

Demographic Characteristics, Anatomical Distribution, and Clinical Presentations of Lipomatosis Tumors Arising from Hand and Wrist

Adviye Ergun¹ Aslan Akin² Mehmet Sukru Sahin³ Ali Kitis⁴

¹Department of Physical Therapy and Rehabilitation, Alanya Teaching and Medical Research Center, Baskent University, Alanya, Turkey

²Department of Radiology, Konya Training and Research Hospital, Konya, Turkey

³Department of Orthopaedics and Traumatology, Alanya Teaching and Medical Research Center, Baskent University, Alanya, Turkey

⁴Department of Physical Therapy and Rehabilitation, Pamukkale University, Denizli, Turkey

Address for correspondence Adviye Ergun, DPT, Fizik tedavi ve Rehabilitasyon Bölümü, Alanya Hastanesi, Baskent Üniversitesi, 07400 Alanya, Antalya, Turkey (e-mail: adviyesalman@yahoo.com).

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Abstract

The aim of this study is to analyze demographic characteristics, anatomical distribution, and clinic presentations of the lipomatosis masses in hand and wrist. The hand and wrist magnetic resonance (MR) images of 2,453 patients were evaluated retrospectively. Nineteen cases were included in the study that is seen fat component in mass in MR images. Patients' age, sex, and clinical symptoms were noted. The size and the localization area of the mass were evaluated. Ordinary lipomas were detected in 18 (95%) patients, and fibrolipomatous hamartoma of the median nerve was detected in 1 patient (5%). Benign ordinary lipomas were most frequently observed in palmar and ventral sides. Lipomas located in palmar area tend to be bigger size comparing with other locations. Deep-seated lipoma is localized in central area frequently. In ordinary lipoma cases, patients are generally (78%) asymptomatic. The most frequent clinical symptom is limitation in movement depending on mass dimension.

Keywords

- ▶ adipose tissue/pathology
- ▶ diagnosis
- ▶ differential
- ▶ hand/pathology
- ▶ lipoma/pathology
- ▶ magnetic resonance imaging

Introduction

Lipomatosis tumors arising from hand and wrist are relatively rare. Demographic characteristics, anatomical distribution, and clinical presentations have not been investigated/dwell enough because of the rarity of these tumors.

Lipomatous masses in hands were presented before as case reports in the literature.^{1–3} However, there is limited number of available publications reporting presentation diversity of the lipomatosis mass in hand.⁴ Localized ordinary lipoma diagnosis in hand, its complications, and treatment have been evaluated in the case series performed by Nadar et al.⁴

The aim of this study is to analyze demographic characteristics, anatomical distribution, and clinic presentations of the lipomatosis masses in hand and wrist.

Materials and Methods

The magnetic resonance (MR) images of 2,453 patients between 2000 and 2016 with a prediagnosis of pain and mass in hand and wrist were evaluated retrospectively. Nineteen cases were included in the study that is seen fat component in mass in MR images (with high signal observed in both sequences and homogeneously suppressed in images with fat suppression). Diagnosis was determined with characteristic MR imaging (MRI) specifications only in 13 of these patients. In the remaining six patients in addition to MRI, histopathological examination was carried. This study was approved by the hospital's ethics committee. A signed consent from the patients was not necessary.

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Patients' clinical symptoms were noted. The size and the localization area of the mass were evaluated in all patients' MR images.

All examinations were performed with the devices, 1-T MR (Signa imager, GE Healthcare, Milwaukee, Wisconsin, United States) and 1.5-T MR (Brivo 355 inspire, GE Healthcare, Milwaukee, Wisconsin, United States). The fields of view varied from 80 to 160 mm. The slice thickness varied from 2 to 5 mm and the slice gap varied from 0.5 to 2.5 cm. Matrices of 256×128 – 256 were used. Axial and either sagittal or coronal images, or both, were obtained for all lesions. T1-weighted spin-echo sequence (350–500/14–30: repetition time/echo time [TR/TE], ms), T2-weighted spin-echo or fast spin-echo sequence (2,000–4,000/80–120), T1-weighted gradient-echo sequence (25/4.6 [TR/TE]), T2-weighted gradient-echo imaging (26–500/15–20), and fast short tau inversion recovery (STIR) sequence (4,000–4,500/30–60, inversion time: 90–150 ms) were obtained. All measurements were performed electronically. Each measurement was repeated twice, and the average was taken to minimize random errors.

Localization area was divided into two: in the right hand and in the left hand. Localization in hand was classified in two groups: ventral and dorsal. In addition, localization of the mass was divided into two zones: superficial and deep (tendons, muscles, or extension into bones). As mentioned by Fletcher and Martin-Bates, mass was coherent with superficial lesion if it was localized in subcutaneous fat tissue; it was coherent with deep extended lesion if localized under fascia.⁵ Localization in hand is divided into three groups, such as in wrist, palmar area, and fingers. Palmar area is divided into two subgroups: localized ventral and dorsal. In addition, the ventral area is divided into three subareas, such as hypothenar, thenar, and central localized.

Hypothenar area is considered as localization where hypothenar muscles are, the muscles of the thenar are considered as thenar area, and the central area is considered to be the location where the lumbrical and interosseous

muscles are. The size of the mass was calculated as the average of the three longest dimensions of masses.

The average and standard deviations were calculated for each measurement. Differences between groups were compared using the Mann–Whitney *U* test. A *p*-value of less than 0.05 was considered statistically significant. Statistical analysis was performed using SPSS 17.0 software (SPSS Inc., Chicago, IL).

Results

Ordinary lipomas were detected in 18 (95%) patients, and fibrolipomatous hamartoma of the median nerve was detected in 1 patient (5%) (►Fig. 1).

Benign ordinary lipoma was the most common (95%) lipomatosis mass observed in hand and wrist. Eleven patients were female and 7 were male. Their age was between 34 and 83 years; the average age of the patients was 60.2 ± 10.4 years. Mass was observed mostly in the left hand (11 patients were left side and 7 were right side).

Lipoma in palmar area ($n = 14$) was most common than wrist ($n = 2$) and finger ($n = 2$) (►Figs. 2–4). The presence of palmar lipoma was statistically significant while compared with other localizations ($p = 0.017$ and $p = 0.017$, respectively).

Palmar lipoma was located in ventral side in 12 patients and in dorsal side in 2 patients (►Fig. 5). Lipoma frequency in ventral area showed statistically significant difference than lipoma in dorsal area ($p = 0.02$).

In eight of the lipomas located in ventral side were in central area, three of them were in hypothenar area and one of them was in thenar area. However, there was not significant statistical difference between them.

Lipoma was superficial located in 16 patients and deep seated in 2 patients (►Fig. 2). Lipoma frequency of superficial localized were showing statistically significant difference comparing with deep-seated lipoma existence ($p = 0,013$). All of the deep-seated lipomas were in the palmar area, ventral side, and located centrally. In both cases, lipoma was intermuscular lipoma.

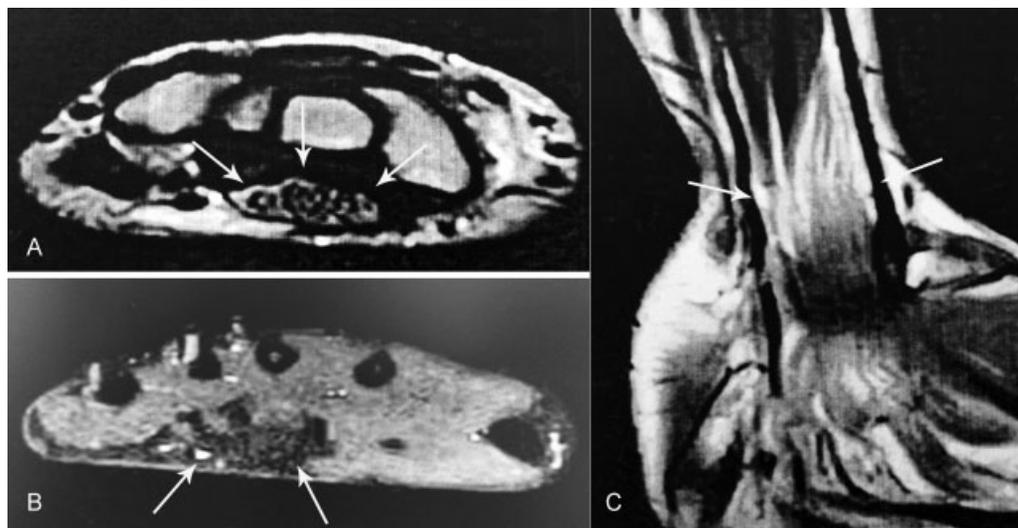


Fig. 1 Fibrolipomatous hamartoma of the median nerve. (A) Axial T1-weighted, (B) axial fat-suppressed T2-weighted, and (C) coronal T1-weighted images show marked thickening of the median nerve with adipose tissue surrounding the nerve fascicles (arrows).

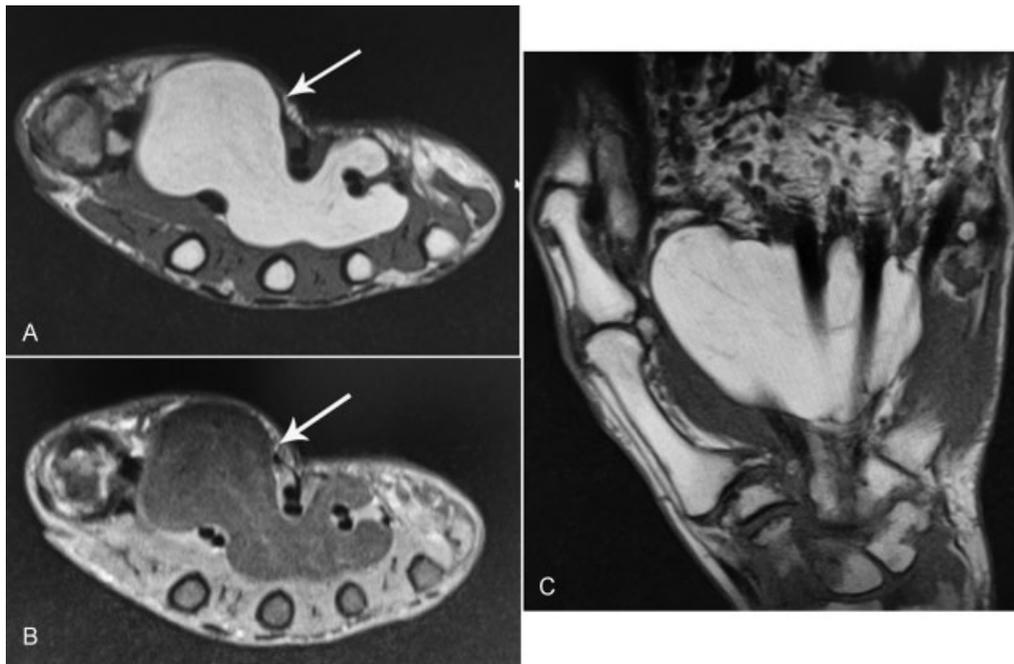


Fig. 2 (A) Axial T1-weighted, (B) axial fat-suppressed T2-weighted, and (C) coronal T1-weighted images reveal an intermuscular lipoma at the central region on the palmar side (arrows).

Dimension of lipoma located in palmar area on ventral side, on dorsal side, on wrist, and finger were 31.43 ± 6.93 , 10.15 ± 4.45 , 23.15 ± 1.2 , and 10.3 ± 1.83 , respectively. Lipoma dimension located in ventral side was significantly more than lipomas located in dorsal side ($p = 0.02$) and finger ($p = 0.02$).

In 78% of lipoma cases were asymptomatic; 22% of cases were symptomatic. The mass was excised since it caused to loss of sensation in one patient's fingers where nerves

distribute, limitation in movements in two cases on ventral side by central localized mass, and also localized pain in finger in one case. In two asymptomatic cases, excision is applied due to cosmetic reason.

All masses were homogeneous internal structure in MRI analysis. Few thin septation were found in mass in three cases. None of the cases had septa inside the mass that showed nodularity, which is defined as a malignancy criterion. In all six cases performed in histopathologic examination, the mass

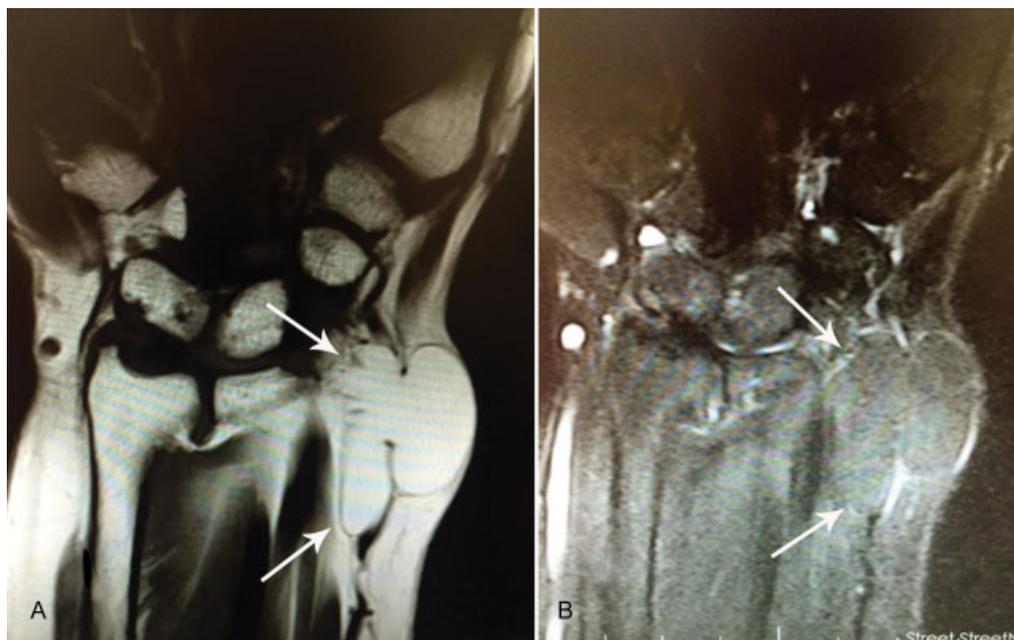


Fig. 3 (A) Coronal T1-weighted and (B) coronal fat-suppressed T2-weighted images show a superficially located lipoma at the dorsal aspect of the wrist (arrows).



Fig. 4 (A) Coronal T1-weighted and (B) coronal fat-suppressed T2-weighted images show a superficially located lipoma at the lateral aspect of the second finger proximal phalanx (arrows).

was composed of mature adipocytes lobules. There were no mesenchymal elements or cellular atypia.

Discussion

Ordinary lipoma is the most common soft tissue tumor in adults, accounting for almost 30 to 50% of all soft tissue tumors.⁶ It occurs over a wide age range but is most common between the

ages of 40 and 60 years. Lipomas may occur anywhere in the human body but are most frequently located on the trunk. In our study, it was found that lipomas located in the hand were most frequently originated from the palmar region ($p = 0.017$). It is logical that the lipoma consisted of mature adipocytes chooses palmar area since fat tissue in this area is more than other areas. Ordinary lipoma is generally located in subcutaneous tissue as in our study. It is located in deep tissue, intramuscular, or intermuscular area in less rate.² In this study, deeply located lipomas were observed in two cases (11%). The mass was centrally located in palmar area in both cases.

Clinically, lipomas usually exist as a painless mass. However, in the literature, there have been reported limitation of motion, wrist and finger deformity⁷ decrease in clamping force,⁸ muscle paralysis,⁹ trigger finger,¹⁰ dysesthesia, muscular atrophy,¹¹ and cases causing dystrophy and thinning in nail fold.¹² In our study, the most common presentation type of lipoma in symptomatic patients was limitation in movement depending on dimension. In both cases, the mass was in palmar side and centrally located. As an interesting point, it is observed that the masses located in palmar side was significantly bigger dimension than other locations ($p = 0.02$). This finding indicates that palmar area is a potential gap for the slow-growing lipomas.

Our study has several limitations. The first one was there was not histopathologic analysis for all the patients who have fat component in mass in MRI. The second one was the small number of patients because of rare lipomatosis mass.

As a result, the most frequent benign lipomatosis mass in hand and wrist is ordinary lipoma. Lipoma almost always is observed in mid-elderly individuals. It is observed in palmar and ventral sides mostly. Lipomas located in palmar area tend to be bigger size comparing with other locations. Deep-seated

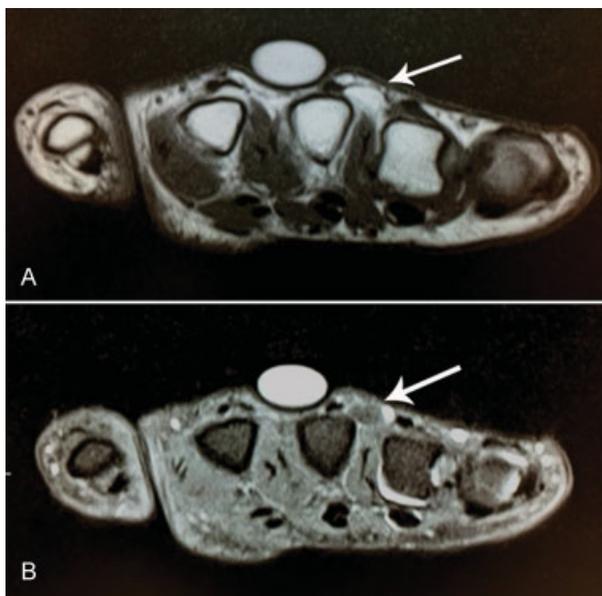


Fig. 5 (A) Axial T1-weighted and (B) coronal fat-suppressed T2-weighted images reveal a subcutaneous lipoma on the hand's dorsal side (arrows).

lipoma is localized in central area frequently. In ordinary lipoma cases, patients are generally asymptomatic. The most frequent clinical symptom is limitation in movement depending on mass dimension. Cellular atypia is very rare.

Ethical Approval

All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. For this type of study, formal consent is not required.

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