Co-expression of CD34 and h-caldesmon in a benign meningioma-like dermal neoplasm, a case report

Haitham Kussaibi
Pathology Department, Imam Abdulrahman bin Faisal University, Dammam, Saudi Arabia

Abstract

Meningioma-like dermal tumor with diffuse coexpression of CD34 and h-caldesmon is rarely reported. Herein, we report a case of a 58-years-old woman who complained of a solitary dome-shaped papule on the left hand. An ellipse of skin measuring 1 x 0.5 x 0.5 cm was excised and sent for histopathological evaluation. Upon sectioning, the specimen showed a whitish firm dermal nodule measuring 3 mm in its greatest dimension. Microscopic examination revealed a well-circumscribed barely encapsulated dermal lesion showing compact round whorled sheets formed of round to ovoid uniform cells with abundant pink cytoplasm. Occasional intranuclear vacuoles were seen. A minor capillary-sized vascular component was seen in the background. Immunohistochemical (IHC) study revealed a diffuse positivity of tumor cells to CD34 and h-caldesmon along with faint reaction to Smooth Muscle Actin (SMA) and ER. However, Desmin, S100, HMB45, EMA, Pan Cytokeratin, and Chromogranin were all negative. Ki67 was very low (1%). CD31 and Factor VIII were high-positive. The lesion described here represents a meningioma-like benign dermal tumor with diffuse coexpression of CD34 and h-caldesmon along with a focal expression of ER.

Case Report

A 58-years-old woman who complained of a solitary dome-shaped papule on the left hand. An ellipse of skin measuring 1 x 0.5 x 0.5 cm was excised and sent for histopathological examination. Upon sectioning, an underlying whitish firm dermal nodule measuring 3 mm in its greatest dimension was seen.

Microscopic examination revealed a well-circumscribed barely encapsulated dermal lesion forming compact proliferation of round to ovoid cells arranged in round solid sheets surrounded, peripherally, by some nerves and vessels. Tumor cells were almost uniform with abundant pink cytoplasm. Occasional intracytoplasmic vacuoles were seen. Nucleoli were inconspicuous. No mitotic figures were seen (Figure 1).

IHC stains were performed on formalin-fixed paraffin-embedded tissue with proper representative sections. The IHC study revealed a diffuse positivity of tumor cells to CD34 and h-caldesmon with a faint reaction to SMA and ER. However, Desmin, S100, HMB45, Pan Cytokeratin, and Chromogranin were all negative. Ki67 was very low (1%). CD31 and Factor VIII highlighted the vascular background (Figure 2).

Discussion

The lesion described here represents a meningioma-like dermal tumor with a co-expression of CD34 and h-caldesmon. The main differential diagnoses are cutaneous meningioma and glomus tumors family.

While the current lesion is morphologically reminiscent of cutaneous meningioma; neither the location nor the IHC stains support that diagnosis. Cutaneous meningioma is usually seen in the scalp and is believed to originate from a rudimentary meningocele. Furthermore, CD34 expression along with the absence of EMA and PR expression make that diagnosis less likely in the current case.

Although, tumors of the glomus family are highly suggestive here, the location, the compact nature of the proliferation, and the diffuse positivity of CD34 are all unusual in such entities. However, CD34 focal expression was reported in Glomus tumors throughout the body. Keeping in mind the minor vascular component formed of capillary-sized vessels; solid glomus tumor has a close growth pattern to the current case.
Furthermore, ER was reported to be positive in glomangiomyoma of the vagina among other organs in women. Other differential diagnoses were suggested in the current case. However, none of them did fit with the histology and IHC here. Meningioma-like tumor of the skin usually showed a whorled spindle cell proliferation, focally perivascular, with an IHC reaction to CD34 but not muscular markers. One of the reported MLTS showed a deciduoid appearance like the current case. However, h-caldesmon was positive in the tumor here.

Polyoid dermal hemangiopericytoma looks like the present case in many aspects including lobulation and perivascular arrangement. However, a staghorn pattern of vascular channels, characteristic to hemangiopericytoma, was not seen here. Furthermore, CD34 expression is very unusual in hemangiopericytoma.

Cellular neurothekeoma, a rare entity, has a marked resemblance to what we described herein, except for the myxoid matrix, and the diffuse positivity of CD34 which had not previously been described in neurothekeoma.

Conclusions

Accordingly, the most likely diagnosis of the present lesion is within the spectrum of glomus tumors that unusually showed diffuse expression of CD34. However, other differential diagnoses still cannot be excluded.

References

1. Barr RJ, Yi ES, Jensen JL, Wuerker RB, Liao SY. Meningioma-like tumor of the skin. An ultrastructural and immunohis-tochemical study. Am J Surg Pathol 1993;17:779-87.
2. Monteagudo C, Jiménez AI, Arnandis A, Barr RJ. Meningioma-like Tumor of the Skin Revisited: A Distinct CD34+ Dermal Tumor With an Expanded Histologic Spectrum. Am J Surg Pathol 2019;43:1518-25.
3. Lee DW, Yang JH, Chang S, Won CH, Lee MW, Choi JH, et al. Clinical and pathological characteristics of extradigital and digital glomus tumours: a retrospective comparative study. J Eur Acad Dermatol Venereol 2011;25:1392-7.
4. Mravic M, LaChaud G, Nguyen A, Scott MA, Dry SM, James AW. Clinical and histopathological diagnosis of glomus tumors: an institutional experience of 138 cases. Int J Surg Pathol 2015;23:181-8.
5. Howitt BE, Fletcher CD. Mammary-type Myofibroblastoma: Clinicopathologic Characterization in a Series of 143 Cases. Am J Surg Pathol 2016;40:361-7.
6. Kishore M, Kaushal M, Bhardwaj M, Sharma N. Cutaneous Meningioma: A Cytomorphological Diagnosis. Indian Dermatol Online J 2017;8:201-4.
7. Choi JH, Ro JY. Epithelioid Cutaneous

Figure 1. A) 5X Microscopic image (H&E stains): Well-circumscribed dermal lesion with scattered vessels and nerves at the periphery, B) 10X Microscopic images (H&E stains): Lesion reveals a compact whorled lobulated growth pattern with a minor capillary-sized vascular background, C and D) 40X Microscopic images (H&E stains): Tumor cells have abundant eosinophilic cytoplasm with bland-looking round, ovoid, focally spindled nuclei with focal nuclear inclusions. No mitosis or necrosis was seen.

Figure 2. The tumor is diffusely positive for CD34 and h-caldesmon, faintly positive for SMA and ER, and negative for Desmin and S100; Ki67 is very low (1%); CD31 and Factor VIII highlight the vascular background.
8. Mentzel T, Hugel H, Kutzner H. CD34-positive glomus tumor: clinicopathologic and immunohistochemical analysis of six cases with myxoid stromal changes. J Cutan Pathol 2002;29:421-5.

9. Xu YY, Luo XM, Zhou SH, Zheng ZJ. CD34-positive expression in benign nasal glomus tumour: two case reports and a literature review. J Int Med Res 2010;38:2169-77.

10. Rahimi S, Marani C, Balega J, Hirschowitz L. Glomangiomyoma of the Vagina: A Report of 2 Cases and Literature Review. Int J Gynecol Pathol 2017;36:334-8.

11. Pollock AM, Sweeney EC. Polypoid dermal hemangiopericytoma: a case report. Am J Dermatopathol 1998;20: 506-8.

12. Kao EY, Kernig ML. Neurothekeoma. StatPearls, Treasure Island (FL), 2020.