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Annual Meeting #ASDP25

November 6-9, 2025
Hilton Baltimore Inner Harbor **Baltimore, MD, USA**

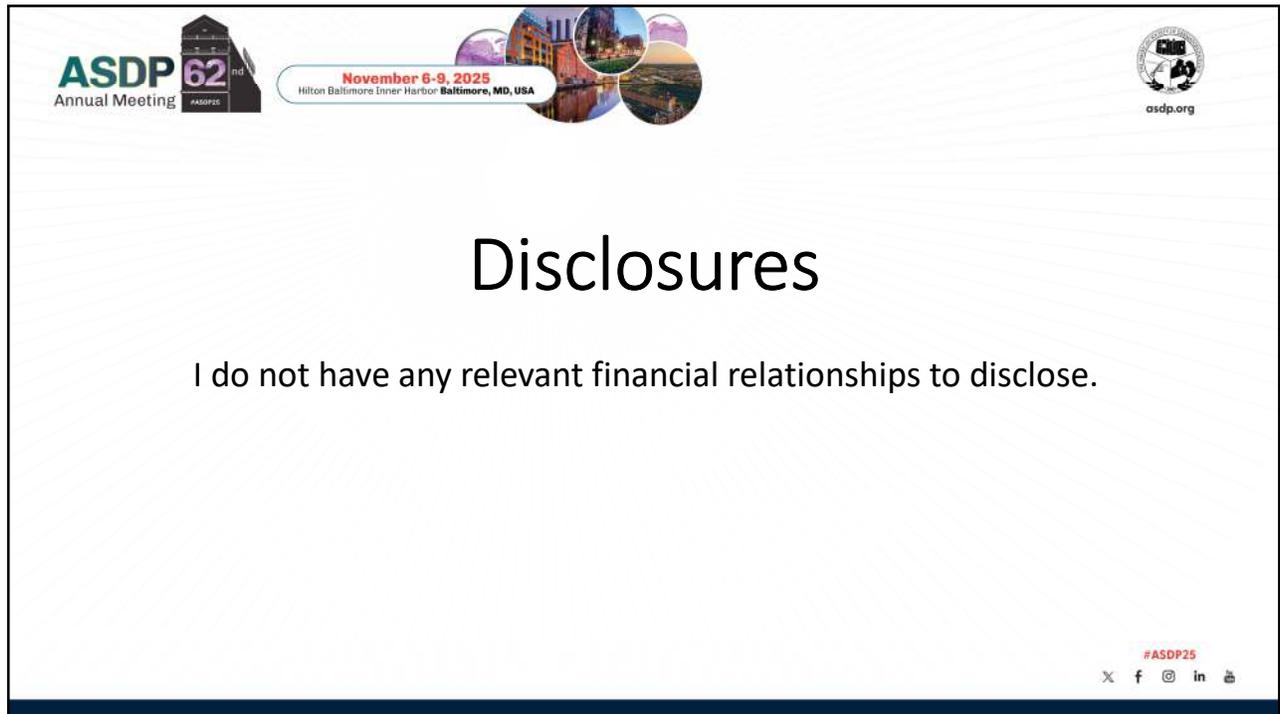
Superficial ALK-Rearranged Myxoid Spindle Cell Neoplasm: Histopathologic Findings in Two Cases

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Disclosures

I do not have any relevant financial relationships to disclose.

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Background

- Superficial ALK-Rearranged Myxoid Spindle Cell Neoplasm (SAMS)
- Novel receptor tyrosine kinase-fusion mesenchymal tumor
- CD34 and S100 protein co-expression
- Bland ovoid-to-spindle cells arranged in whorls within a fibromyxoid stroma.
 - First described in 2021 (6 cases) by *Dermawan et al.*

Dermawan et al., 2021

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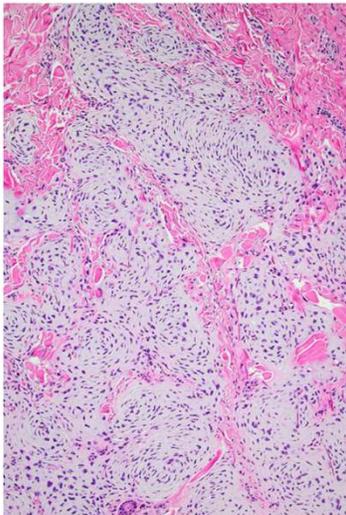
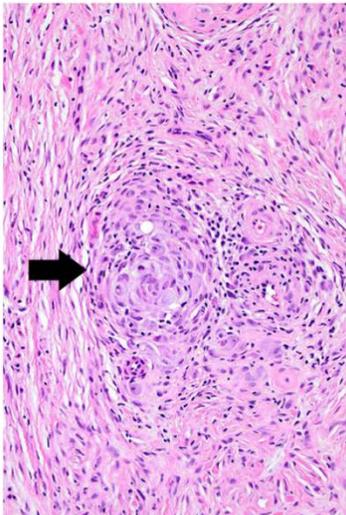
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DeSimone et al., 2024

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Background

- M:F equal distribution
- Lower extremity (71%), upper extremity (14%), trunk (9%), and face (6%)
- Dermis (32 tumors; 91%) vs subcutis (3; 8%); or can extended to the subcutis

DeSimone et al., 2024

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Background

- Benign behavior
 - No evidence of metastasis so far
 - One incompletely resected tumor recurred at 19 months

DeSimone et al., 2024

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Background

TABLE 2. Histopathologic Features

Histologic parameter	No. present, n/N (%)
Myxoid stroma	35/35 (100)
Spindle cell morphology	35/35 (100)
Dermal involvement	32/35 (91)
Epithelioid morphology	26/35 (74)
Epidermal collarette	19/30 (63)
Subcutis involvement	11/19 (58)
Hyalinized vessels	20/35 (57)
Amianthoid collagen	14/35 (40)
Metaplastic ossification	2/35 (6)
Lipofibromatosis-like	1/35 (3)
Ulceration	1/32 (3)
Mitotic index (> 1 per 10 HPE ²)	0/35 (0)
Necrosis	0/35 (0)

DeSimone et al., 2024

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Background

TABLE 3. Immunohistochemical Characteristics

Immunohistochemical stain	No. positive*, n/N (%)
ALK	24/31 (77)
CD34	15/21 (71)
EMA	17/28 (61)
S-100	9/32 (28)
SMA	5/20 (25)
SOX10	0/8 (0)
Desmin	0/7 (0)

*At least focal expression.

DeSimone et al., 2024

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Background

- SAMS has morphologic and molecular overlaps with epithelioid fibroid histiocytoma (EFH)
- “Myxoid spindle cell variant of epithelioid fibrous histiocytoma”

DeSimone et al., 2024

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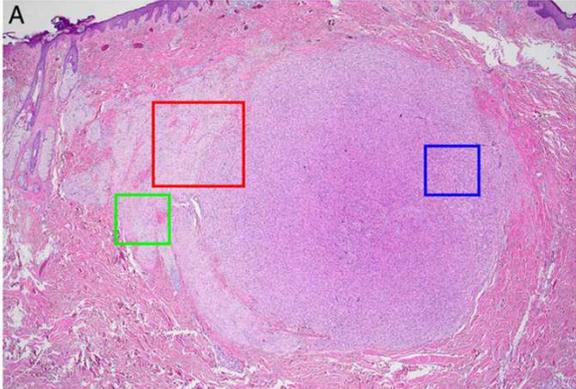


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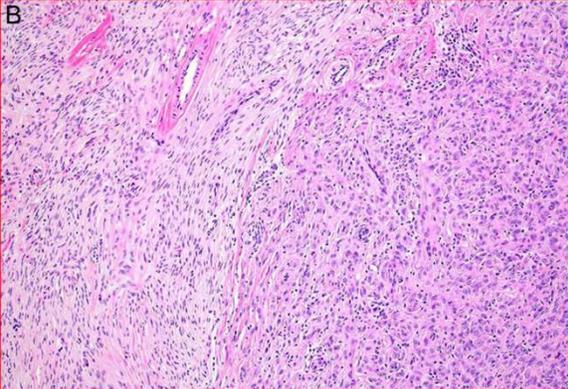


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A



B



DeSimone et al., 2024

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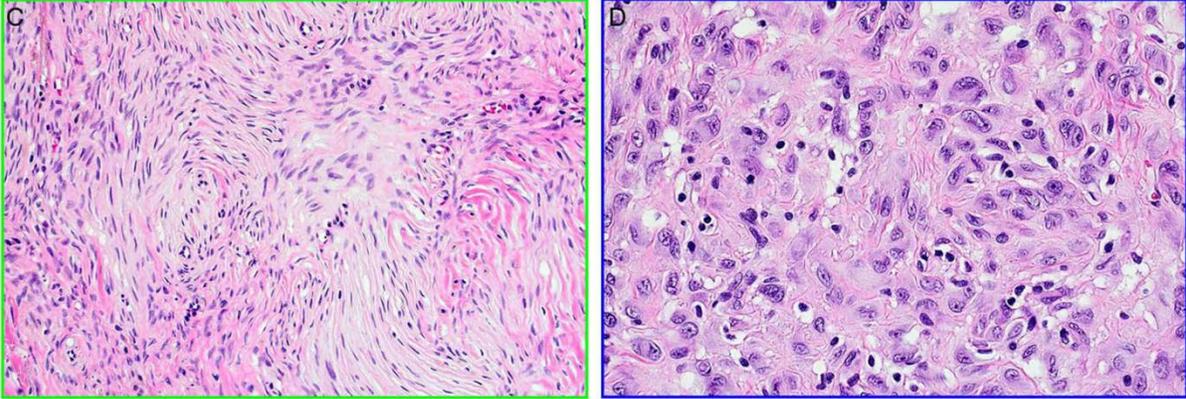


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Case #1

- An 82-year-old female presented with a lesion located in her mid-back

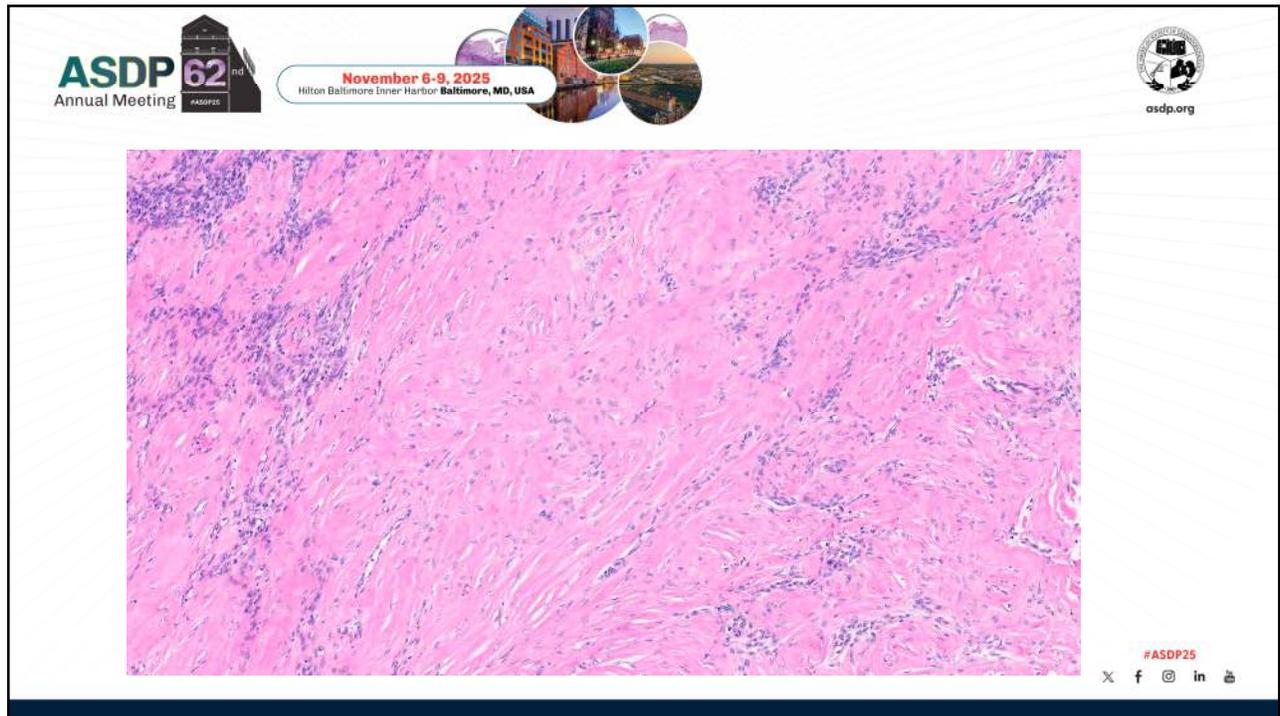
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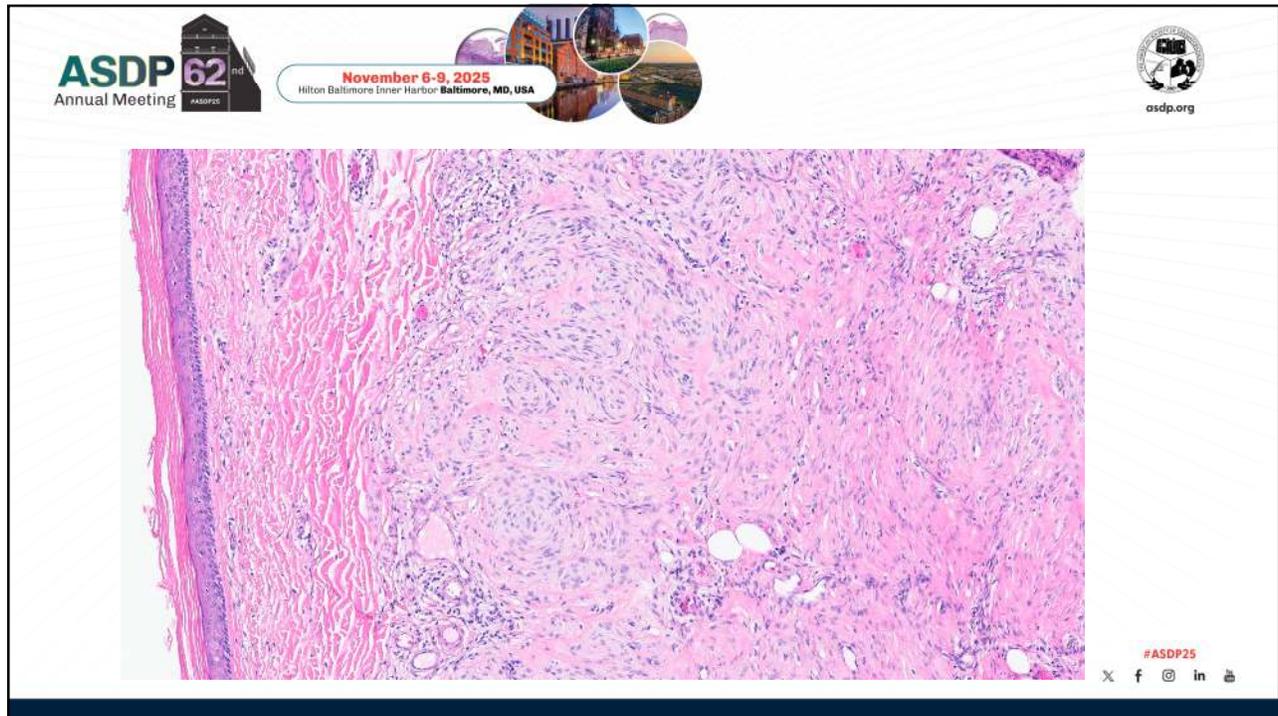
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Case #1: Immunohistochemistry

POSITIVE	NEGATIVE
ALK (diffuse)	Panckeratin (AE1/AE3)
CD34 (strong, diffuse)	CD31
S100 protein (focal)	SMA
	Desmin
	SOX10
	CD63

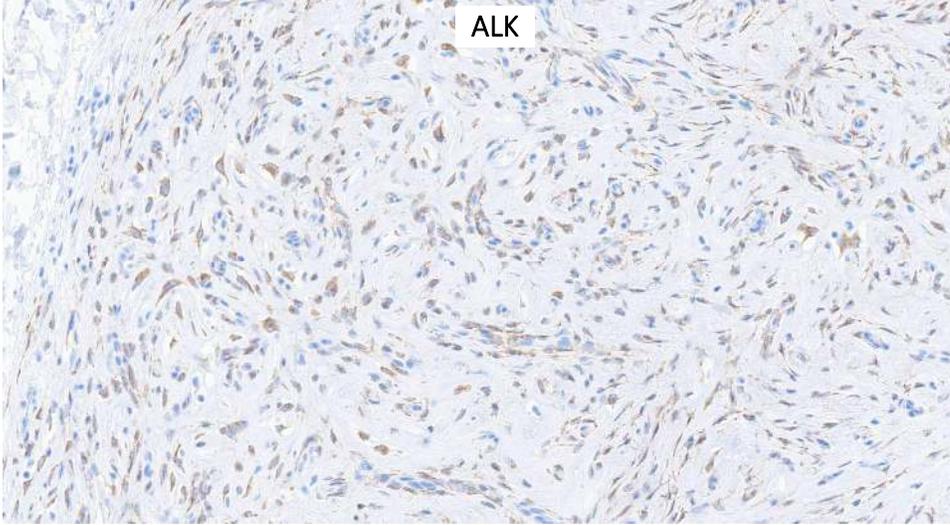
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ALK



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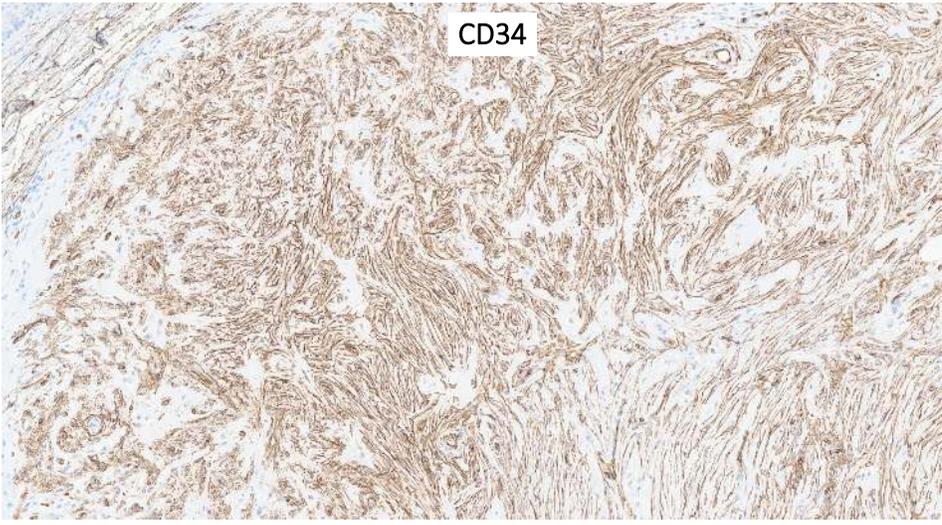
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CD34



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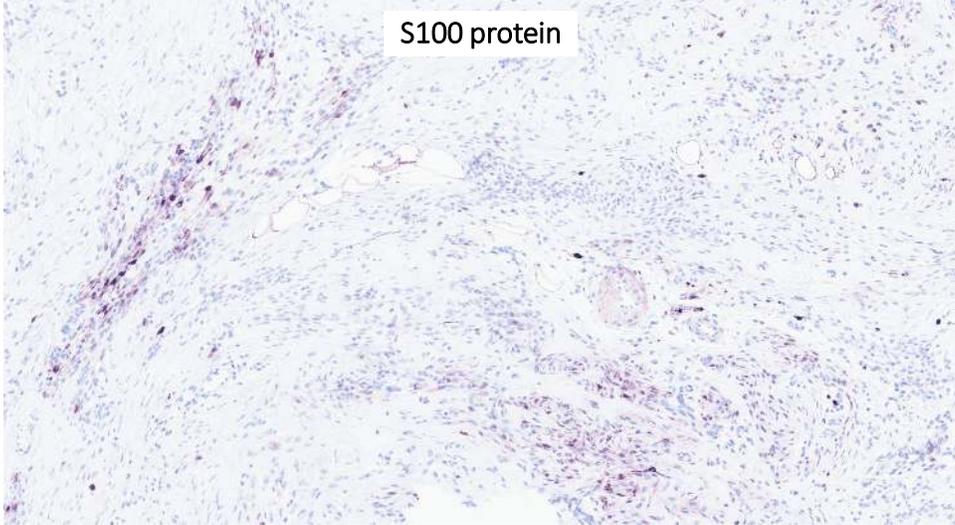
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S100 protein



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Detailed description: This slide features a central microscopic image of tissue stained for S100 protein. The image shows a dense population of cells with purple nuclei and pink cytoplasm/extracellular matrix. A white box with the text 'S100 protein' is overlaid on the image. The slide is framed by a header containing the ASDP 62nd Annual Meeting logo, dates (November 6-9, 2025), location (Hilton Baltimore Inner Harbor, Baltimore, MD, USA), and the ASDP logo with website (asdp.org). A social media bar at the bottom right includes the hashtag #ASDP25 and icons for X, Facebook, Instagram, LinkedIn, and YouTube.

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Case #1: Molecular

- NGS-targeted fusion panel
- *FXR1::ALK* fusion
- Previously reported fusion by DeSimone, et al., 2024.

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Detailed description: This slide is a text-based presentation slide. It features a header with the ASDP 62nd Annual Meeting logo, dates (November 6-9, 2025), location (Hilton Baltimore Inner Harbor, Baltimore, MD, USA), and the ASDP logo with website (asdp.org). The main content is titled 'Case #1: Molecular' and lists three bullet points: 'NGS-targeted fusion panel', '*FXR1::ALK* fusion', and 'Previously reported fusion by DeSimone, et al., 2024.'. A social media bar at the bottom right includes the hashtag #ASDP25 and icons for X, Facebook, Instagram, LinkedIn, and YouTube.

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Follow-Up

- 3-month follow-up showed no evidence of recurrence

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Case #2

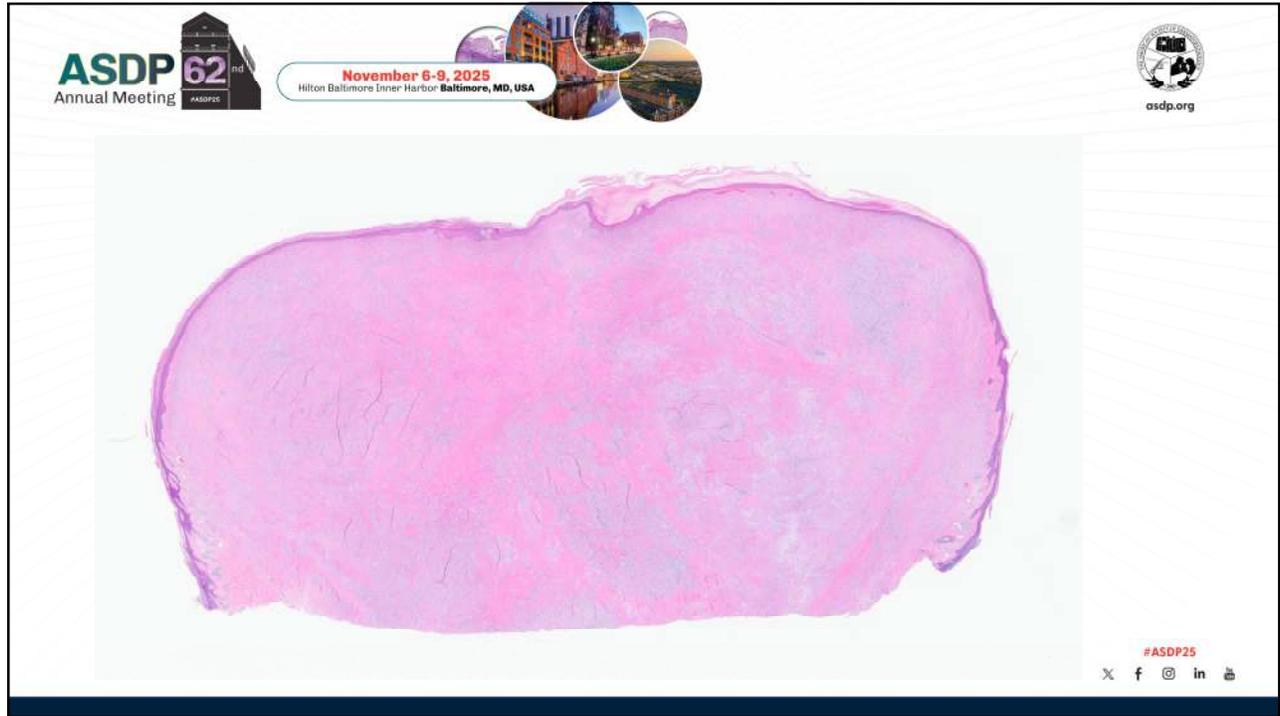
- A 67-year-old male presented with a mass in the left thigh

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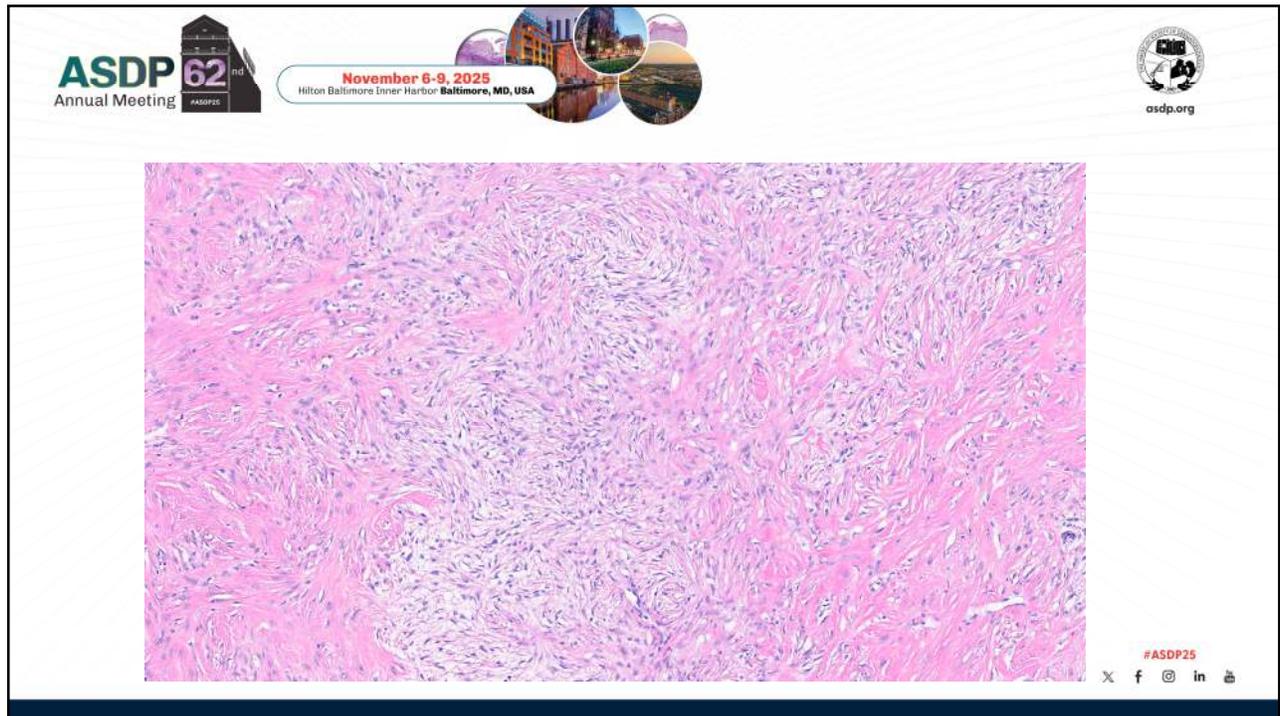


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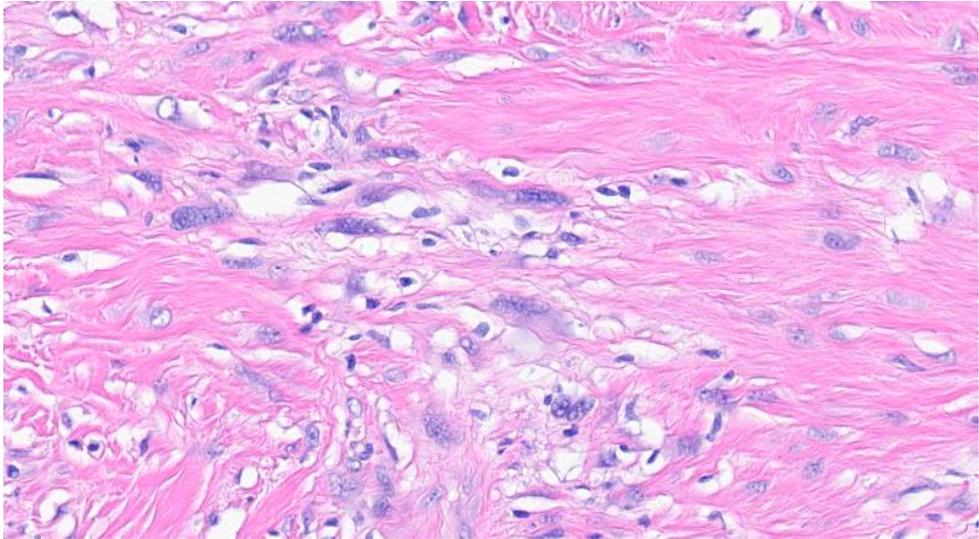


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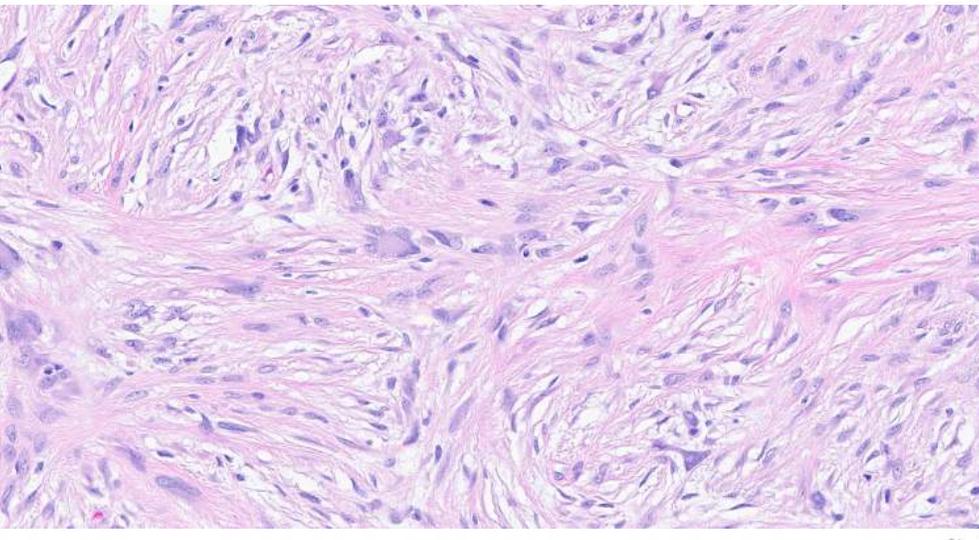
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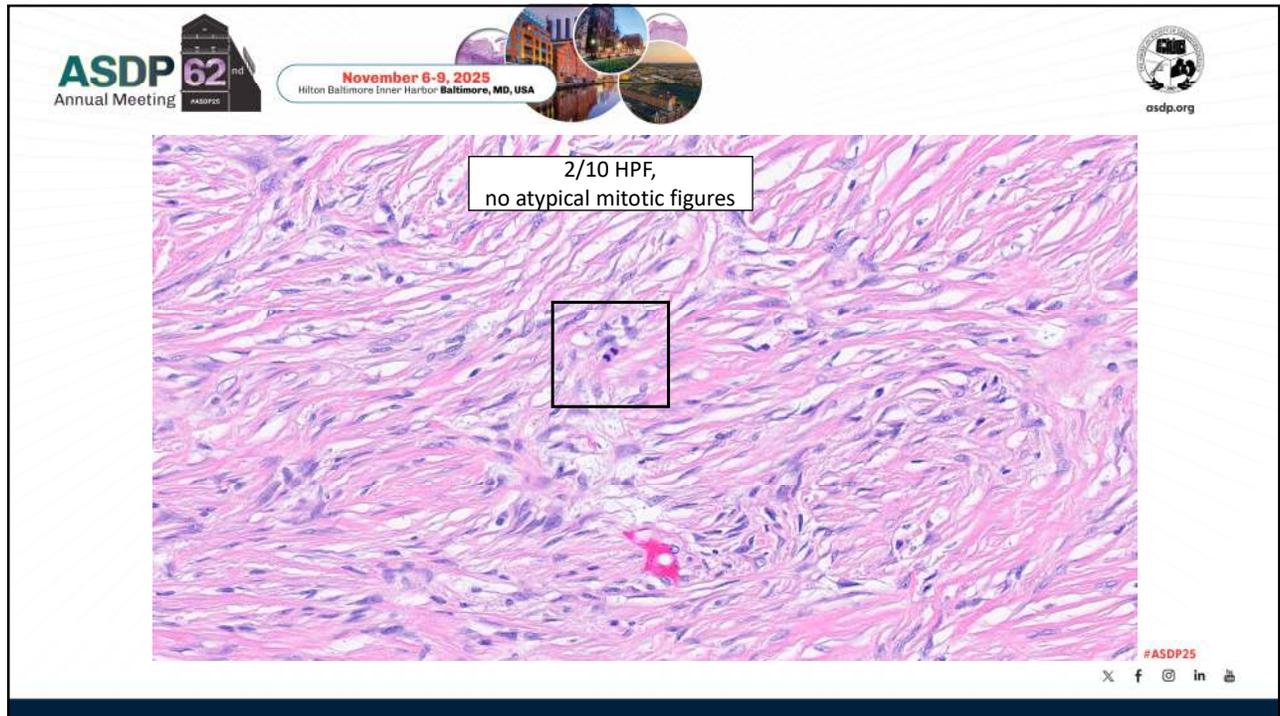
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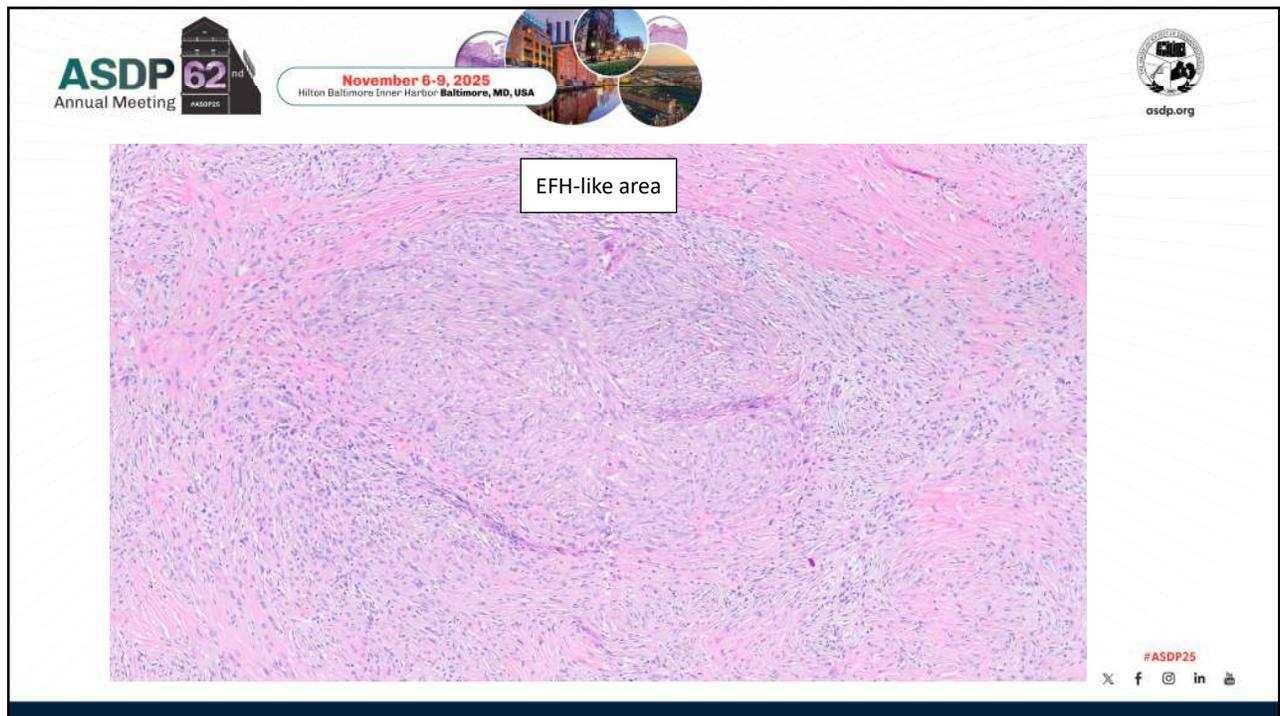
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Case #2: Immunohistochemistry

POSITIVE	NEGATIVE
ALK (diffuse, stronger in epithelioid area)	Pankeratin (AE1/AE3/PCK26)
S100 protein (strong, diffuse)	CK CAM5.2
CD10 (diffuse, stronger in epithelioid area)	CD34
Factor XIII A (diffuse)	SOX10
SMA (rare cells)	EMA
	Desmin

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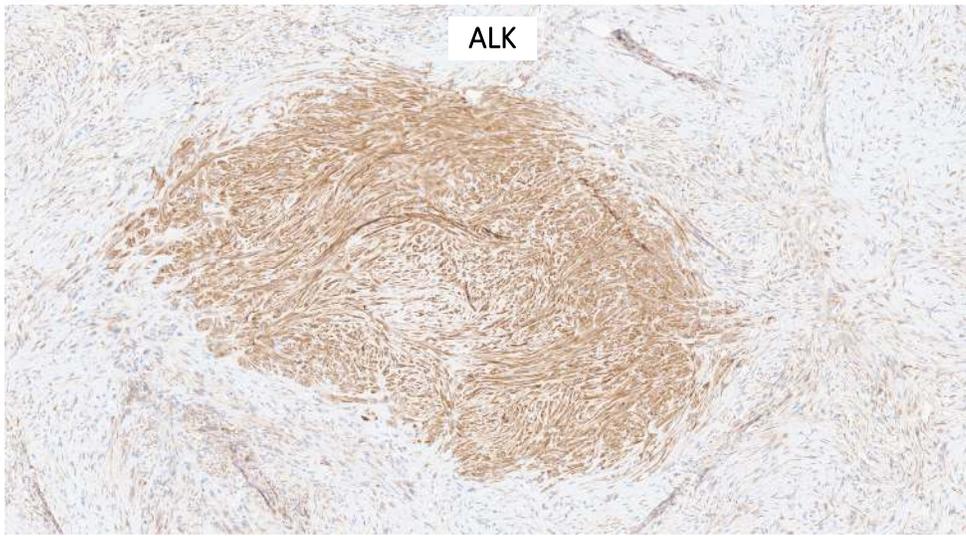
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ALK



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CD34



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Detailed description: This is a histological slide showing immunohistochemical staining for CD34. The tissue consists of a dense population of spindle-shaped cells arranged in interlacing fascicles. The cells exhibit brown cytoplasmic and nuclear staining, indicating a positive result for CD34. The background is counterstained with hematoxylin, showing blue nuclei. The overall architecture is characteristic of a spindle cell neoplasm.

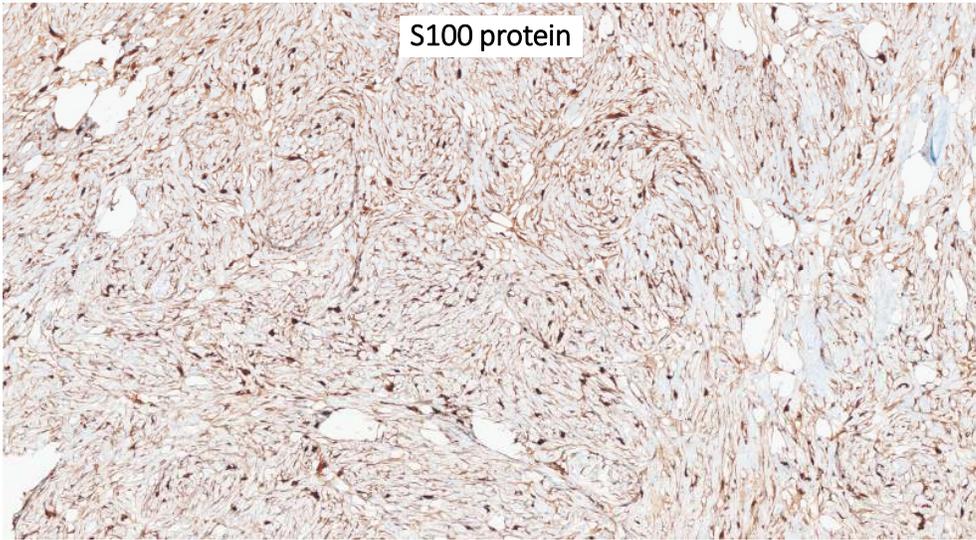
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S100 protein



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Detailed description: This is a histological slide showing immunohistochemical staining for S100 protein. The tissue shows spindle-shaped cells in fascicles, similar to the CD34 slide. The cells are stained brown, indicating a positive result for S100 protein. The staining is more intense and widespread than in the CD34 slide. The hematoxylin counterstain is visible, highlighting the nuclei of the cells.

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Case #2: Molecular

- NGS targeted fusion panel
- *LRRFIP1* ::*ALK* fusion
- Previously described in inflammatory myofibroblastic tumor (IMT) but not in SAMS

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Follow-Up

- Follow-up data was not present

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Conclusions

- SAMS likely represents a histological variant of EFH
- CD34 and S100 protein co-expression is common but not in all tumors
- Moderate atypia is exceedingly rare
 - The significance is unknown
- *LRRFIP1::ALK* is a novel fusion in SAMS

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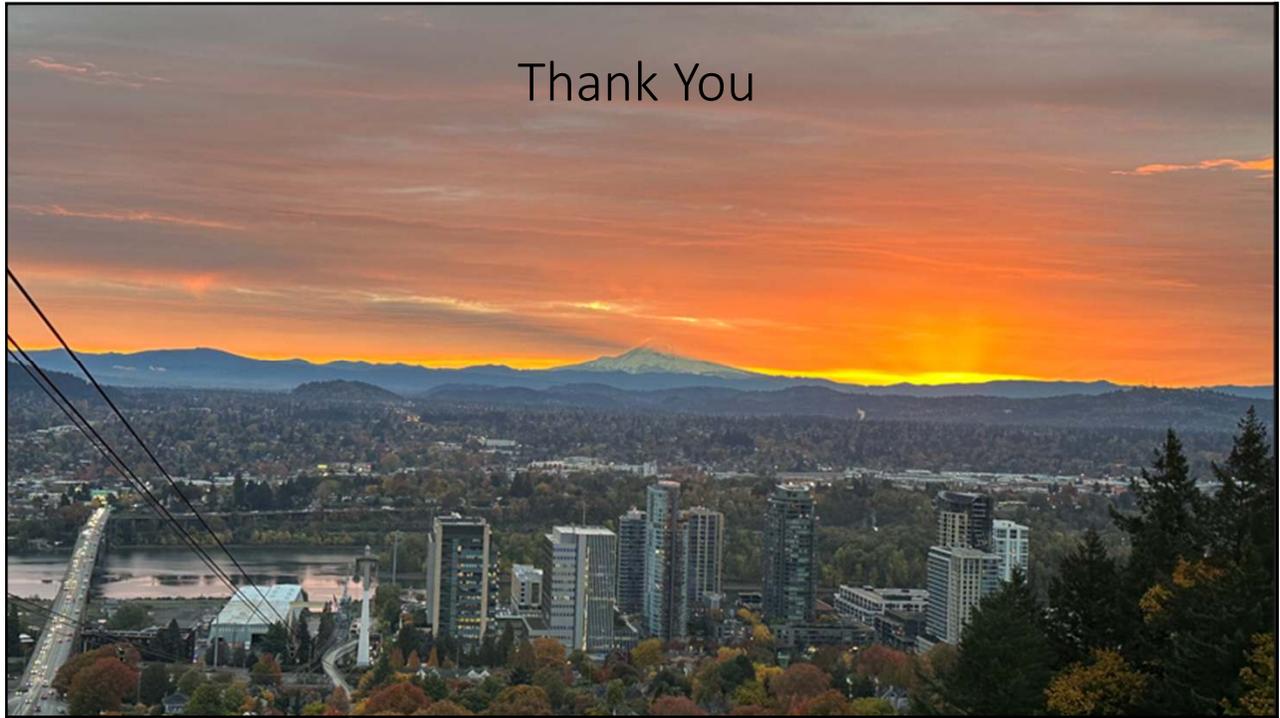
References

- Dermawan JK, Azzato EM, Goldblum JR, Rubin BP, Billings SD, Ko JS. Superficial ALK-rearranged myxoid spindle cell neoplasm: a cutaneous soft tissue tumor with distinctive morphology and immunophenotypic profile. *Modern Pathology*. 2021;34(9):1710-1718. doi:[10.1038/s41379-021-00830-w](https://doi.org/10.1038/s41379-021-00830-w)
- Kasago I, Aypar U, Sukhadia P, et al. A novel case of cutaneous myxoid spindle cell neoplasm with *FMR1-ALK* gene fusion and CD34/S100 co-expression. *J Cutan Pathol*. 2023;50(6):505-510. doi:[10.1111/cup.14354](https://doi.org/10.1111/cup.14354)
- DeSimone MS, Odintsov I, Tsai HK, et al. Epithelioid Fibrous Histiocytoma Is on a Continuum With Superficial ALK-rearranged Myxoid Spindle Cell Neoplasm: A Clinicopathologic Series of 35 Cases Including Alternate RET and NTRK3 Fusions. *American Journal of Surgical Pathology*. 2024;48(12):1568-1579. doi:[10.1097/pas.0000000000002315](https://doi.org/10.1097/pas.0000000000002315)
- Suurmeijer AJH, Dickson BC, Swanson D, et al. A novel group of spindle cell tumors defined by S100 and CD34 co-expression shows recurrent fusions involving RAF1, BRAF, and NTRK1/2 genes. *Genes, Chromosomes and Cancer*. 2018;57(12):611-621. doi:[10.1002/gcc.22671](https://doi.org/10.1002/gcc.22671)

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