

Pigmented neurofibroma: A case report of a rare entity

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ABSTRACT

Neurofibromas are benign peripheral nerve sheath tumors seen arising both sporadically and in patients with neurofibromatosis syndromes. Commonly they are of three types: localized, diffuse or plexiform. Pigmented neurofibromas are very rare, accounting to <1% of all neurofibromas reported. We present a case of a 64 year old woman with Neurofibromatosis 1, with a large swelling on the right thigh. The mass was grossly pigmented and microscopically diagnosed as pigmented neurofibroma.

Key words: Neurofibromatosis-1, pigmented neurofibroma, melanin pigment, Schwann cells

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Introduction

Pigmented neurofibromas are an unusual variant of neurofibroma containing melanin pigment in the cells. They are extremely rare and account for less than 1% of all neurofibromas reported in English Literature. These neoplasms are seen with patients of Neurofibromatosis 1 (NF1) syndrome. The brown pigment is generally not seen on gross examination and requires histopathological examination for its identification. ⁽¹⁾ We report a case of pigmented neurofibroma in a patient with NF1, with multiple neurofibromas.

Case report

A 64 yearold woman presented with a swelling in the right thigh of 3 months duration. The swelling had gradually increased in size and was associated with throbbing pain. On local examination a firm, tender 10 cm x 9 cm nodule was seen on the right thigh. The skin overlying the swelling was ulcerated and was discharging foul smelling pus. Patient was a known case of NF1, with café au lait spots

and multiple subcutaneous swellings all over her body. She had a history of left sided below knee amputation, 12 years back. Patient was a known hypertensive on treatment. Ultrasonography of the leg showed a large fairly defined hypoechoic pedunculated lesion arising from the subcutaneous plane of right thigh. Doppler showed increased vascularity-suggestive of neurofibroma. Multiple other similar lesions were noted in the right lower limb. An excision of the lesion along with an ellipse of skin was undertaken under general anesthesia and lesion sent for histopathological examination. Gross examination showed a skin covered soft tissue mass measuring 10 cm x 9 cm x 4 cm (Figure 1). Surface of the skin showed a large ulcer measuring 9.5 cm in diameter. Cut surface revealed a solid, firm, grey, glistening tumor involving skin and subcutis. Focal areas of brown pigmentation were visible throughout the tumor. Microscopy revealed ulcerated skin with granulation tissue and underlying tumor composed of randomly oriented thin spindled

cells with wavy bland nuclei. Clusters of cells showed intracytoplasmic melanin pigment. Mitotic count was low. Stroma showed thick and thin collagen strands with focal myxoid areas. The pigment was depigmented with melanin bleach and was negative for iron in Perls Prussian blue stain (Figure 2).



Figure 1. Gross. Solid, grey, glistening tumor with brownish black patches

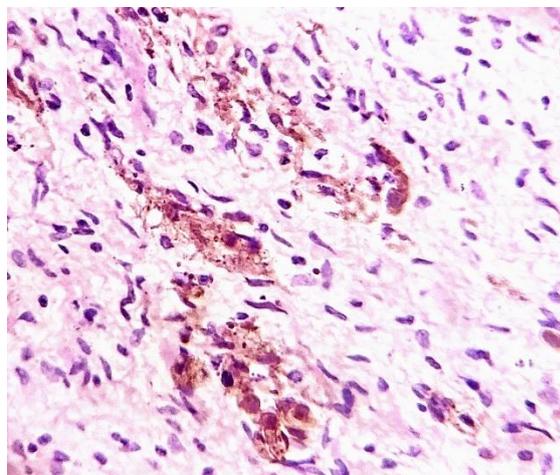


Figure 2. H&E. (40X) Bland spindle cells with wavy nuclei. Few cells show brown pigment in cytoplasm

Discussion

Histologically neurofibromas are composed of a mixture of cells, collagen and mucin. The cellular component consists of axons, Schwann cells, fibroblasts and (in plexiform type) perineural cells. The Schwann cells being the most predominant cells, have elongated, wavy,

serpentine nuclei with pointed ends. Scattered between the cells are wire-like strands of collagen which have an appearance of "shredded carrots". Small to moderate amounts of mucin is seen separating the cells and collagen along with few mast cells. ^[1]

Pigmented neurofibromas are extremely rare lesions and account for less than 1% of all neurofibromas reported in the years 1970 to 1966, recorded in the soft tissue registry of Armed Forces Institute of Pathology. ^[2] Neurofibromas may take three forms: localized, diffuse and plexiform. Pigmented neurofibromas are of the diffuse type and contain epithelioid cells. ^[1] The pigment distribution is characteristically seen in the deep dermis and subcutis. ^[3] The pigment in pigmented neurofibroma can be explained on the basis of embryonic relationship between Schwann cells and melanocytes. ^[4]

Pigmented neurofibromas should be differentiated from the pigmented forms of dermatofibrosarcoma protuberans (Bednar tumor), blue nevi and melanotic schwannoma. The pigmented forms of dermatofibrosarcoma protuberans (Bednar tumor), was earlier referred to as a "storiform pigmented neurofibroma". The uniform fibroblastic cells, extensive storiform pattern, dendritic pigment cells in random distribution, greater immunoreactivity for CD34 and lack of a diffuse proliferation of S-100 protein –positive Schwann cells favor a diagnosis of dermatofibrosarcoma protuberans over pigmented neurofibroma. ^[5]

Desmoplastic malignant melanoma with its deceptive bland cells and wavy nuclei may mimic a pigmented neurofibroma. However, the presence of significant sun damage, atypical junctional melanocytic hyperplasia, presence of very long, hyperchromatic cells, a "packeted" pattern of growth, dense fibrosis and deep lymphoid aggregates are in favor of a melanoma. S-100 is positive in both entities and desmoplastic malignant melanoma is commonly not positive for HMB45 and Melan-A, so immunohistochemistry is of little benefit. ^[6]

The distinction between congenital pigmented nevi with neuroid features and pigmented neurofibroma is not well established. Absence component is in favor of a pigmented

neurofibroma.¹¹ Melan-A is strongly positive in the neurotized areas, whereas Melan-A stain is completely negative in neurofibromas. Immunohistochemically S-100 stains strongly and diffusely in the cells of the nevi, including the neurotized areas, whereas neurofibroma shows a distinctive, sharp, wavy pattern of S100 staining.¹⁶

Melanotic schwannoma is a very rare pigmented neural tumor associated with Carney's complex, which shows presence of myxomas, abnormal pigmentation, endocrine overactivity and other abnormalities.¹⁷ It occurs intracranially and it involves the posterior nerves in the spinal cord. Microscopically pigmented cells are larger and more epithelioid, nucleus shows open chromatin and very prominent nucleolus.¹³ In contrast to classical schwannomas, Antoni A and Antoni B areas and a distinct capsule are absent.¹⁸

In conclusion, pigmented neurofibroma is a rare variant of neurofibroma which should be differentiated from other pigmented tumors and requires recognition as a separate benign entity.

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Conflict of Interest

There is no Conflict of interest

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References

1. Benign tumors of peripheral nerves. In: Goldblum JR, Folpe AL and Weiss SW, editors. *Enzinger and Weiss's Soft Tissue Tumors*. 7th ed. (pp.804) Elsevier Saunders; 2020
2. Fetsch JF, Michal M, Mittinen M. Pigmented (melanotic) neurofibroma: a clinicopathologic and immunohistochemical analysis of 19 lesions from 17 patients. *Am J SurgPathol*. 2000 Mar;24(3):331-43.
3. Pigmented neurofibroma of the skin. Mahantappa H, Venugopal SB, Agarwal S. Pigmented neurofibroma of the skin. *Arch Med Health Sci* 2015;3:306-8.
4. Bird CC, Willis RA. The histogenesis of pigmented neurofibromas. *J Pathol* 1969, 97: 631-637.
5. Rodriguez FJ, Folpe AL, Giannini C, Perry A. Pathology of peripheral nerve sheath tumors: diagnostic overview and update on selected diagnostic problems. *Acta Neuropathol*. 2012 Mar; 123(3): 295–319.
6. Chen Y, Klonowski PW, Lind AC, Lu D. Differentiating neurotized melanocytic nevi from neurofibromas using Melan-A (MART-1) immunohistochemical stain. *Arch Pathol Lab Med*. 2012 Jul;136(7):810-5.
7. Vindhya MR, Elshimy G, Elhomsy G. Carney complex. *Arch Pathol Lab Med*. 2021 Jul 17 (2):12-16.
8. Keskin E, Ekmekci S, Oztekin O, Diniz G. Melanotic schwannomas are rarely seen pigmented tumors with unpredictable prognosis and challenging diagnosis. *Case reports in Pathology*, 2017 Jun;3(2):12-15