



TITLE

Purely intradermal atypical spindle cell/pleomorphic lipomatous tumor

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tumor

I have read with a lot of interest the recent article of Boyd ¹ reporting on an atypical pleomorphic lipomatous tumor arising on the cheek and I would like to make a few additional remarks. In my view, **purely intradermal** atypical pleomorphic lipomatous tumors (also called ‘atypical spindle cell/pleomorphic lipomatous tumors’ (ASPLT) to emphasize the major overlap with the recently characterized atypical spindle cell lipomatous tumors, which I believe to belong to the same clinicopathologic and molecular spectrum ²) are extremely uncommon, and most of the cases of purely intradermal adipocytic lesions with spindle/pleomorphic cell features I have seen in consultation, were found to be rather compatible with intradermal spindle cell/pleomorphic lipomas. Important to mention is that intradermal spindle cell/pleomorphic lipomas differ from subcutaneous spindle cell/pleomorphic lipomas, being uncapsulated with poorly defined infiltrative margins and having a wider anatomical distribution. ^{3,4} This latter characteristics can therefore not be used to distinguish an ASPLT from a spindle cell/pleomorphic lipoma in the case of a purely dermal location. On the other hand, additional atypical morphologic features as nicely described in this case by Boyd (including the atypical hyperchromatic spindled and multinucleated ‘bizarre’ cells and the (atypical) mitotic figures) are diagnostic for ASPLT and are not consistent with a histological diagnosis of a classical spindle cell/pleomorphic lipoma. ^{5,6} The exact clinicopathologic meaning of (atypical) mitoses as the only atypical morphologic feature in the spectrum of adipocytic tumors with spindle cell/pleomorphic features is still the subject of much debate and remains to be elucidated in further studies. In my view, classical spindle cell/pleomorphic lipoma should always be

diagnosed with some caution if (atypical) mitoses are seen. Nevertheless, since the publications of 2018^{5,6}, I have signed out consultation cases of otherwise classical spindle cell/pleomorphic lipoma showing (atypical) mitotic figures. So, from these recent personal findings, (atypical) mitoses could be rarely observed in otherwise classical spindle cell/pleomorphic lipomas provided that there is in these cases complete absence of other atypical features (e.g. absence of atypical hyperchromatic spindled and multinucleated, pleomorphic, 'bizarre' cells; absence of pleomorphic univacuolated and plurivacuolated lipoblasts).

Given the wide variety of microscopic appearances of ASPLTs (depending on the varying cellularity, the variable amounts of the spindle cells, adipocytes, lipoblasts and pleomorphic cells, and on the heterogenous aspect of the extracellular matrix)² and the histologic overlap with diverse mimics, the diagnosis of ASPLT can be challenging. In my view, the atypical lipomatous tumor (ALT), dedifferentiated liposarcoma (DDLs) and pleomorphic liposarcoma (PLS) (besides the spindle cell/pleomorphic lipoma already described above) are the most important differential diagnoses in the spectrum of (atypical) adipocytic tumors with spindle cell and pleomorphic features. ASPLT can show some histomorphologic characteristics in common with ALT and DDLs (atypical stromal cells and lipoblasts; variation in adipocytic size and shape; and collagenous stroma). Immunohistochemistry for MDM2 and CDK4, and/or *MDM2* FISH can be performed to resolve this important differential diagnoses.² PLS typically presents in the deep soft tissues and rarely arises in the subcutis (unlike ASPLT), the dermis representing an exceptionally rare site of presentation.^{7,8} I disagree further with the statement of Boyd that the histomorphologic features of atypical pleomorphic lipomatous tumors are akin to those of pleomorphic liposarcomas. In spite of overlapping clinicopathologic and molecular

features (eg, infiltrative growth, pleomorphic lipoblasts, and loss of *RBI* and its flanking genes *RCBTB2*, *ITM2B*, and *DLEU1*), PLS can be differentiated by a more pronounced pleomorphism, a more noticeable mitotic activity, and necrosis. Moreover, the presence of a pleomorphic lipoma-like component, composed of ropey collagen and floret-like multinucleated cells, is a specific feature of ASPLT, not present in PLS.²

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References:

1. Boyd AS. An atypical pleomorphic lipomatous tumor arising on the cheek. *J Cutan Pathol* 2019. Epub ahead of print. Doi:10.1111/cup.13540
2. Creytens D, Mentzel T, Ferdinande L, Lecoutere E, et al. “Atypical” pleomorphic lipomatous tumor. A clinicopathologic, immunohistochemical and molecular study of 21 cases, emphasizing its relationship to atypical spindle cell lipomatous tumor and suggesting a morphologic spectrum (atypical spindle cell/pleomorphic lipomatous tumor). *Am J Surg Pathol* 2017;41:1443-1455.
3. French CA, Mentzel, Kutzner H, Fletcher CD. Intra-dermal spindle cell/pleomorphic lipoma: a distinct subset. *Am J Dermatopathol* 2000;22(6):496-502.

4. Reis-Filho JS, Milanezi F, Soares MF, Fillus-Neto J, Schmitt FC. Intradermal spindle cell/pleomorphic lipoma of the vulva: case report and review of the literature. *J Cutan Pathol* 2002;29(1):59-62.
5. Creytens D, Mentzel T, Ferdinande L, et al. U. Atypical multivacuolated lipoblasts and atypical mitoses are not compatible with the diagnosis of spindle cell/pleomorphic lipoma. *Hum Pathol* 2018;74:188-189.
6. Creytens D, Mentzel T, Ferdinande L, et al. Atypical mitoses are present in otherwise classical pleomorphic lipomas-reply. *Hum Pathol* 2018;81:300-302
7. Val-Bernal JF, Gonzalez-Vela MC, Cuevas J. Primary purely intradermal pleomorphic liposarcoma. *J Cutan Pathol* 2003;30:516-520.
8. Gardner JM, Dandekar M, Thomas D, et al. Cutaneous and subcutaneous pleomorphic liposarcoma. *Am J Surg Pathol* 2012;36:1047-1051.