children presenting during the first decade of life. Neurology. 2019;93(10):e964.
5. Evans DG. A clinical study of type 2 neurofibromatosis. Q J Med. 1992;84(304):603.
6. Bosch MM. Ophthalmological findings and long term course in patients with neurofibromatosis type 2. Am J Ophthalmol. 2006;141(6):1068.
7. Mautner VF, Lindenau M, Baser ME, Kluwe L, Gottschalk J. Skin abnormalities in neurofibromatosis 2. Arch Dermatol. 1997;133(12):1539.
8. Sobel RA, Wang Y. Vestibular (acoustic) schwannomas: histologic features in neurofibromatosis 2 and in unilateral cases. J Neuropathol Exp Neurol. 1993;52:106-13.
9. Evans DG, Watson C, King A, Wallace AJ, Baser ME. Multiple meningiomas: differential involvement of the NF2 gene in children and adults. J Med Genet. 2005;42:45-8.
10. Antinheimo J, Haapasalo H, Haltia M. Proliferation potential and histological features in neurofibromatosis 2-associated and sporadic meningiomas. J Neurosurg. 1997;87:610-14.

Cite this article as: Hirolikar RS, Bokade VB, Ganwani A, Khandait V. A rare presentation of neurofibromatosis 2 as quadriparesis. Int J Res Med Sci 2023;11:3488-91.