

## Case Report



# Tc-99m-Diphosphonate Uptake in a Giant Ancient Schwannoma of the Arm

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### ABSTRACT

We present a 77-year woman with a size of 9.5x9x7cm giant ancient schwannoma located in the lower arm. Increased activity accumulation in the tumor was seen on the Tc-99m-methylene diphosphonate bone scintigraphy. After excision of the tumor, Pathologic diagnosis could be illustrated as an ancient schwannoma. Previous studies reported that Schwannoma could be demonstrated with increased Tc-99m-diphosphonates activity accumulation but we speculate that this accumulation may be related to tissue types or atypical types of schwannoma. ©2006, Fırat Üniversitesi, Tıp Fakültesi

**Key words:** Nerve tumor, schwannoma, scintigraphy, Tc-99m-medronate

### ÖZET

#### Kolun Dev Antik Schwannom'unda Tc-99m Difosfonat Tutulumu.

Kolda yerleşik 9.5x9x7cm boyutta dev antik schwannom'lu 77 yaşında bayanı sunmaktayız. Tc-99m-metilen difosfonat kemik sintigrafisinde tümörde artmış aktivite birikimi izlendi. Tümörün eksizyonu sonrasında patolojik tanı antik schwannom olarak gösterildi. Önceki çalışmalarda schwannom'un artmış Tc-99m-difosfonat aktivite birikimi ile gösterilebildiği yayınlanmıştır fakat biz birikimin schwannom'un doku tipleriyle veya atipik çeşitleri ile alakalı olabileceğini düşünmekteyiz. ©2006, Fırat Üniversitesi, Tıp Fakültesi

**Anahtar kelimeler:** Sinir tümörü, schwannoma, sintigrafi, Tc-99m-medronat

Schwannoma, also referred neurilemmoma and neurinoma, is rare benign neurogenic tumor developing from Schwann cells arising from of a nerve. The most common sites of occurrence of peripheral nerve schwannomas are the head and neck region, trunk and extremities, but may appear anywhere. As a rule, they grow slowly over a period of years. Outside the setting of neurofibromatosis-2, most schwannomas are solitary (1-3). Ancient schwannoma is an uncommon variant of neurilemmoma that display pronounced degenerative changes such as cyst formation, calcification, hemorrhage, and hyalinization (4, 5).

Imaging methods are important for characterizing the lesions, and they may suggest the diagnosis. However, definitive diagnosis is obtained by biopsy or pathological analysis of the operative specimen.

### CASE REPORT

A 77-year woman was referred to our institution for evaluation and treatment of a mass in her volar surface of right lower arm with a localized pain but no symptoms of any paresthesia, hypesthesia and motor and sensory deficit as long as 10 years.

On radiologic evaluation, 10x8x7 cm multiloculated cystic mass with small solid areas and septae in the lateral sur-

face of the upper arm was showed on the ultrasonography and magnetic resonance imaging. In addition, a fluid-fluid level indicating hemorrhage was present within a largest cystic area on T2-weighted sequences. T1-weighted images after administration of Gd-DTPA showed marked enhancement at the solid components and septae.



**Figure 1.** An increased blood flow around of the large hypoactive areas was seen in the second phase of the bone scan.

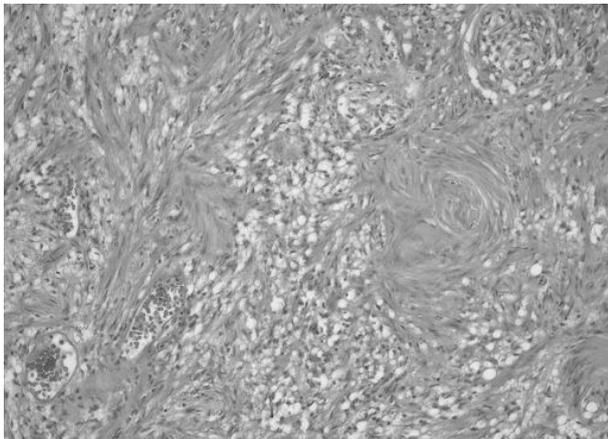
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Technetium-99m methylene diphosphonate bone scan was performed. An increased blood flow around of the large hypoactive areas was seen in the second phase of the bone scan (fig. 1). The delayed image showed significant irregular activity accumulation in the lesion on bone scan (fig. 2).



**Figure 2.** The delayed image showed significant irregular activity accumulation in the lesion on bone scan (fig. 2).

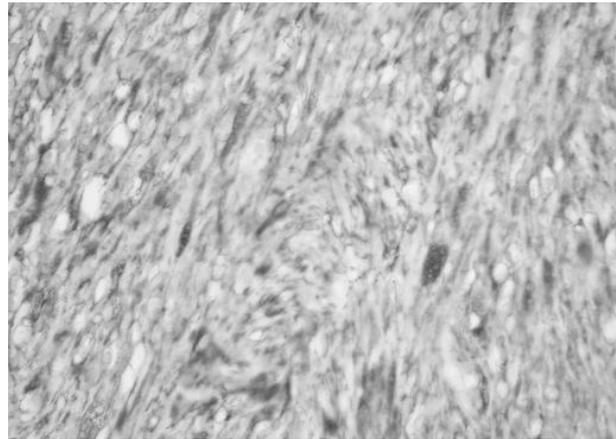
Surgical exploration disclosed an encapsulated mass arising from a musculocutaneous nerve. Histopathologically the spindle cells are arranged in short bundles or interlacing fascicles. In some areas there was whorling of the cells. Scattered atypical cells were seen. There was neither mitosis nor anaplasia. The schwann cells were expressing invariably strong, diffuse immunoreactivity for S-100 protein and vimentin (fig 3 and 4). Staining for alpha smooth muscle actin and desmin was not observed. According to these findings, the case was reported as an ancient schwannoma.



**Figure 3.** An H & E-stained section shows spindle cells arranged in bundles and whorls with alternating loosely textured areas. (hematoxylin-eosin, original magnification  $\times 200$ ) (fig. 3).

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**Figure 4.** Immunoperoxidase staining for S-100 protein shows intense diffuse cytoplasmic and nuclear positivity. Note the fascicular arrangement of cells with scattered atypical nuclei. (immunohistochemistry S-100, original magnification  $\times 400$ ) (fig. 4).

## DISCUSSION

The term ancient schwannoma was introduced by Ackerman and Taylor in their description of 10 benign tumors of the thorax demonstrating extensive hyalinization. Aside from nuclear atypia, additional changes associated with the degenerative process include formation of cysts, stromal edema, xanthomatous change, hemorrhage, accumulation of siderophages, calcification and hyalinization (3, 4)

The differential diagnosis of peripheral nerve schwannomas include neurofibroma, malignant peripheral nerve sheath tumor, leiomyoma, lymphadenopathy, vascular anomalies, lipomas, angiomas and dermal nerve sheath myoma (2, 6).

Ultrasonography, magnetic resonance and computed tomography were enabled the correct diagnosis of schwannoma. But differential diagnosis of these tumors by imaging modalities can be difficult (6, 7). Nuclear medicine may be help for differential diagnosis and distinguish benign schwannoma from malignancy. Previous authors reported that schwannoma could be demonstrated with increased Tc-99m-(V) DMSA (8), F-18-FDG (9), Tl-201 (10), I-131-MIBG (11), Tc-99m-diphosphonates (12) activity accumulation but did not uptake Ga-67 (8) and Indium-111 octreotide (7).

In conclusion, surgeons should have a current knowledge of the diagnostic possibilities and the treatment options about peripheral nerve tumors such as schwannomas. The ancient schwannoma can be demonstrated with the bone scintigraphy.

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