Angiolipomas are benign fatty tumors with a hemangiomatous component. This diagnosis was first described and differentiated from lipomas by Howard et al.1 in 1960, as they noted an increased density of vasculature seen within the encapsulated tumor.2 Angiolipomas account for approximately 5% to 17% of all lipomas, and despite the forearm being a common location for angiolipomas, those in the hand and digit are rare presentations.3,4 In 1985, Walling et al.5 described 3 cases of angiolipomas involving the wrist and hand to highlight the pathologic differences between infiltrating and noninfiltrating types. Classically, infiltrating angiolipomas are found in deeper layers of the lower extremities without encapsulation and tend to invade local soft tissues. These will recur with surgical excision, in contrast to the noninfiltrating types that do not recur with marginal excision.2,6 A recent case report by Karaali et al.7 described a noninfiltrating angiolipoma involving the index finger, shedding light on its rare presentation, citing only one other case involving a digit.4 In this case report, we present a case involving a 64-year-old man with a large palmar noninfiltrating angiolipoma as a cause of carpal tunnel syndrome. Written informed consent was obtained from the patient for publication of this case report and the accompanying images.

### Case Report

A 64-year-old otherwise healthy right-hand dominant man presented with the complaint of 2 palmar masses present on his left hand with accompanied median nerve numbness and left-hand pain. The patient was uncertain about when he first noticed the hand mass, but it increased in size over the last several months. His physical examination revealed a 5 cm × 3 cm soft, nontender mass in the thumb web space and thenar eminence and a 3 cm × 2.5 cm soft, nontender mass between his ring finger and small finger. Figure 1 depicts the affected hand compared with the contralateral normal hand. By examination, it was difficult to elucidate whether the masses were connected, but there was high suspicion based on his carpal tunnel symptoms. The patient complained of numbness involving his thumb and index finger, but he denied nighttime symptoms. He had a negative Tinel test at the wrist but a positive Phalen test.

His radiographs did not reveal any bony involvement, but the soft tissue masses could be appreciated, as seen in Figure 2. Magnetic resonance imaging (MRI) revealed a fat-containing, lobulated lesion measuring 8.2 cm × 6.7 cm × 2.8 cm enveloping the carpal tunnel tendons and flexor tendons distal to the carpal tunnel (Fig. 3). It was hyperintense in the T1 sequence and hypointense in the T2 sequence. The MRI interpretation suggested that the mass was one large fat-containing lesion. Because the mass was symptomatic and a decision to perform a surgical excision was already made, an electromyogram was deferred, and a carpal tunnel release was planned at the time of surgery.

The patient was taken to the operating room for a left carpal tunnel release and excision of the mass. The left hand was prepared...
and draped in the usual sterile fashion. A tourniquet was applied, and an Esmarch bandage was used to exsanguinate the left limb. A parathenar incision was planned and marked, which was extended radially to the thumb web. A transverse incision was planned and marked at the distal palmar crease, which was extended to the base of the small finger. For the carpal tunnel release, the proximal incision was used, and the superficial palmar fascia was cut longitudinally. The transverse carpal ligament was sharply incised and just distal to the carpal tunnel, and the enlarged mass was identified. It displaced the digital nerve and the median and ulnar nerves superficially. The nerves were carefully dissected from proximal to distal, and the superficial palmar arch, the ulnar artery, and tributaries distally into the digital arteries. Initially, the focus was centered on the section of mass in the hypothenar space. The mass was well encapsulated, and it was noted to be adherent to the flexor tendons, the interosseous muscles, and the lumbricals. Hemostasis was achieved with bipolar cautery. The mass was reflected distally, and the radial side was noted to go into the thumb web. The

**Figure 1.** The affected left hand revealed a 5 cm × 3 cm mass in the thumb web space and thenar eminence and a 3 cm × 2.5 cm mass between his ring finger and small finger, a noticeable difference in size compared with the unaffected contralateral hand.

**Figure 2.** Radiographs of the left hand reveal a large soft tissue mass most noticeably around the thenar eminence.

**Figure 3.** Axial sections of T1 weighted and T2 weighted MRI revealing the soft tissue mass enveloping the flexor tendons in the left hand.
mass was truncated along its most radial surface before its extension into the thumb web, and it was excised and sent to pathology.

Next, the palmar incision was extended to the thumb web transversely. Careful dissection followed, and hemostasis was again achieved with bipolar cautery. The digital vessels on the radial side of the hand and the thumb were identified and dissected free from the surrounding tissue and mass. The remaining half of the mass was well encapsulated and carefully dissected off the lumbrical of the index finger and the flexor tendon sheath of the thumb. It was excised and sent to pathology. At this point, the tourniquet was deflated, and hemostasis was secured with bipolar cautery. The wound was irrigated, and the incisions were closed with nylon sutures. Figure 4 depicts the surgical incisions made during the case.

At the conclusion of the case, a surgical drain was placed with plans to remove it in the office one day after surgery.

The gross surgical pathology was a 7.5 cm × 6 cm × 2.5 cm aggregate of nodular portions of lobulated, tan-yellow adipose tissue encapsulated by a thin, translucent fibro membrane, as seen in Figure 5. Sectioning revealed soft to rubbery, tan-yellow cut surfaces. Histology revealed mature adipose tissue with numerous vascular structures.

Ten days after surgery, the sutures were removed, and the patient confirmed that his median nerve symptoms and hand pain had resolved. He endorsed numbness to the ulnar border of his ring finger, correlating with the findings of the mass enveloping the digital nerves and arteries. These symptoms resolved by his next visit. No recurrence of the mass or carpal tunnel symptoms have been seen at his 2-month follow-up.

Discussion

Masses of the hand are common; however, angiolipomas of the hand and digits are rare, with only a few case reports found in the English literature.1,2,3,7 Lipomas of the hand are much more frequent, but a distinct pathology exists between the two entities. Clinically, angiolipomas can be painful and, on average, appear larger than lipomas. Both characteristics are attributable to the increased vasculature. Chow8 presented an unusual soft tissue tumor of the hand in a 40-year-old man involving an “infiltrating hybrid mesenchymal tumor of skeletal muscle showing lipomatous, hemangiomatous, leiomyomatous, and osseous features” after initial ultrasound-guided biopsy suggesting an infiltrative angiolipoma of the skeletal muscle. The case highlights the importance of complete biopsy, as some minimally invasive techniques may lead to misdiagnosis.

This case is the first report of an angiolipoma as a cause of carpal tunnel syndrome. Barreira et al9 described the recurrence of carpal tunnel syndrome in a patient because of a giant lipoma that developed in the hand within 6 months of the primary surgery. Also, Chen et al10 retrospectively reviewed space-occupying lesions as a cause for carpal tunnel syndrome and noted only 3 lipomas as a cause in 779 patients who underwent the procedure. Although clinically, lipomas and angiolipomas are similar, the fact that angiolipomas can be infiltrating or noninfiltrating can affect the outcomes and treatment strategies. As Walling et al5 described, noninfiltrating angiolipomas of the hand may be managed by marginal excision without the risk of recurrence. However, infiltrating types need a wider margin because they tend to recur. Obtaining this margin in the hand is difficult, because of the proximity of neurovascular structures.5 For infiltrating types in the hand, these authors do not suggest risking those structures to obtain a wide tissue margin. However, it becomes imperative to discuss the risk of recurrence with patients and establish appropriate expectations.

For masses of the hand, biopsy and surgical excision remain the gold standard after completing the appropriate workup. In cases in which the lesion is determined and considered benign, surgical excision before a biopsy is appropriate. Often, an MRI helps delineate these lesions. In our case, MRI confirmed that the mass was a fatty tumor, and surgical excision led to the definitive diagnosis. As stated before, infiltrating angiolipomas are more concerning because of their recurrence risk. However, despite the noninfiltrating nature of some angiolipomas, their large size alone can create a mass effect in areas such as the hand and wrist and become symptomatic, as was the presentation in this case. With surgical excision, all symptoms were treated leading to a successful outcome.

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