

A Giant Lipoma in the Distal Forearm of a Cadaver

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Received: 21 December 2022; **Accepted:** 26 March 2023

Abstract

Objective. Lipomas are very common tumors which usually prefer the upper limbs and, depending on their size, may cause nerve compression, or may be asymptomatic. The current cadaveric report describes a giant lipoma in the distal forearm area. **Case Report.** A large mass (5.1 × 3.2 × 1.6 cm) was identified on the palmar surface of the distal forearm, during dissection of a 63-year-old male cadaver. The mass caused anteromedial displacement and flattening of the median nerve (MN). Despite the lack of information about the subject's medical history, MN compression was assumed on the basis of the lipoma's size, its vicinity to neural structures, and the MN displacement and flattening. **Conclusion.** The enlarged distal forearm lipoma, located adjacent to the carpal tunnel, displaced and flattened the MN. The cadaveric finding described is clinically relevant for both differential diagnosis and surgical treatment of carpal tunnel syndrome.

Key Words: Distal Forearm ■ Giant Lipoma ■ Tendon Sheath ■ Carpal Tunnel Syndrome.

Introduction

Lipomas, the most common tumors, often present as gradually increasing, soft and resilient non-tender masses (1). They typically appear in the fifth or sixth decade of life (2). When their size exceeds 5 cm, they are considered to be giant (3). Lipomas rarely cause symptomatic nerve compression (4, 5). Only a few cases of distal forearm-carpal lipomas have been described (1, 5-8), with some of them being completely asymptomatic (1), and others, especially the enlarged ones, causing carpal tunnel syndrome (CTS)-like symptoms (5). The prevalence of forearm-carpal lipomas varies, remaining in quite low percentages compared to lipomas in other upper limb locations (9-11).

The current cadaveric report presents an unusual giant lipoma on the palmar surface of the

distal forearm, which originated from the flexor pollicis longus tendon sheath, and displaced and flattened the median nerve (MN).

Case Presentation

During a routine dissection of a 63-year-old male cadaver of Greek origin, a large mass was identified on the palmar surface of the left sided distal forearm. The ovoidal tumor mass measured 5.1 cm × 3.2 cm × 1.6 cm and was located between the flexor hand muscles (flexor carpi radialis and flexor digitorum superficialis), posterior to the MN, and anterior to the pronator quadratus muscle. Due to the mass, the MN was anteromedially displaced and was characteristically flattened (Figure 1). Following excision of the mass, the MN was released and the pronator quadratus muscle revealed. The mass was carefully inspected

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and characterized as a lipoma (Figure 2). No details were available in the donor's medical records related to possible clinical manifestations due to

CTS during the subject's life. Furthermore, no obvious hand muscle atrophy, nor any scar indicative of prior carpal tunnel (CT) release was found.

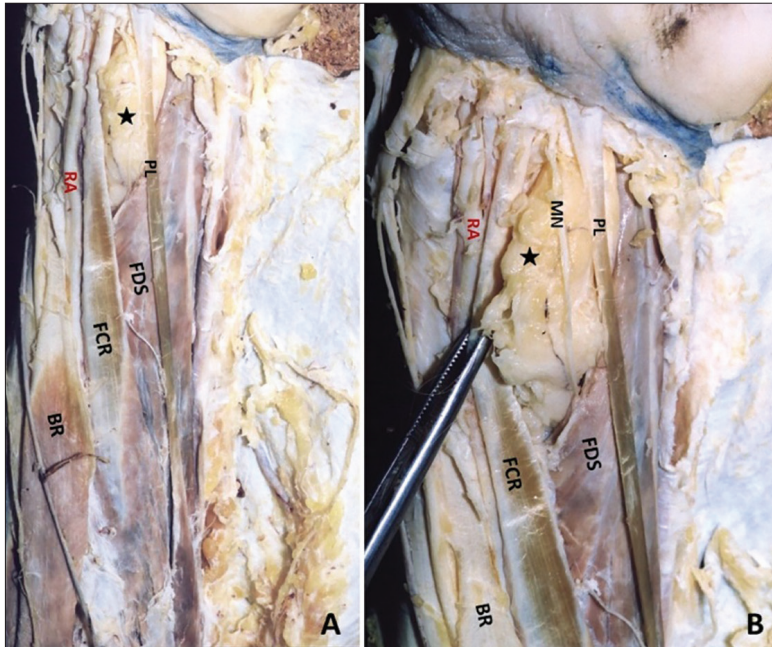


Figure 1 A and B. The tumor mass (black asterisk) located posterior to the palmaris longus (PL) muscle, between the muscles, flexor carpi radialis (FCR) and flexor digitorum superficialis (FDS), RA-radial artery, BR-brachioradialis muscle, and MN-median nerve.

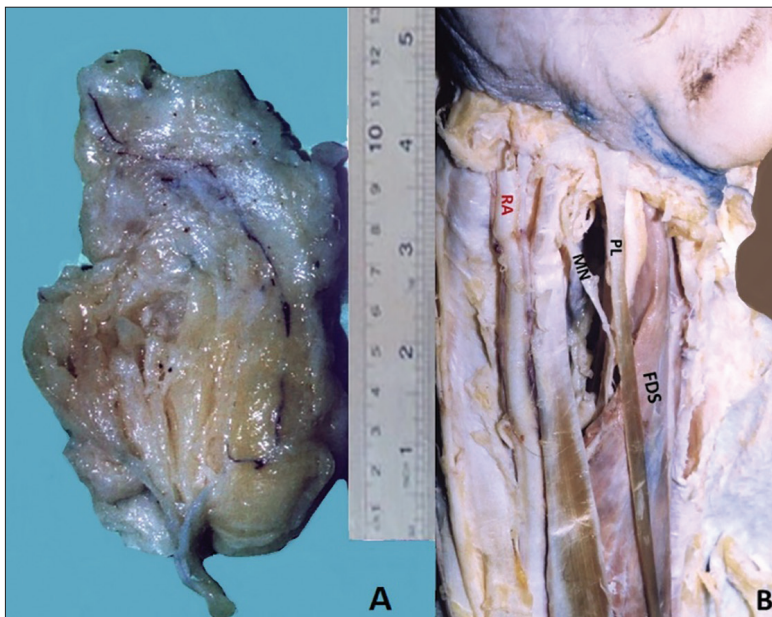


Figure 2 A. The giant lipoma after excision; B. The carpal area free of the tumor.

Discussion

The current case is considered a synovial-related lipoma, further sub-classified as a tendon sheath lipoma. Although there were no clinical details available, the enlarged size of the lipoma (giant) provoked the MN anteromedial displacement and its flattening. Other types are: dermal, subcutaneous, subfascial, muscle-, bone- and nerve- related lipomas (12). Giant lipomas (≥ 5 cm) should be considered as malignant until proven otherwise (3). Lipomas are usually benign tumors and occur in approximately 2% of the population (3). Their prevalence in the forearm-carpal-palmar area is variable. Distal forearm lipomas have a variable prevalence. Yavari et al. (10) recorded a prevalence of 27.2% (3 cases out of 11 upper limb lipomas) and Elbardouni et al. (11), a prevalence of 7.7% (1 case out of 13 upper limb lipomas). Barrile (9) identified a quite low prevalence (0.21%) of palmar lipomas (1 case out of 476 upper limb lipomas).

Clinical Implications

Patients with asymptomatic lipomas show a characteristic delay in seeking medical attention (3), and as a result a significant increase in the lipoma's dimensions may occur over time (1). The first symptoms that commonly alert patients are caused by nerve compression

by the mass. In the distal forearm, the lipoma may mimic CTS. Usually the MN is compressed, and the relevant symptoms include difficulty in grasping, decreased finger flexion, finger numbness and tingling, as well as power loss in MN distribution (13, 14). In 1964, Morley (6) described a carpal lipoma that was painless but with discomfort and tingling in the fingers when pressure was applied. The same symptoms were described in a giant carpal lipoma (1). Recent clinical reports refer to patients with finger numbness and swelling of the carpal area, as well as loss of muscle power in MN distribution (3, 13, 14). In addition to lipomas, entrapment neuropathy may be caused following the trans-muscular course of a MN branch in the forearm, with symptoms resembling CTS (15). Other anatomical factors causing CTS include accessory and variant muscles (elongated bellies or tendons of distal flexor muscles) in the distal forearm area, a bifid MN that may be compressed along its course, and the presence of a persistent median artery (16–18).

Surgeons, neurologists, and general practitioners should be alert to early identification of lipomas, as delayed diagnosis, particularly in cases of tumors located on the palmar surface of the distal forearm, may cause complications due to nerve compression, as well as significant disturbance in patient's life quality. Surgical excision may completely relieve symptoms (3, 5, 8, 13). Intraoperatively, surgeons should be alert for lipomas in close proximity to muscle tendons and neurovascular structures (1). In cases of recurrence, despite the transverse carpal ligament release, magnetic resonance imaging (MRI) is recommended, to investigate any aberrant soft tissue compressing the MN, within or adjacent to the CT. In such cases, imaging via MRI scan is optimal for preoperative planning (1).

Conclusions

The current cadaveric report highlights an enlarged distal forearm lipoma, situated adjacent to the CT, displacing, and flattening the MN. The finding is clinically relevant both for CTS

differential diagnosis and surgical treatment. Any case of persistent CTS that is unresponsive to treatment should alert physicians to possible nerve compression attributed to a mass.

What Is Already Known on This Topic:

Lipomas are very common tumors that are considered giant when they exceed 5 cm. They are usually benign, and occur in about 2% of the population. Their prevalence in the forearm-carpal area varies, remaining in quite low percentages compared to lipomas in other upper limb locations. Distal forearm or carpal lipomas have been found to cause carpal tunnel-like symptoms, caused by median nerve compression. Specifically, they can cause tingling, numbness, loss of power, grasping difficulties, and decreased finger flexion. Usually, delayed diagnosis causes significant disturbance of the patient's life quality. Other anatomical factors causing carpal tunnel syndrome include accessory and variant muscles in the distal forearm area, a bifid median nerve that may be compressed along its course, and the presence of a persistent median artery.

What This Study Adds:

The current cadaveric report presents a large mass identified on the palmar surface of the distal forearm in a 63-year-old male cadaver. The mass caused the anteromedial dislocation of the median nerve and its characteristic flattening. Despite the lack of information on the subject's medical history, the lipoma's size and its vicinity to neural structures obviously caused nerve compression. The described finding is clinically relevant for both differential diagnosis and carpal tunnel syndrome surgical treatment.

Acknowledgments: The authors are grateful to the body donor and his family for their contribution to anatomy education and research.

Authors' Contributions: KN undertook the dissection of the cadaver and captured the case; VA and MP performed the acquisition, data analysis, and interpretation, and wrote the paper; TT revised the paper. All authors approved the final form of the draft paper.

Conflict of Interest: The authors declare that they have no conflict of interest.

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