Post-radiation primary intranodal leiomyosarcoma

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Abstract
An unusual case of post-radiation primary intranodal leiomyosarcoma of the cervical lymph node is presented. The patient was a 32-year-old white man who was treated in 1986 with hemiglossectomy and right neck dissection, followed by radiation therapy, for squamous cell carcinoma of the tongue. Six years later, he presented with an enlarged left cervical lymph node which on biopsy showed a high grade spindle cell malignant neoplasm. Immunohistochemistry and electron microscopic study verified the smooth muscle origin of the tumour.

Extensive work-up for a second primary lesion was negative. Primary intranodal leiomyosarcoma is extremely rare. We briefly discuss the histological differential diagnosis of spindle cell lesions of lymph nodes, leiomyosarcoma of the vessel wall and radiation-associated sarcoma.

Key words: Leiomyosarcoma; Lymph nodes; Neck; Radiotherapy, complications; Carcinoma, squamous cell; Tongue

Introduction
Spindle cell tumours and tumour-like lesions of lymph nodes are rare occurrences. Most of these lesions are metastatic neoplasms, namely, malignant melanoma, spindle cell carcinoma and, rarely, malignant fibrous histiocytoma. There are several recently described primary spindle cell tumours of lymph nodes arising from the myofibroblast (Berman et al., 1986; Amendola et al., 1989). Gradually expanding categories of spindle cell lesions involving lymph nodes have been observed (Lee et al., 1989). Rarely, intranodal leiomyomas have been described (Fong et al., 1993). In patients with the acquired immunodeficiency syndrome (AIDS), Kaposis’s sarcoma and infection-associated spindle cell pseudotumours have been observed (Lee et al., 1989). Gradually expanding categories of spindle cell lesions involving lymph nodes make it necessary for the pathologist to be aware of unusual presentations of primary intranodal spindle cell neoplasms.

We describe here a very unusual case in which a post-radiation leiomyosarcoma occurred as a solitary cervical lymph node lesion six years after hemiglossectomy and post-operative radiation therapy for squamous cell carcinoma. Histology showed a high-grade spindle cell proliferation in the lymph node initially suspected of being a metastatic spindle cell variant of squamous cell carcinoma. Since surgery, the patient had an uneventful post-operative course and remained free of disease 12 months after surgery.

Case report
The patient was a 32-year-old white male who presented for evaluation of a left neck mass. At age 26 years the patient was suspected of being a metastatic spindle cell variant of squamous cell carcinoma (Figure 1). Frequent keratin pearl formation and frequent mitotic figures were consistent with leiomyosarcoma. Since surgery, the patient had an uneventful post-operative course and remained free of disease 12 months after surgery.

Pathological features
Gross examination of the hemiglossectomy specimen showed a 2 cm diameter, rubbery, bosselated, partially ulcerated tumour involving the lateral aspect of the right side of the tongue. Microscopically, it was an invasive well differentiated squamous cell carcinoma (Figure 1). Frequent keratin pearl formation and intercellular bridges were seen. Resection margins were uninvolved. Eight out of twenty-two right cervical lymph nodes had metastatic squamous carcinoma with extranodal spread. The histopathological stage was T1N1bMX.

The left cervical lymph node biopsy consisted of an oval, tan pink and rubbery lymph node 2 cm in its greatest dimension. Microscopically, the lymph node architecture was largely replaced by a proliferation of malignant spindle cells having blunt-ended, elongated nuclei and abundant cytoplasm, and arranged in interlacing fascicles (Figures 2, 3 and 4). Focally, the tumour extended to the capsule of the node with loss of the pericapsular sinuses. In other areas, there was a peripheral rim of residual lymph node structure (Figure 2). There was an increased

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Section of cervical lymph node (1993) showing spindle-cell proliferation with residual nodal architecture at the periphery. (H&E; × 60).

Recent studies described the rare occurrence of additional spindle cell neoplasms primarily involving lymph nodes (Berman et al., 1986; Amendola et al., 1989; Lee et al., 1989; Suster and Rosai, 1989; Fletcher and Stirling, 1990; Starasoler et al., 1991; Chen, 1992; Fong et al., 1993). Rare cases of primary benign spindle cell neoplasms of possible dendritic reticulum cell differentiation have been documented (Starasoler et al., 1991). Microscopically they grow in interwoven, storiform, and nesting patterns. Ultrastructurally, these cells characteristically show numerous long, complex, thin cytoplasmic extensions as in normal dendritic reticulum cells. Immunohistochemically, the cells show immunoreactivity for several macrophage antigens and complement receptors including CD21 (CR2) and CD35 (C3bR).

The unusual occurrence of myofibroblastic proliferation of lymph nodes has been reported with a variety of names, including palisaded myofibroblastoma, intranodal haemorrhagic spindle cell tumour with ‘amianthoid fibres’ and intranodal myofibroblastoma (Berman et al., 1986; Amendola et al., 1989; Chen, 1992).

In 22 cases of palisaded myofibroblastoma reported by Weiss et al. (1989) these intranodal lesions were composed of palisaded fascicles of spindle cells alternating with mats of eosinophilic material (Amendola et al., 1989). These spindle cells were actin positive but S-100 protein, desmin, and keratin negative. They were thought to be derived from myofibroblasts, myoid cells or specialized smooth muscle cells of lymph node capsules and trabeculae. They were exclusively found in groin lymph nodes and all were benign without evidence of recurrence of metastasis.

In six cases of intranodal haemorrhagic spindle cell tumour with ‘amianthoid fibres’ reported by Suster and Rosai (1989), the spindle cell lesion was confined to inguinal lymph nodes (Berman et al., 1986). The stellate-shaped areas containing thick collagen fibres (‘amianthoid fibres’), and vascularized interlacing fascicles of spindle cells were circumscribed by irregular bands of sclerosis and haemorrhage. Immunohistochemically, these cells were positive for muscle specific actin, myosin, and vimentin, but negative for desmin.

Fletcher and Stirling (1990) reported two cases of similar myofibroblastic cell tumour in the submandibular lymph nodes. All of these tumours reported by various names seem to describe a similar benign spindle cell tumour of myofibroblastic origin. Although there may be interstitial haemorrhage, there is no evidence of necrosis or nuclear pleomorphism. Rare normal mitoses, up to three out of 50 high power fields may be seen.

Two rare cases of intranodal leiomyomas have been previously described (Fong et al., 1993). One case involved a peri-pancreatic lymph node in a patient with AIDS. Another case arose in an intra-parotid lymph node. Both of the neoplasms
were composed of interlacing fascicles of spindle cells that seemed to arise from the blood vessel walls. The tumour cells were immunoreactive for muscle specific actin but were desmin negative. Desmin expression in vascular muscle seems variable and desmin negativity did not argue against the diagnosis of leiomyosarcoma. The lack of cytological atypia and mitotic figures excluded the possibility of leiomyosarcoma.

In patients with AIDS, several distinct spindle cell lesions are known to occur. Kapoš’s sarcoma is mostly confined to immunocompromised patients and is comprised of a spindle cell proliferation mixed with slit-like vascular structures and extravasation of red blood cells. Rarely, primary lymphadenopathic Kapoš’s sarcoma may occur in an immunocompetent individual (Suster and Rosai, 1989).

Infection-related spindle cell pseudotumour lesions must also be considered in the differential diagnosis of nodal spindle cell lesions. ‘Mycobacterial spindle cell pseudotumour’ in patients with AIDS should be differentiated from Kapoš’s sarcoma as both lesions exhibit fascicles of spindle cells, a vascular component, mitoses and hyalin globules (Lee et al., 1989). The spindle cells in mycobacterial infection, however, are phagocytic cells with large numbers of mycobacteria. These cells are immunoreactive for vimentin, lysozyme, and alpha-1-antitrypsin, and are nonreactive to actin, desmin, and HMB 45.

In our case, the possibility of a recurrent spindle cell variant of squamous cell carcinoma was excluded by the immunohistochemical and electron microscopic findings (Weiss et al., 1987), both of which showed typical characteristics of smooth muscle cells without an epithelial component. Extensive work-up for a second primary lesion was negative. Lymph node metastasis from primary soft tissue sarcomas usually occurs in an advanced stage (Nakhleh et al., 1993). We speculate, therefore, that the current neoplasm possibly arose de novo from the structure of the lymph node.

There are several criteria for the diagnosis of radiation-induced sarcomas: a previous history of radiotherapy to the area where the sarcoma arose, a period of at least three to five years after the radiation, and the histological diagnosis of sarcoma (Weiss et al., 1989, 1990). Our case fulfilled these criteria.

The term ‘radiation-associated sarcoma’ (RAS) was favoured by Amendola et al. (1989) because a sarcoma in the previous radiation field may be attributed to genetic predisposition, chemotherapy, other predisposing factors, or it may be a coincidence (Weiss et al., 1989). Common histopathological types of these radiation-associated tumours are fibrosarcoma, malignant fibrous histiocytoma, and osteogenic sarcoma. Less frequently, post-radiation leiomyosarcoma can arise in subcutaneous or deep soft tissue of a previously irradiated field.

Rarely, leiomyosarcoma can arise primarily in the vascular wall, such as from the inferior vena cava, renal veins and other large veins or arteries. Weiss et al. (1987) reported a case of radiation associated pleomorphic leiomyosarcoma of the superior vena cava (see also Wiklund et al., 1991).

The present case adds a very unusual type of intranodal spindle cell neoplasm in the setting of post-radiation. Other spindle cell lesions in the differential diagnosis have also been discussed.

In the absence of another primary site, it is possible that the nodal leiomyosarcoma in our patient arose from smooth muscle cells, such as from the vessel wall of the cervical lymph nodes. In our case, it is postulated that radiation therapy played a key role in the development of the tumour. Whether chemotherapy, genetic predisposition or other environmental factors also played a causative role is unknown.

References


Chen, K. T. K. (1992) Mycobacterial spindle cell pseudotumor of


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