

## Case Report

# Nerve fibrolipoma with extensive calcification and ossification: a rare case report

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**Abstract:** Neural fibrolipoma is a kind of benign tumor comprised of hypertrophied fibrofatty tissue with intermixed nerve tissue. Here we report one case of neural fibrolipoma with extensive calcification and ossification on the left neck, which has not been reported in the literature. Based on the literature of neural fibrolipoma, the clinical, pathological characteristics and treatment modalities of this rare tumor type are discussed.

**Keywords:** Nerve fibrolipoma, calcification, ossification, differential diagnosis

### Case report

On January 16, 2015, a 62-year-old presented to the Third Affiliated Hospital of Soochow University suffering from a left cervical mass about 3 years and the size of mass gradually increased recently. In addition, this patient was diagnosed with nasopharyngeal poorly differentiated squamous cell cancer 15 years ago and underwent radiation therapy. Physical examination of the mass showed: size of about 4×3 cm, soft neck, no resistance, a bump at partial lateral part of the left mastoid cervical bosom lock, hard texture, no tenderness, well-circumscribed and good activity. Type-B ultrasonic test showed bilateral thyroid nodules in this patient. A nodule with ossification was measured 4×3 cm in the left mastoid cervical bosom lock, and tumor nature was undetermined.

### Microscopy

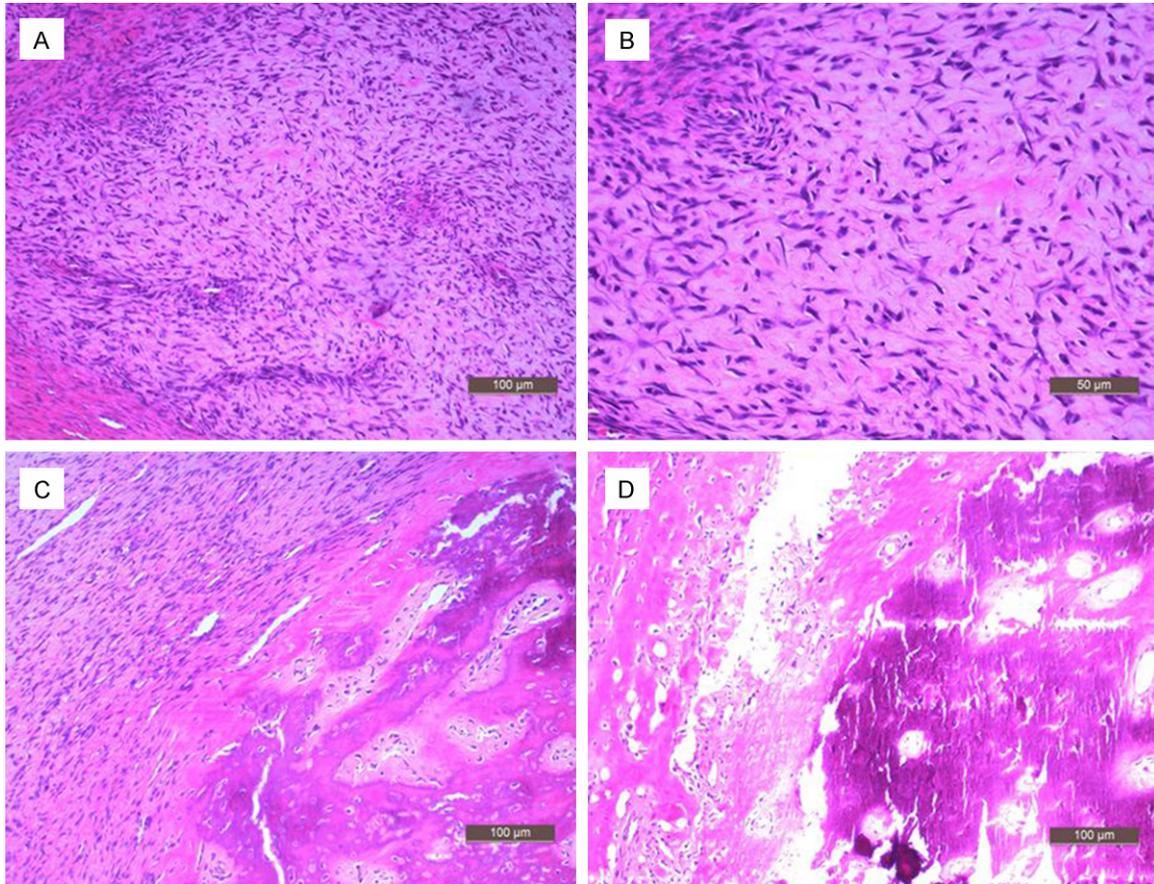
Visual observation showed that the mass in the left neck was off-red or off-white with an original size of 5.5×4×2.5 cm, while the connected skin tissue was at a size of 5×3.5 cm. A circular nodule under skin was at a size of 4×3.5×2 cm, no envelope, and well-circumscribed. The section was off-white, showing solid tumor mass.

Focal of the tumor was myxoid, tumor texture was hard with obvious calcification and ossification. The section was with a sense of gravel and focal infiltration of striated muscle. The tumor tissue was composed of spindle cells that were arranged in plexiform bundles, poorly-circumscribed, slightly eosinophilic to cytoplasm, nuclear hyperchromatism, sharp, wavy or bent forms at both ends (**Figure 1A, 1B**). Funicular collagen fiber was distributed in the tumor cells (**Figure 1A, 1B**). Part of tumor stroma was obviously myxoid with form of nodular or chrysanthemum. Besides spindle cells, extensive calcification and ossification distribution were also obviously observed, and trabecular structure formed by woven bone was found in the ossification area (**Figure 1C**). The surface of trabecular bone was confluent with mutual criss-cross. Punctate calcifications or small lump calcification were observed in the calcification area (**Figure 1D**), and small amount of mast cells were found in the tumor stroma. The tumor cells were not obvious atypia, pathological fission.

### Immunohistochemistry

Immunohistochemical staining was positive for Vimentin (**Figure 2A**), PGP9.5 (**Figure 2B**) and S-100 (**Figure 2C**), while the proliferation index of Ki-67 was low (less than 5%) (**Figure 2D**).

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**Figure 1.** A. Spindle cells were arranged in plexiform bundles (magnification,  $\times 100$ ). B. Slightly eosinophilic to cytoplasm, nuclear hyperchromatism, wavy or bent ends (magnification,  $\times 200$ ). C. Extensive ossification and trabecular structure formed by woven bone (magnification,  $\times 100$ ). D. Punctate calcifications and small lump calcification (magnification,  $\times 100$ ).

Moreover, the tumor cells were negative for CD34 (blood vessels), Desmin and SMA (data not shown).

### Diagnosis

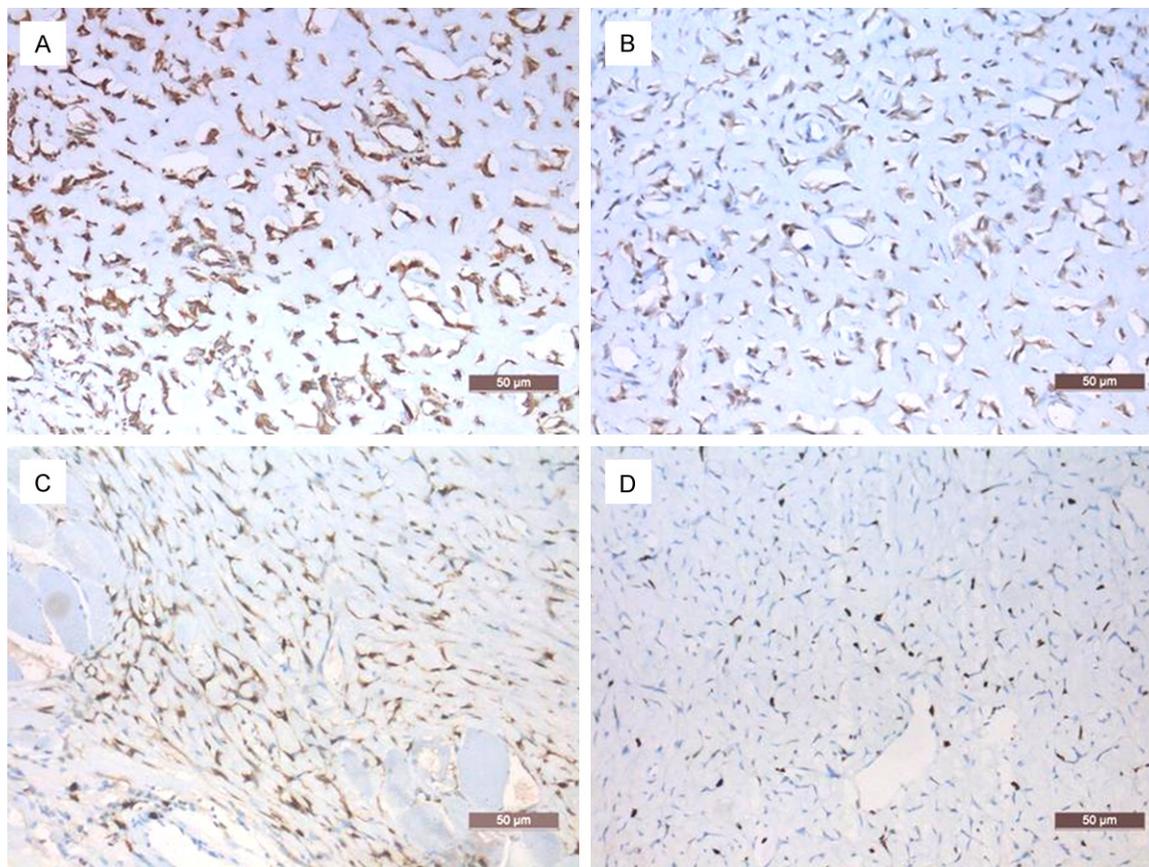
Nerve fibrolipoma in the left neck with extensive calcification and ossification.

### Discussion

Nerve fibrolipoma is a kind of benign peripheral nerve sheath tumor, composed of a mixture of schwann cells, fibroblasts, and transitional cells and with the morphology between perineurial cell and other cells. Neurofibromas may occur in any part of the body and without significant gender differences, account for 5% of benign soft-tissue tumors, and high-risk age is 20-40 years old. About 90% of nerve fibrolipomas are isolated tumor, and mostly distributed in dermis or subcutaneous tissue, but rarely in

deep soft tissue. Neurofibromatosis type 1 (NF1) and type 2 (NF2) are genetically and medically distinct neurocutaneous disorders that are associated with tumors affecting the central and peripheral nervous systems [1]. NF1 includes peripheral neuro-fibromatosis, café-au-lait spots and iris Lisch nodules, etc. NF2 included bilateral or unilateral vestibular neuro-fibroma, meningioma, glioma, cortical cataract of the teenagers, etc [2]. However, neurofibroma with extensive calcification and ossification has been rarely reported and there are two related references in the literature [3, 4]. Possible reason for calcification may be related to local necrosis, liquefaction or chronic hemorrhage with tumor growth. In addition, some cyst-wall calcifications may be caused by tumor-associated cysts. While, ossification may be associated with secondary trauma, inflammation, infection and other factors [3, 4].

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**Figure 2.** Immunostaining showed tumor cells were strongly positive for Vimentin (A); PGP9.5 (B); S-100 (C); weak for Ki-67 (D). Magnification  $\times 200$ .

### Differential diagnoses

However, clinicians should figure out differential diagnoses for other neural tumors, such as schwannoma and sarcomatous degeneration. (1) Both schwannoma and neurofibroma are neurogenic tumors; they can be distinguished by histopathological characteristics. Schwannoma has complete capsule and consists of orderly arrangement of cells in cell rich of zona fasciculata antoni A area and a rich loose myxoid stroma antoni B area. Fence-like structure is mostly found in the tumor tissue. Sometimes tumor cells form verocay bodies, and the small vessel wall of tumor stroma often occurred hyaline degeneration or pigmentation. Schwannoma is more possible to have secondary change than nerve fibroma, such as bleeding, cystic degeneration, necrosis, cholesterol crystal deposition, eosinophils responses and calcification. But the secondary calcification of schwannoma is usually punctate calcifications or line pattern of calcification along the tumor edge.

(2) Myositis ossificans. Microscopy showed hyperplastic property of spindle cells and osteoid tissue was comparable to neurofibroma, but myositis ossificans have the three characteristic zones: the central zone is composed of fibroblasts with loose spindle to fat-spindle, obvious pathological fission, and similar to nodular fasciitis; the intermediate zone is the hyperplasia of fibrovascular and relatively loose tissue with highly viscous fluid, which is formed by chondroid and osteoid tissue; the outer zone is featured with dense fibrous tissue and woven bone or lamellar bone, which is from further mature osteoid tissue. (3) Leiomyoma of the skin. The tumor is generally less than 2 cm in diameter, composed of spindle cells with nodules, abundant cytoplasm, eosinophilic, rod or cigar of nucleus, with mucus degeneration of stroma, but without calcification and ossification. Immunohistochemical staining was positive for SMA and desmin, but negative for S-100 and PGP 9.5 [5]. (4) Fibrous histiocytoma of the skin. The tumor mainly consisted of hyperplas-

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tic spindle cells with arrangement in a plexiform, part of spindle cells arranged in characteristic storiform, and occasionally appeared histocyte-like cells, abundant light-blue cytoplasm. Immunohistochemical staining showed that spindle cells are positive for Vimentin, and histocyte-like cell was positive for CD68, which is different with neurofibroma [6]. (5) Extraskelatal osteosarcoma: the tumor is composed of obvious heterogeneous spindle cells and tumor osteogenesis [7]. It is difficult to distinguish the tumor osteogenesis and osteoid tissue. However, tumorous osteoblasts in osteosarcoma are significantly heterogeneous, polymorphic and pathological fission, which appears along with necrosis and should be distinguished from nerve fibrolipoma.

### Follow-up

The treatment of nerve fibrolipoma was complete resection. At 7-month follow-up, the patient presented well recovery, no recurrence and preservation of neural function.

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### Disclosure of conflict of interest

None.

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### References

- [1] Meneses-Quintero D, Alvarado-Gomez F, Alcalá-Cerra G. Dystrophic thoracic spine dislocation associated with type-1 neurofibromatosis: Case report and rationale for treatment. *J Craniovertebr Junction Spine* 2015; 6: 79-82.
- [2] Khalil J, Afif M, Elkacemi H, Benoulaid M, Keddani T, Benjaafar N. Breast cancer associated with neurofibromatosis type 1: a case series and review of the literature. *J Med Case Rep* 2015; 9: 61.
- [3] Kapoor R, Mittal KP, Jayaram G. Solitary neurofibroma of foot—an unusual case with extensive calcification and ossification. *Australas Radiol* 1986; 30: 150-152.
- [4] Sarma DP, Robichaux J, Fondak A. Ossified neurofibroma. *J La State Med Soc* 1983; 135: 22-23.
- [5] Lambade PN, Palve D, Lambade D. Schwannoma of the cheek: clinical case and literature review. *J Maxillofac Oral Surg* 2015; 14: 327-331.
- [6] Yamasaki F, Takayasu T, Nosaka R, Vishwa AJ, Takeshima Y, Yoshihiro M, Kurisu K. Benign fibrous histiocytoma arising at the temporal bone of an infant-case report and review of the literature. *Childs Nerv Syst* 2015; [Epub ahead of print].
- [7] Lee CH, Park CR, Kim JW, Suh JH, Lee YJ, Jung JP. Extraskelatal osteosarcoma arising from the pleura. *Korean J Thorac Cardiovasc Surg* 2014; 47: 320-4.