

Leukemia and Hematologic Oncology 2018 - Correlation of histomorphology and immunohistochemistry in histiocytic and dendritic cell neoplasms: A retrospective observational study of three years in a referral laboratory in India

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Background: Histiocytic and dendritic cell neoplasms (HDCN) are rare disorders of lymph node and soft tissue. These neoplasms include histiocytic sarcoma (HS), langerhans cell histiocytosis (LCH), follicular dendritic cell sarcoma (FDSC), interdigitating cell sarcoma (IDCS), indeterminate cell sarcoma (INDCS), and fibroblastic reticular cell tumor (FRCT). These neoplasms are often misdiagnosed as carcinoma, neuroendocrine tumors and other Non-Hodgkin lymphomas. We sought to establish a correlation between the histomorphologic features and immunohistochemical results of these neoplasms and analyse the diagnostic pitfalls. This is a retrospective observational study including 17 cases of HDCN collected over a period of three years. Formalin fixed paraffin embedded tissue underwent routine haematoxylin and eosin (H and E) staining and microscopic examination. An extensive immunohistochemical panel was performed and included markers necessary for the diagnosis (CD68, NSE, CD1a, CD4, CD21, CD23, cyclinD1, CD45, Ki67, vimentin, S100, and PanCK) and markers important to exclude other differentials. Among 17 cases, LCH (8/17; 47%) was the most common subtype, and HS (7/17; 41.1%) was the second most common case, each of FDSC (1/17; 5.8%) and FRCT (1/17; 5.8%). The mean age of the patients was 36.6 years with male to female ratio of 2.4:1. LCH was seen in head and neck region predominantly including occipital bone, scalp, subgaleal periosteum, external auditory canal, supraclavicular lymph node, and cervical spine. The site of HS varied from colon (2/7), lymph node (1/7), lower limb (2/7) and spine (2/7). FDSC was diagnosed in a lymph node and FRCT presented as an abdominal mass. For LCH, on morphology, grooved nuclei with longitudinal cleft in the Langerhans cells seen in a background eosinophilic infiltrate were the most striking morphologic feature (8/8; 1.00%). CD1a, S100 and CD68 co-positivity was seen in all eight cases of LCH. Histiocytic sarcoma showed a consistent positivity for CD68 and CD4 in all the cases. FDSC showed characteristic histomorphologic

features of tumor cells arranged in whorls, fascicles and storiform pattern with positivity of CD21 and CD23. The tumor cells in FRCT were arranged in a storiform pattern and showed positivity for vimentin and SMA. HDCNs are a rare group of hematologic disorders that have variable clinical presentations, rare sites and different prognoses. A careful morphologic evaluation and an extensive immunohistochemical work up are mandatory for their diagnoses. As a future standpoint, more cases need to be pooled, studied and evaluated for genetic studies to attain optimal treatment protocols for this rare group of neoplasms.

Keywords

Histiocytic, immunohistochemistry, histiocytic and dendritic cell neoplasms

Background

Histiocytic and dendritic cell neoplasms of the mediastinum can present critical analytic difficulties, in light of the fact that regularly these neoplasms comprise of an intricate admixture of cell types, just a subset of which are really neoplastic. Especially in little biopsies, the real essence of the neoplasm can be hard to recognize, given that the neoplastic cells can be rare. To stall this troublesome gathering of neoplasms, we adroitly partition them into two general classifications. Initial, one can consider those elements wherein histiocytic or dendritic cells are neoplastic, and themselves contain clonal hereditary variations from the norm prompting their self-ruling expansion. Because of the characteristically social nature of histiocytic and dendritic cells, it isn't astonishing that neoplasms made out of them frequently pull in lively non-neoplastic inflammatory infiltrates; this marvel prompts particular morphologic examples that can be promptly perceived and used to limit the differential finding. This gathering of tumors incorporates Langerhans cell histiocytosis (LCH), Rosai-Dorfman sickness (RDD), and follicular dendritic cell sarcoma (FDSC). While each has steady morphologic highlights, a focused on immunohistochemical board can likewise dependably isolate these elements and affirm the determination.

The subsequent gathering includes injuries that are quantitatively rich in histiocytic or dendritic cells, however these neoplasms are non-neoplastic spectators; these neoplasms are driven by clonal cells of non-histiocytic or dendritic cell genealogy, which draw in enormous quantities of amiable histiocytic as well as dendritic cells. This subsequent gathering incorporates B and T cell lymphoma, carcinoma, sarcoma, mesothelioma, and germ cell tumors, and comprises a basic agenda of conceivably misleading substances which must be foundationally thought of and prohibited prior to diagnosing an injury in the main classification. The morphologic cover between these two gatherings of neoplasms can be broad, and this trouble is additionally compounded by significant contrasts in anticipation and treatment between a considerable lot of these neoplasms. In conclusion, histiocytic sarcoma (HS) is maybe the most testing determination of all and rides these two classes; a few cases seem to emerge anew, while others appear to develop or transdifferentiate from a fundamental non-histiocytic neoplasm, and

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hence just gain histiocytic separation optionally.

The etiology of RDD involved long-standing discussion until a notable report that recognized totally unrelated changes in the mitogen-actuated protein kinase (MAPK) pathway; this work set up the neoplastic idea of RDD and prepared for focused treatments through specific restraint of this pervasively dysregulated kinase course. Resulting work has demonstrated that RDD cells express atomic cyclinD1, which seems to connect with their fundamental hereditarily disturbed MAPK pathway. CyclinD1 articulation is absolutely not explicit to RDD, but rather like S100, isn't typically brilliantly communicated by favorable histiocytes, and, especially in little biopsies, can feature unobtrusive emperipolesis pleasantly. Critically, a few pathologists may hold a particular image of the morphology of RDD like that of the first exemplary portrayal of the element, which clinically showed as monstrous cervical adenopathy in youthful African men. Exemplary instances of nodal RDD highlight a trademark design, with patent sinuses expanded so much that a serpiginous, anastomosing organization of pale zones, along with lamellated thickening of the nodal case, are promptly unmistakable at low amplification. In any case, the clinical and morphological range of RDD have extended fundamentally since the first portrayal, with nodal and extranodal cases being accounted for at basically any anatomic site. Further, the morphology of extranodal RDD is fairly unmistakable from the exemplary nodal sinus design, with collagenous fibrosis, rich lymphoplasmacytic penetrates, and spindling of the neoplastic cells speaking to a huge flight contrasted with nodal cases. It is these situations where a low limit for S100 and additionally cyclin D1 recoloring, and even atomic investigation looking for MAPK pathway related transformations can be basic or even fundamental for the analysis. Recollecting that RDD cells are regularly SOX10 negative regardless of solid S100 articulation is likewise valuable given that melanoma ought to consistently be considered in the differential conclusion of a histiocytoid neoplasm with a rich lymphoplasmacytic penetrate. Rather than RDD, melanoma regularly shows both SOX10 and S100 articulation, with the previous frequently more grounded and more diffuse. Articulation of HMB45, Melan-An and other more explicit melanocytic markers isn't seen in RDD. We likewise note that both RDD and melanoma may surely communicate both S100 and CyclinD1, which isn't astonishing given that they share hyperactivation of the MAPK pathway at the hereditary level. In spite of the fact that KRAS and MAP2K1 changes are the most well-known modifications seen in RDD, the standard BRAF V600E transformation has additionally been accounted for, and in this manner there is significant hereditary cover between these two neoplasms also.

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