Journal of Population Therapeutics & Clinical Pharmacology

RESEARCH ARTICLE
DOI: 10.53555/1k7c8920

A RARE CASE OF MEDIAN NERVE NEUROFIBROMA IN THE RIGHT ARM: ANATOMICAL CONFIRMATION FOLLOWING CADAVERIC DISSECTION.

Dr Archana Sinha[1], Dr Anant Kumar[2], Dr Sonali Kataria[3], Dr Vanita Gupta[4]

[1]Associate Professor, G S Medical College & Hospital, Hapur
[2]Assistant Professor, GS Medical College & Hospital, Hapur
[3]Assistant Professor, GS Medical College & Hospital, Hapur
[4]Professor & HOD, GS Medical College & Hospital, Hapur

Abstract

Background: Peripheral nerve sheath tumors (PNSTs) are uncommon lesions, among which Neurofibromas predominantly occur in association with Neurofibromatosis type 1. Solitary Neurofibromas involving major peripheral nerves are rare, and their occurrence in the arm is exceptionally uncommon. Median nerves Neurofibroma are more frequently reported in the wrist or forearm; involvement of the arm is sparsely documented.

Case Description: During routine cadaveric dissection of an adult upper limb, a fusiform swelling was identified along the course of the median nerve in the right arm. Detailed anatomical dissection revealed that the lesion was centrally located within the nerve, lacked a true capsule, and was inseparable from the nerve fascicles, while maintaining proximal and distal continuity of the median nerve. These features were consistent with a Neurofibroma.

Conclusion: This rare cadaveric finding emphasizes the importance of meticulous anatomical dissection in identifying and differentiating peripheral nerve sheath tumors. Awareness of such rare lesions is crucial for anatomists and surgeons to ensure accurate diagnosis and avoid in advertent nerve injury during surgical procedures.

Keywords: Median nerve, Neurofibroma, Cadaveric dissection, Peripheral nerve sheath tumor, Arm

Introduction

Peripheral nerve sheath tumors (PNSTs) represent a diverse group of benign and malignant neoplasm arising from the supportive tissues of peripheral nerves. These tumors originate from Schwann cells, perineurial cells, fibroblasts, or a combination of these cellular elements. Among benign PNSTs, Schwannomas and Neurofibromas account for the majority of cases[1]. Neurofibromas are benign, slow-growing tumors that are most commonly associated with Neurofibromatosis type 1 (NF1), an autosomal dominant disorder characterized by multiple Neurofibromas, café-au-lait spots, axillary freckling, and Lisch nodules. However, solitary Neurofibromas occurring independently of NF1 are relatively rare and may arise from small cutaneous nerves or, less commonly, from major peripheral nerves [2].The median nerve, one of the principal nerves of the upper limb, is most frequently involved by compressive neuropathies such as carpal tunnel syndrome. Tumors involving the median nerve are uncommon, and when present, they

are usually located in the wrist or forearm. Neurofibromas of the median nerve in the arm (brachium) are exceptionally rare and are seldom reported in anatomical or clinical literature [3]. From a pathological and surgical standpoint, Neurofibromas differ significantly from Schwannomas. Schwannomas are typically well- encapsulated and eccentrically placed, allowing for relatively safe surgical excision. In contrast, Neurofibromas are non-encapsulated, centrally located, and infiltrate the nerve fascicles, making complete excision challenging and increasing the risk of postoperative neurological deficits [4].

Cadaveric dissection remains a cornerstone of anatomical education and continues to provide invaluable insights into rare anatomical variations and pathological conditions that may not always be encountered clinically. The present report describes a rare case of median nerve Neurofibroma in the right arm, identified and confirmed through meticulous cadaveric dissection.

Case Report (Cadaveric Observation)

During routine educational dissection of the right upper limb in the Department of Anatomy, GS Medical College & Hospital (Hapur) an unusual finding was observed in an adult human male cadaver of 65 years of age.

Gross Anatomical Findings

On exposing the flexor compartment of the right arm, the median nerve was identified along its normal anatomical course. A fusiform swelling was noted involving the median nerve in the middle third of the right arm, on its medial aspect.

The swelling measured approximately **[length 6cm × height 4.5cm × width 2.5 cm]**and resulted in a localized enlargement of the nerve. The proximal and distal segments of the median nerve appeared normal in caliber and continuity.

Detailed Dissection Findings

Careful and systematic dissection revealed that:

- The lesion was intrinsic to the median nerve, involving the nerve substance itself.
- There was no distinct capsule separating the lesion from the nerve fascicles.
- Individual nerve fascicles were observed to pass through the lesion, making separation difficult.
- The tumor caused fusiform expansion rather than eccentric displacement of the nerve.
- Surrounding anatomical structures, including the brachial artery, venaecomitantes, and adjacent muscles, were intact and uninvolved.

No additional nerve swellings or abnormalities suggestive of generalized neurofibromatosis were identified elsewhere in the dissected limb.

Figure1: Cadaveric dissection of the right arm demonstrating a fusiform enlargement of the median nerve.

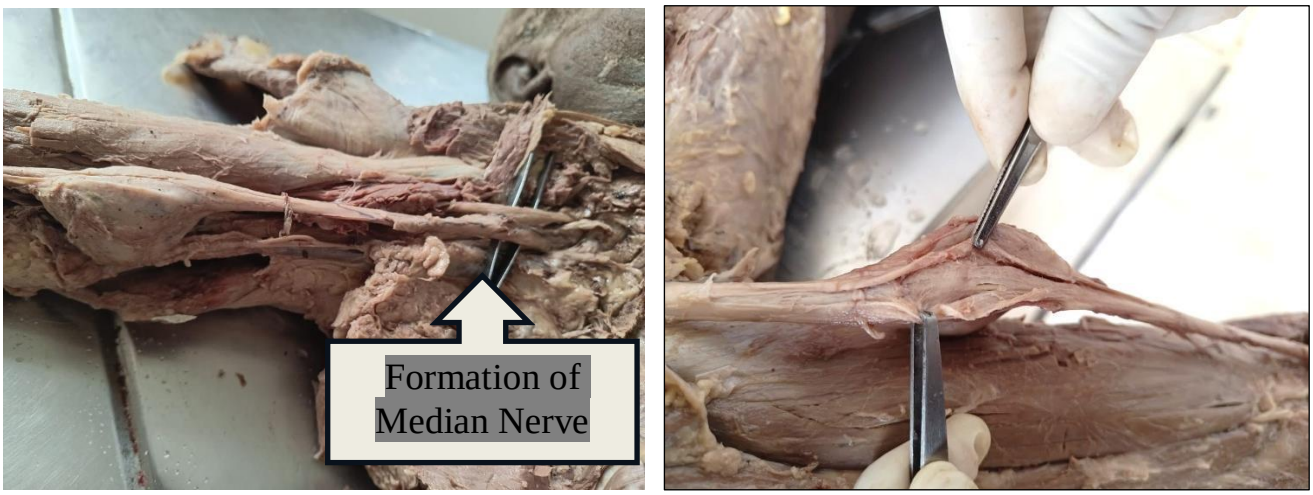

Figure 2: The lesion is centrally located, non-encapsulated, and inseparable from the nerve fascicles, confirming a Neurofibroma.

Diagnosis

Based on the characteristic anatomical features observed during dissection—central intraneural location, absence of encapsulation, fascicular involvement, and fusiform enlargement—the lesion was diagnosed as a **solitary Neurofibroma of the right median nerve**.

Discussion

Neurofibromas are benign PNSTs composed of a mixture of Schwann cells, fibroblasts, mast cells, and perineurial-like cells embedded in a myxoid stroma. Their infiltrative growth pattern distinguishes them from Schwannomas and has important clinical implications [5].

Median nerve Neurofibromas are rare, and most reported cases are identified clinically due to compressive neuropathic symptoms or incidentally during imaging or surgery. Reports of such tumors identified during **cadaveric dissection**, particularly in the arm, are exceedingly uncommon.

The present case demonstrates several classical features of Neurofibroma:-

1. **Central intraneural growth**
2. **Lack of a true capsule**
3. **Involvement of multiple nerve fascicles**
4. **Fusiform enlargement of the nerve**

These features contrast with Schwannomas, which are usually encapsulated and eccentrically located, allowing displacement rather than infiltration of nerve fascicles [6].

From a surgical perspective, recognition of Neurofibroma is critical, as attempts at complete excision may result in significant neurological deficits. From an anatomical perspective, this case highlights the value of cadaveric dissection in demonstrating pathological processes and enhancing understanding of nerve pathology. Similarly, Intratemporal facial Neurofibroma case arising mainly from mastoid segment in 17-year-old female was presented with progressive facial palsy for 3 years was reported [7]. CT or MRI imaging for remodeling or growth of bony landmarks connected in the course of the affected nerve(s). While Schwannoma and Neurofibroma share lots of imaging characteristics, and thus can be difficult to differentiate

on imaging [8]. A 45-year old female among segmental NF1 of the right upper limb was referred for pain and ulnar paresthesias also discussed [9].

Embryological and Pathological Considerations

Neurofibromas arise from aberrant proliferation of neural crest–derived cells. The infiltrative growth pattern reflects their origin from multiple cellular components of the nerve. Solitary Neurofibromas are believed to arise sporadically, without the genetic alterations seen in NF1-associated lesions [10].

Clinical and Surgical Significance

- Surgeons operating in the arm must consider intraneural tumors in cases of unexplained nerve enlargement.
- Differentiation between Schwannoma and Neurofibroma is essential for surgical planning.
- Anatomical knowledge of such rare lesions helps prevent iatrogenic nerve injury.
- Cadaveric findings contribute valuable baseline data for correlating clinical and radiological observations.

Conclusion

Solitary Neurofibroma of the median nerve in the arm is an extremely rare entity. Cadaveric dissection provides definitive anatomical confirmation and enhances understanding of the morphological characteristics of such tumors. Awareness of these rare lesions is essential for anatomists, surgeons, and clinicians' involved in the management of peripheral nerve disorders.

Ethical Statement

The study was conducted on a legally donated human cadaver used for teaching and research in accordance with institutional ethical guidelines. No identifying information was included.

Conflict of Interest

The authors declare no conflict of interest.

References

1. Skovronsky DM, Oberholtzer JC. Pathologic classification of peripheral nerve tumors. Neurosurg Clin N Am. 2004; 15:157–166.
2. Friedman JM. Neurofibromatosis 1. GeneReviews®. 2019.
3. Reynolds DL, Jacobson JA, Inampudi P, et al. Sonographic characteristics of peripheral nerve sheath tumors. AJR Am J Roentgenol. 2004; 182:741–744.
4. Kim DH, Murovic JA, Tiel RL, et al. A series of 397 peripheral nerve sheath tumors. Neurosurgery. 2005; 56:1226–1233.
5. Weiss SW, Goldblum JR. Enzinger and Weiss's Soft Tissue Tumors. 6th ed. Elsevier; 2014.
6. Pilavaki M, Chourmouzi D, Kiziridou A, et al. Imaging of peripheral nerve sheath tumors with pathologic correlation. Eur J Radiol. 2004; 52:229–239.
7. H. Vijayendra, Amro Yousef, Vinay Kumar Vijayendra, Nilesh Mahajan,Intratemporal facial nerve neurofibroma: a case report and review of literature,Vol. 9 No. 6 (2023): June 2023.
8. Ferro J, Sozio SJ, Li L, Roychowdhury S, Sundararajan SH. 2023. Trigeminal Nerve Neurofibroma Presenting as Facial Swelling in Two 3-year-olds. J Med Imaging Case Rep 7(2): 55-60.
9. Garozzo, Debora,Peripheral nerve tumors in neurofibromatosis 1, An overview on management and indications for surgical treatment in our experience. Neurology India 67(Suppl 1):S38-S44, Jan–Feb 2019.

10. Ferner RE. Neurofibromatosis 1 and neurofibromatosis 2: a twenty-first century perspective. Lancet Neurol. 2007; 6:340–351.