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Case Report

Multiple intranodal leiomyomas in a patient with human immunodeficiency virus infection

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Abstract: *Objectives:* To report a case of rare multiple intranodal leiomyomas in the neck of a patient with human immunodeficiency virus (HIV) infection. *Methods:* A 36-year-old man with HIV infection visited our hospital, presenting with a 6-month history of frontal headache and a 3-year history of a painless mass in the left upper neck. Computed tomography (CT) revealed a well-marginated mass, measuring approximately 6 cm (largest dimension) in the left upper neck. Moreover, four nodular lesions in the brain, a mass in the left hepatic lobe, a mass in the spleen, a mass occupying the right prerenal space, a mass arising from the left sacroiliac joint, and an osteolytic mass involving the right side of the fifth lumbar vertebra were observed through CT. The patient subsequently underwent excision of the neck mass, sonoguided biopsy of the mass occupying the right prerenal space, and excision of the four brain nodular lesions. *Results:* Histopathological sections of the neck mass revealed multiple intranodal leiomyomas. Moreover, leiomyomas were diagnosed in the right prerenal space and the brain. *Conclusion:* Intranodal leiomyoma is extremely rare and should be considered in the differential diagnosis of primary spindle cell lesions of lymph nodes, particularly in patients with HIV infection.

Keywords: Intranodal leiomyoma, human immunodeficiency virus

Introduction

Although smooth muscle tumors (including leiomyomas and leiomyosarcomas) have recently been reported in children with human immunodeficiency virus (HIV) infection [1, 2], primary smooth muscle tumors of lymph nodes are extremely rare in patients with HIV infection. Intranodal leiomyomas, which are distinctive primary myofibroblastic neoplasms of lymph nodes as reported by Starasoler *et al*. in 1991, have expanded the clinical and morphological spectra of primary spindle cell neoplasms of lymph nodes. Previously confused with schwannomas, intranodal leiomyomas have also been designated as “palisaded myofibroblastomas”, “intranodal hemorrhagic spindle cell tumors with amianthoid fibers”, and “spindle cell tumors with myoid differentiation” [3].

According to our research, to date, four cases of intranodal leiomyomas have been reported in the English literature (**Table 1**) [3-5]. In this study, we presented a case of multiple intranodal leiomyomas developing in the neck of a patient with HIV infection.

Case report

A 36-year-old man with HIV infection visited our hospital, presenting with a 6-month history of frontal headache and a 3-year history of a painless mass in the left upper neck. The headache was persistent and was associated with tightness and pressure.

The patient had received a diagnosis of HIV infection 6 years earlier. Highly active antiretroviral therapy for treating the HIV infection [lamivudine (150 mg b.i.d), zidovudine (300 mg b.i.d), lopinavir (400 mg b.i.d), and ritonavir (10 mg b.i.d)] was administered after the diagnosis. Moreover, the patient had histories of cryptococcemia, syphilis, and pulmonary tuberculosis, which occurred 6 years prior.

On physical examination, a firm mass with a diameter of 6×4 cm was palpated in the left

Table 1. Summary of cases of intranodal leiomyoma published in the English literature

Authors	Age/sex	Location	Size	Clinical features
Starasoler et al. (1991)	38/M	Peripancreatic lymph node	1.7 cm	Died of AIDS-related infection
	34/M	Intraparotid lymph node	1.8 cm	Otherwise asymptomatic
Obana et al. (1996)	39/F	Iliac lymph nodes	Soybean size	Keratinizing epidermoid carcinoma of the cervix s/p radical hysterectomy and bilateral salpingo-oophorectomy with pelvic lymph nodes dissection
Girhotra et al. (2014)	6/M	Neck lymph node	1 cm	Otherwise asymptomatic

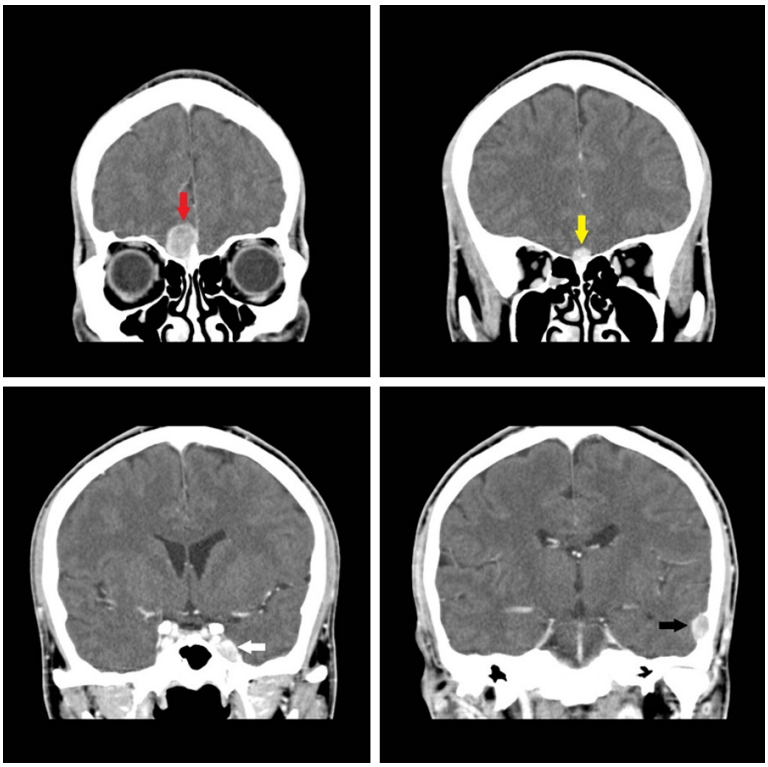

Figure 1. Contrast-enhanced CT of the brain revealed four hyperdense nodular lesions. One lesion, measuring 1.6 cm in diameter, was located in the anteromedial basal area of right frontal lobe, abutting the falx cerebri (red arrow). Two lesions, measuring approximately 1 cm each in diameter, were located in the anterior portion of interhemispheric fissure directly above the ethmoid sinus (yellow arrow) and left temporal lobe, abutting the carotid sinus (white arrow). The fourth lesion, measuring approximately 1.4 cm, was located in the periphery of the left temporal lobe, resulting in bone erosion (black arrow).

upper neck. However, the results of the patient's neurological examination were normal.

Initial laboratory studies on admission revealed the following abnormal findings: hemoglobin level, 5.8 g/dL; $CD4^+$ T lymphocyte count, 0.9 cells/mm^3; and serum HIV viral load, 111800 copies/mL.

Contrast-enhanced computed tomography (CT) of the brain revealed four hyperdense nodular lesions in the brain. One lesion, measuring 1.6 cm in diameter, was located in the anteromedial basal area of the right frontal lobe, abutting the falx cerebri. Two lesions measuring approximately 1 cm each in diameter, were located in the anterior portion of the interhemispheric fissure directly above the ethmoid sinus and the left temporal lobe, abutting the carotid sinus. The fourth lesion, measuring approximately 1.4 cm in diameter, was in the periphery of the left temporal lobe, resulting in bone erosion. All the lesions exhibited moderate homogeneous contrast enhancement (**Figure 1**).

Contrast-enhanced CT of the neck revealed a well-marginated mass, approximately 6 cm (largest dimension), in the left upper neck. No grossly identifiable tumor was observed in the nasopharynx, oropharynx, hypopharynx, or larynx. The parotid glands, submandibular glands, and thyroid gland were unremarkable (**Figure 2A**).

Contrast-enhanced CT of the entire abdomen revealed the following: a 3-cm hypodense mass, exhibiting moderate heterogeneous contrast enhancement, in the left hepatic lobe (S5 segment); a 3.8-cm hypodense mass, exhibiting moderate homogeneous contrast enhancement, in the spleen; a 3.5-cm mass, exhibiting moderate heterogeneous contrast enhancement, occupying the right prerenal space; a 4-cm intermediate hypodense mass, exhibiting moderate homogeneous contrast enhancement, arising from the left sacroiliac joint, and consequently, causing remodeling of the adjacent bone; and

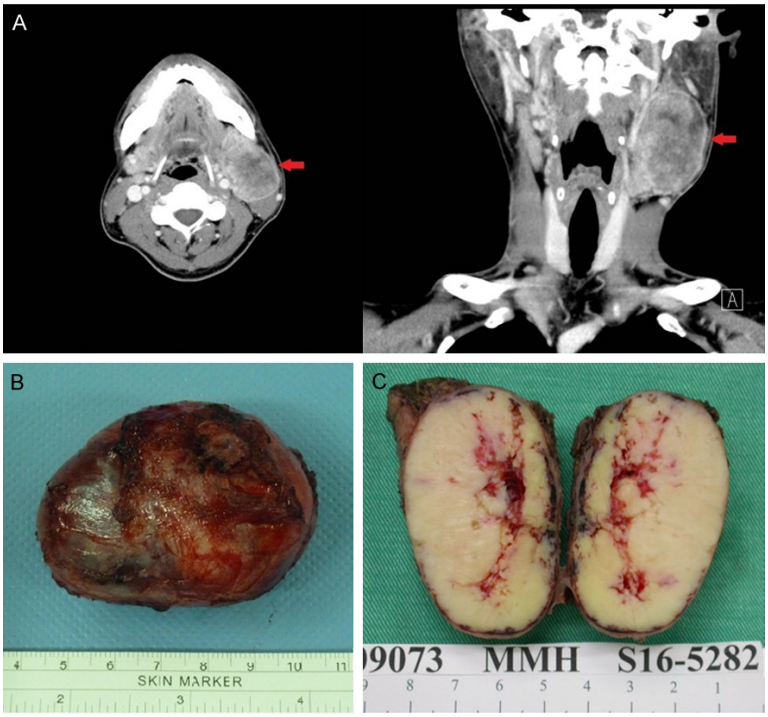

Figure 2. Contrast-enhanced CT of the neck revealed a well-marginated mass measuring 6 cm (largest dimension) in the left neck (A, red arrows). During surgery, a well-demarcated, firm, gray–white mass measuring 6×4×3.7 cm^3 was excised (B). The mass was subtotally occupied by an oval firm tumor with light yellow solid surface, which appeared white to red, in the cut regions (C).

an osteolytic mass involving the right transverse process as well as the pedicle and body of the fifth lumbar vertebra. No significant abnormality was found in the pancreas, stomach, left adrenal gland, bowel, kidneys, or urinary bladder. Furthermore, no ascites was observed (**Figure 3**).

The patient subsequently underwent excision of the left neck mass. During surgery, a well-demarcated, firm, gray–white mass measuring 6×4×3.7 cm^3 was excised (**Figure 2B**). Macroscopic examination of the mass revealed a light yellow solid surface, which appeared white to red, in the cut regions (**Figure 2C**). Microscopically, the mass was composed of a major enlarged lymph node and three lymph nodes attached to the periphery. The histopathological sections of the mass revealed that the lymph nodes were subtotally occupied by spindle cell tumors (**Figure 4A**). The spindle cells appeared plump and bland. They contained pinkish cytoplasm and were set either individually or intersecting with mildly whorling small fascicles. No significant nuclear atypia or mitotic activity was observed (**Figure 4B**). Immunostaining revealed that the tumor cells exhibited strongly positive staining for actin (**Figure 4C**). Many cells were positive for desmin (**Figure 4D**) and negative for S100. Thus, multiple intranodal leiomyomas in the left neck were diagnosed.

The patient also underwent ultrasound-guided biopsy of the mass occupying the right prerenal space. The histopathological sections revealed a strip of entirely lesional tissue composed of interlacing fasciles of fairly uniform spindle cells with moderate cellularity. No significant nuclear atypia or mitoses were observed. Tumor necrosis of the ischemic type instead of the malignant-geographic type was observed in most of the mass. The tumor cells exhibited strongly positive staining for actin. However, they stained negative for desmin, S100, CD117, Factor VIII, and CD34. Immunostaining for Ki-67 revealed an extremely low proliferative index in the tumor cells. These features indicated that the tumor was a leiomyoma.

Furthermore, the patient underwent excision of the four brain tumors detected through contrast-enhanced CT. Histopathological sections of the brain tumors indicated that they were also leiomyomas.

The patient was free of recurrence and was in a relatively stable condition at the most recent follow-up (1 year after admission). His $CD4^+$ T lymphocyte count was 506.1 cells/mm^3 and the serum HIV viral load was <20 copies/mL.

Discussion

Intranodal leiomyomas are composed of interlacing fascicles of spindle cells with blunt-ended nuclei that appear to arise from the walls of blood vessels. Although somewhat less specific, muscle-specific actin is more sensitive than is desmin; therefore, actin labels a higher number of smooth muscle tumors than does desmin. A lack of desmin-immunoreactivity does not impede the diagnosis of leiomyomas because the expression of the intermediate fil-

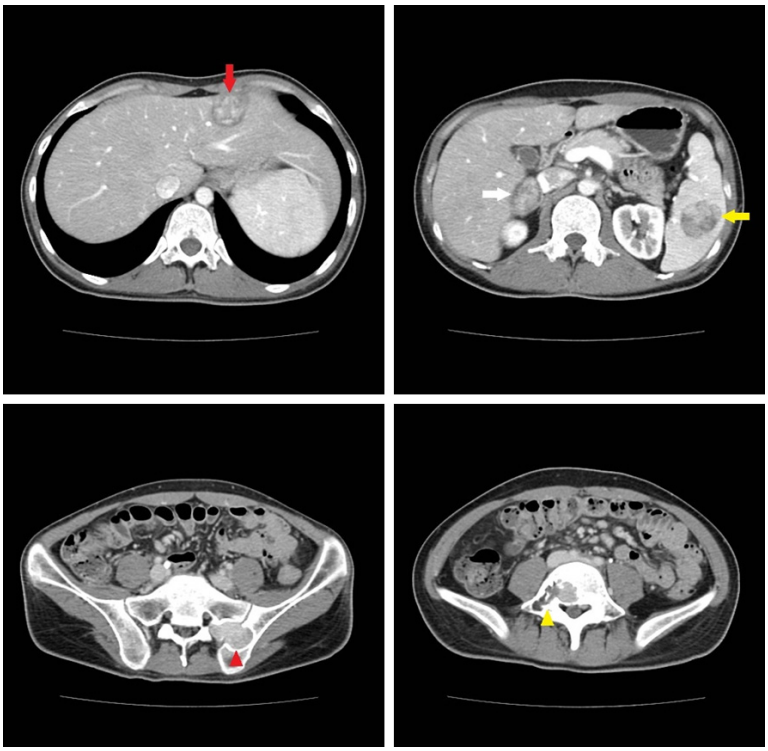

Figure 3. Contrast-enhanced CT of the entire abdomen revealed the following: a 3-cm hypodense mass, exhibiting moderate heterogeneous contrast enhancement (red arrow), in the left hepatic lobe (S5 segment); a 3.8-cm hypodense mass, exhibiting moderate homogeneous contrast enhancement (yellow arrow), in the spleen; a 3.5-cm mass, exhibiting moderate heterogeneous contrast enhancement (white arrow), occupying the right prerenal space; a 4-cm intermediate hypodense mass, exhibiting moderate homogeneous contrast enhancement (red arrowhead), arising from the left sacroiliac joint and resulting in remodeling of the adjacent bone; and an osteolytic mass involving the right transverse process as well as the pedicle and body of the fifth lumbar vertebra (yellow arrowhead).

ament protein in vascular smooth muscle is quite variable [3].

Intranodal leiomyomas, however, should be distinguished from intranodal myofibroblastomas, Kaposi's sarcomas, leiomyosarcomas, other metastatic spindle cell tumors, and neurilemomas [6].

Intranodal myofibroblastomas are spindle cell tumors with prominent amianthoid fibers, intralesional hemorrhages, and intracellular or extracellular inclusions [5]. Although cytologically similar, intranodal leiomyomas differ from intranodal myofibroblastomas because they lack nuclear palisading, characteristic areas of hyalinized collagen with a stellate configuration (amianthioid fibers), and globular fuchsinophilic cytoplasmic inclusions of the intranodal myofibroblastomas [3].

Kaposi's sarcoma is the most common mesenchymal spindle cell neoplasm of the lymph nodes in patients with acquired immunodeficiency syndrome (AIDS). During autopsy, AIDS-related Kaposi's sarcomas are almost invariably found to affect several or multiple lymph nodes. The characteristic histological features of Kaposi's sarcoma include atypical spindle cells admixed with slit-like vascular spaces, extravasated red blood cells, and extracellular hyaline globules [3]. Moreover, most Kaposi's sarcomas are positive for endothelial cell markers such as Factor VIII-related antigen [7]. In the case reported herein, the lack of cytological atypia and mitotic figures excluded the possibility of leiomyosarcomas.

Intranodal leiomyomas should be distinguished from spindle cell tumors in lymph nodes that are presumed to have reticulum cell lineage. The cells of spindle cell tumors exhibit nuclear atypia, are S-100 protein positive, and lack immunoreactivity for muscle-specific actin. Round cells with vesicular nuclei and inconspicuous nucleoli are also observed in some of these lesions [8].

The association of smooth muscle tumors with AIDS has been recorded previously [1-3]. HIV may play a direct role in the origin of mesenchymal neoplasms [1, 3]. The optimal therapeutic strategy for treating smooth muscle tumors in patients with HIV infection is currently controversial. Sufficient evidence to establish the efficacy and acceptability of the various interventions is not available, and Yin *et al.* recommend case-by-case treatment of patients until further evidence becomes available [2].

Our case report leads us to make a pertinent point. Intranodal leiomyoma is extremely rare and should be considered in the differential diagnosis of primary spindle cell lesions of

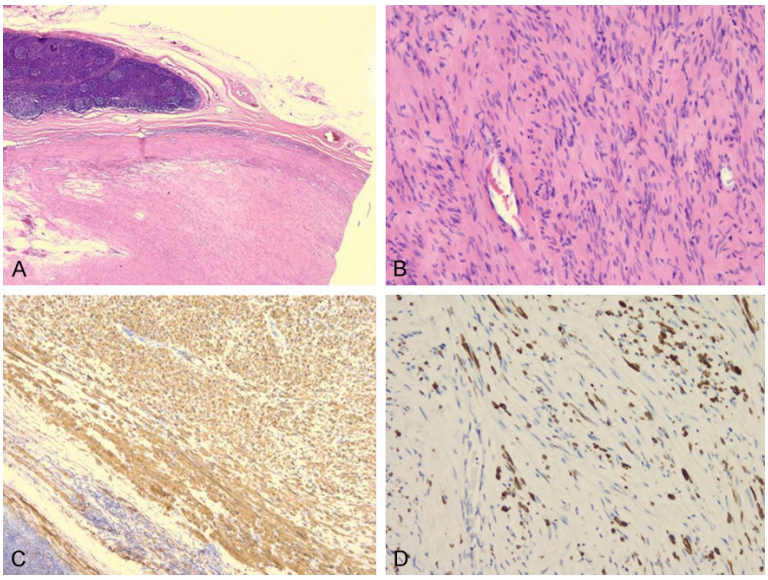

Figure 4. Histopathological sections of the major enlarged lymph node revealed that the lymph node was subtotally occupied by spindle cell tumors (A, hematoxylin and eosin, 20×). The spindle cells appeared bland and plump. They had pinkish cytoplasm and were set either individually or intersecting with mildly whorling small fascicles. No significant nuclear atypia or mitotic activity was observed (B, hematoxylin and eosin, 200×). Immunostaining revealed that all the tumor cells showed strongly positive staining for actin (C), and many cells stained positive for desmin (D).

lymph nodes, particularly in patients with HIV infection.

Disclosure of conflict of interest

None.

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