Key Message

Trigeminal nerve can be rarely involved in melanotic schwannoma (MS). Knowledge of typical radiological features of MS is crucial for its diagnosis. Its association with Carney complex should be sought.
Case History

A 36-year-old woman presented with imbalance while walking. There was a remote history of sharp object injury to her left eye during her childhood. She complained of left eye vision loss since then. There was no documented history of intervention or surgery in her left eye. Presently, there was no perception to light on clinical examination.

She had diffuse lentigines on skin (Fig. 1g). Hyperdense lesion at the left cerebellopontine angle was noted. Widening of left Meckel’s cave and foramen ovale was appreciated on CT (Fig. 1e, f). On MRI, there was an extra-axial T1 hyperintense and T2 hypointense lesion in the left cerebellopontine angle, following the mandibular division of the left trigeminal nerve trajectory, which was extending to and widening the ipsilateral Meckel’s cave and foramen ovale (Fig. 1a–c). There was no blooming on susceptibility-weighted imaging (Fig. 1c). There was no evidence of diffusion restriction. Homogenous enhancement was noted on T1 postcontrast study (Fig. 1d). Mass effect was noted on the brain stem with perilesional vasogenic white matter edema tracking along the corticospinal tract. Fatty atrophy of left masticator muscles was seen. Incidentally, a deformed left globe was noted with hyperdense content on CT, mild T1 hyperintensity, and T2 hypointensity in the posterior chamber suggestive of incidental chronic vitreous hemorrhage (Fig. 1g). CT, computed tomography; NCCT, noncontrast CT; T1WI, T1-weighted imaging; T2WI, T2-weighted imaging; SWI, susceptibility-weighted imaging.

Histopathology showed tumor cells heavily laden with brownish black melanotic pigment with few interspersed psammoma bodies. Tumor cells were immunoreactive for S100 and HMB45 (Fig. 2). Final diagnosis of PMS was derived on clinical, radiological, and histopathological findings with immunohistochemistry correlation.

Discussion

MS is a rare nerve sheath tumor commonly found in thoracic paraspinal region. They arise from posterior spinal nerve roots or from sympathetic ganglia but are also known to involve in cranial nerves. Only six cases of trigeminal nerve involvement are documented. PMS is a nerve sheath tumor containing melanin-producing cells and psammoma bodies. The mean age of presentation is decade earlier than the conventional schwannoma with peak incidence between fourth and fifth decades of life and no sex predilection. Earlier studies have shown slightly more than 10% of MSs follow a malignant course and show local recurrence after surgery.

MS is associated with Carney complex, a rare multiple neoplasia syndrome with an unknown prevalence. It can be diagnosed as early as in the second year of life and as late as in the fifth decade of life, usually seen more commonly in females. It is inherited in an autosomal dominant manner or occurring sporadically as a result of a de novo genetic defect. It is characterized by multiple endocrine and non-endocrine neoplasms, pigmented lesions of the skin and mucosa, cardiac, cutaneous, and other myxomatous tumors. The diagnostic criteria for Carney complex are (1) at least two manifestations out of spotty skin pigmentation with a typical...
distribution (lips, conjunctiva and inner or outer canthi, vaginal and penile mucosa), myxoma (cutaneous and mucosal), cardiac myxoma, PMS, primary pigmented nodular adrenocortical disease (paradoxical positive response of urinary glucocorticosteroid excretion to dexamethasone administration during Liddle’s test), acromegaly due to growth hormone-producing adenoma, large-cell calcifying Sertoli cell tumor, thyroid carcinoma, blue nevus, breast myxomatosis, breast ductal adenoma, and osteochondromyxoma or (2) one of these manifestations plus one of the supplemental criteria (an affected first-degree relative or an inactivating mutation of the \( \text{PRKAR1A} \) gene).\(^7,8\) Our patient had diffuse lentiginosis (spotty skin pigmentation) and PMS (trigeminal nerve MS and psammomatous bodies at histopathology examination). She has two major diagnostic criteria for Carney complex. Thus, the diagnosis of Carney complex was made. Her family history was negative for Carney complex stigmata.

On CT, they appear isodense or hyperdense and show bone changes. They show variable amount of calcification. On MRI, they appear hyperintense on T1-weighted images, iso/hypointense on T2-weighted images, because of intracellular storage of melanin. In contrast, nonmelanotic type of schwannomas are hypointense on T1 and hyperintense on T2. Homogeneous or heterogeneous enhancement is seen based on degree of tumor cellularity.\(^9\) With typical MRI features, differentials include other melanotic lesions such as malignant melanoma, pigmented meningioma, meningeal melanocytomas, melanotic medulloblastoma, melanotic carcinomas.

Most of these tumors are highly cellular composed of spindled-shaped cells and epitheloid cells. The cells stain positive for reticulum, melanin, and periodic acid–Schiff. They express neural-specific enolase, vimentin, S100 protein and stain variably with HMB45 and other melanocytic markers. Antigen Ki-67 shows variable mitotic index ranging between 1 and 20%.\(^{10}\)

In Carney complex, each specific complication/tumor should be addressed separately. Radical surgical resection is the treatment of choice for MS. Adjuvant radiotherapy remains controversial. Adjuvant radiotherapy is considered after histological confirmation of malignant nature of the tumor.\(^6\)

**Conclusion**

In conclusion, MS is a rare form of pigmented neural tumor. MRI is crucial for diagnosis of intracranial MS and CT...
provides additional information on bony changes. MS in the trigeminal nerve is rare, and has be suspected based on typical MRI findings. MS should be considered in a patient with nerve sheath tumor which appears hyperdense on CT, hyperintense on T1-weighted images, and hypointense on T2-weighted images. Its associations in Carney complex has to be sought by further diagnostic work-up. Complete surgical resection is the treatment of choice and is essential to prevent recurrence. Long-term follow-up is recommended as they carry the risk of recurrence and metastases.

Source(s) of Support
Nil.

Conflict of Interest
None declared.

Acknowledgment
The authors would like to acknowledge Dr. Radhika Mhatre, DM, consultant pathologist, National Institute of Mental Health and Neuro-Sciences, Bengaluru.

References
9 Hoover JM, Bledsoe JM, Giannini C, Krauss WE. Intramedullary melanotic schwannoma. Rare Tumors 2012;4(01):e3
10 Alexiev BA, Chou PM, Jennings LJ. Pathology of melanotic schwannoma. Arch Pathol Lab Med 2018;142(12):1517–1523