PATIENT	REPORT DATE	BOOKING ID
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Anaplastic Lymphoma Kinase-1 Immunohistochemistry

Test Description

Anaplastic lymphoma kinase (ALK) is a receptor tyrosine kinase of the insulin receptor superfamily. *ALK* gene rearrangements were first discovered in NSCLC in 2007 by Soda et al. who identified that the 3′ end of *ALK* was juxtaposed to the 5′ end of echinoderm microtubule- associated protein-like 4 (*EML4*) gene attributable to an inversion within chromosome 2p. The most common *ALK* rearrangement is fusion of its 3′ kinase domain with truncated portions of the (N-terminal) echinoderm microtubule-associated protein-like 4 (*EML4*) gene as a result of inversion within the short arm of chromosome 2. Assessment of EML4-ALK gene rearrangement/ALK protein expression in advanced stages of lung cancer has become standard of care for the management of advanced NSCLC patients. ALK may also be amplified through mutation, as in neuroblastomas. Various solid tumors, such as non-small cell lung carcinoma (NSCLC) and brain cancers were also found to aberrantly express ALK.

Specimen

Sample Type: FFPE block 3196/19A
Site: Mediastinal Lymph Node
Pathology ID: MOLQ/IHC-18042019
Disease: History of endometrial cancer

Interpretation

Positive: Strong, brown, granular cytoplasmic staining.
Negative: Absence of strong granular cytoplasmic staining.
Scoring: (Intensity)
0: Negative, 1+: Weak Staining, 2+: Moderate Staining, 3+: Strong Staining.
H Score: Intensity x % of Tumor cells stained positive
Range: 0-300 (3+ as the cut-off for positivity)

Methodology

Immunostaining for Alk protein was done using PathnSitu Rabbit Anti-Human Alk monoclonal (Clone EP302) antibody (#PR224)

Note

A potentially better assay to select patients to receive an ALK inhibitor is one that detects ALK expression at the protein level. This assay would then allow one to verify that the actual protein target of the inhibitor, that is, the ATP-binding pocket in the kinase domain of ALK, is present, alleviate any concern about unproductive ligation after rearrangement, and detect any expression mediated by any other aberrant non-rearrangement mechanism. ALK is not normally expressed in the lung and any expression would be considered abnormal.

References

1. Rosai and Ackerman's Surgical Pathology.
2. Biomarkers for ALK and ROS1 in Lung Cancer: Immunohistochemistry and Fluorescent In Situ Hybridization Peter P. Luk et al. Archives of Pathology & Laboratory Medicine 2018 142(8).
3. Immunohistochemistry for predictive biomarkers in non-small cell lung cancer Mari Mino-Kenudson Transl Lung Cancer Res. 2017 Oct; 6(5).
4. Anaplastic lymphoma kinase status in lung cancers: An immunohistochemistry and fluorescence *in situ* hybridization study from a tertiary cancer center in India. SS Murthy et al. Indian Journal of Cancer 2017 54(1).
5. ALK Immunohistochemistry in NSCLC: Discordant Staining Can Impact Patient Treatment Regimen Merdollbrahim et al. Journal of Thoracic Oncology 2016 11:12

Anaplastic Lymphoma Kinase (Alk-1): Negative

Microscopy Evaluation

Tumor cells: 90%

Tumor cells positive for Alk: 02% (1+ Weak Staining)
H SCORE: 02%

ALK IHC - Tumor

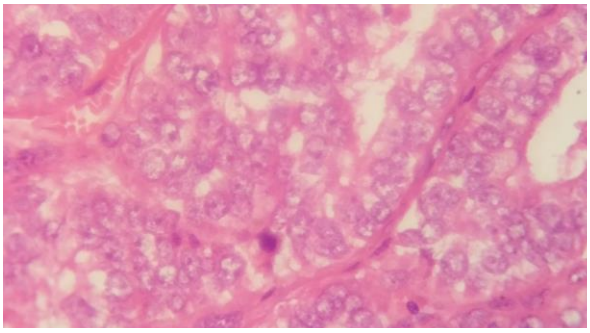

Figure 1

ALK IHC- Tumor Cells

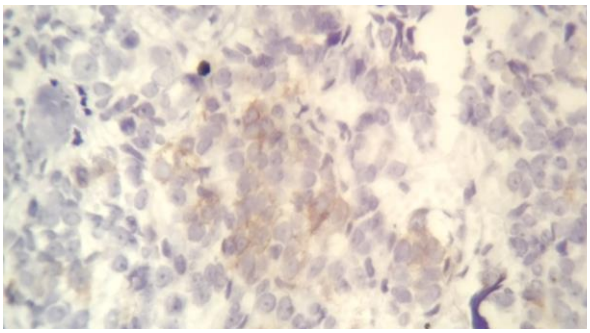

Figure 2

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ALK-1 IHC