Is there a need for IHC in diagnosing Round-cell Tumors of the Oral Cavity?

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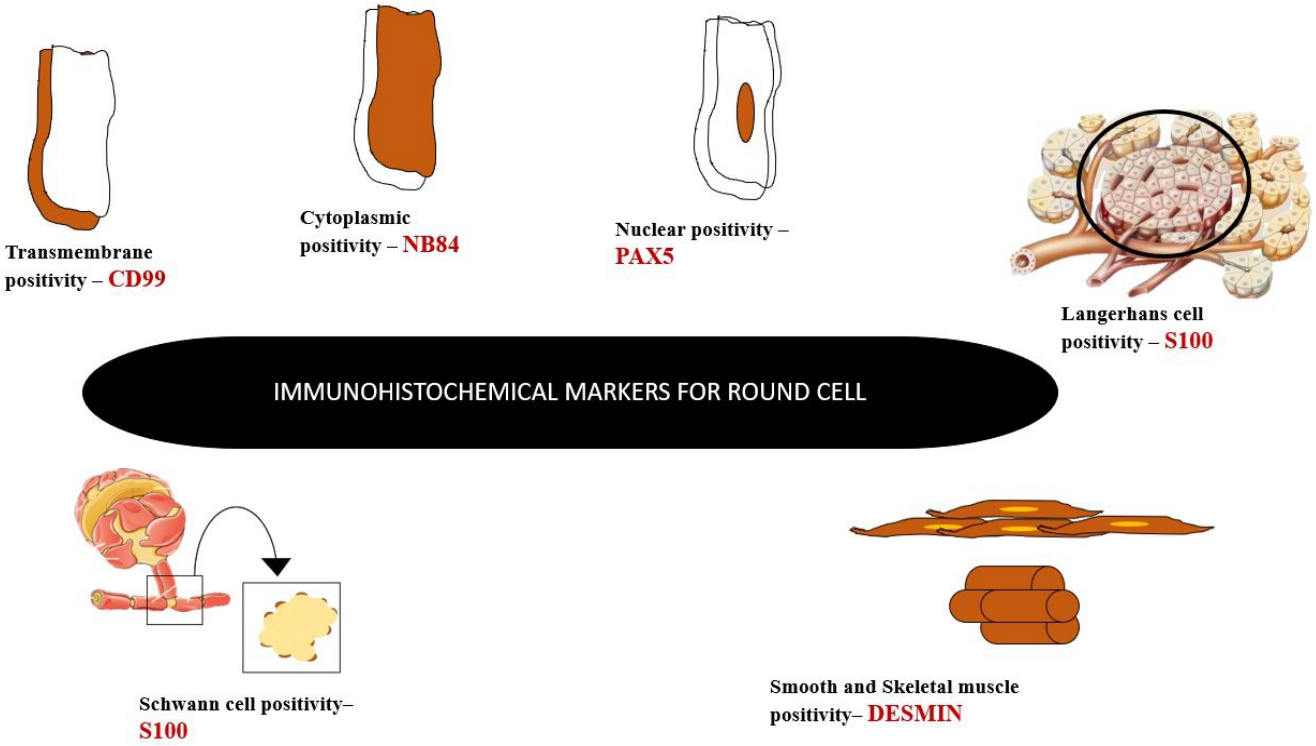
Dear Editor,

In this letter, we discuss the importance of utilizing immunohistochemistry (IHC) to assess different round-cell tumors of the oral cavity. While histopathologic examination is considered the gold standard, it can be challenging to draw conclusions based solely on this method. Round cell tumors exhibit significant microscopy and immunophenotypic overlap, making it difficult to differentiate between them[(1)]. IHC plays a crucial role in utilizing different markers to distinguish between various round-cell tumors. Lesions such as lymphoma and multiple myeloma share extensive similarities, but their cell of origin can be confirmed through the use of specific markers. Other tumors, including rhabdomyosarcoma, Ewing's sarcoma, haematolymphoid malignancies, neuroblastoma, mucosal melanoma, small-cell osteosarcoma, and mesenchymal chondrosarcoma, appear to occur in the head and neck region with a slight predominance, and oral sites are infrequently affected by these tumors, making their accurate diagnosis challenging[(2)]. Due to the overlap in clinical, imaging, and microscopic characteristics of tumors, the absence of unique immunohistochemical markers, and the substantial diversity within and across distinct subtypes, it has been proven in several investigations that IHC is necessary for accurate tumor differentiation.

IHC has become a critical diagnostic tool for identifying round-cell lesions. This method uses different markers to identify and examine the presence or absence of targets at the tissue and cellular level. Table 1 discusses the various markers and their presence in different round-cell lesions. In this letter, we shall also discuss the advantages and disadvantages of using IHC in diagnosing round-cell lesions.

Table 1: Various markers and their specific diagnostic value.

IHC Markers	The area where it stains	Examples
S-100	Schwann cells and Langerhans cells	Specific for benign and malignant nerve sheath tumors. Eg: Olfactory Neuroblastoma
Cd99	Transmembrane positivity	Ewing's Sarcoma, Synovial Sarcoma, mesenchymal chondrosarcoma, lymphoblastic lymphoma, Osteosarcoma, Desmoplastic Round cell tumor (DSRT).
Desmin	Smooth and Skeletal Muscle Cells. Smooth muscle cells: Cytoplasmic positivity Skeletal muscle: Z-zone between myofibrils	Peripheral Neuroectodermal tumor (PNET), DSRT, Neuroblastoma, Wilm's Tumor.
NB-84	Cytoplasmic positivity	Neuroblastoma, Ewing's Sarcoma, Rhabdomyosarcoma, Wilm's Tumor, DSRT
PAX-5	Nuclear positivity towards B-cells.	Merkel cell carcinoma, B-cell lymphoblastic lymphoma, neuroendocrine tumors.
Cytokeratin	Distinguishes epithelial and non- epithelial tumors	Ewings sarcoma, PNET, DSRT



One advantage of using IHC is that it provides a better and more specific diagnosis of round-cell lesions by enabling the localization and examination of targets at the tissue and cellular level. IHC markers can also predict the prognostic value of the lesion, which helps in determining the diagnosis. Additionally, IHC is crucial for providing significant information, and it must be performed at a high standard to ensure meaningful and reproducible results. IHC is also a simple and cost-effective process that requires minimal resources. Sections of stained tissue may be kept and retrieved as necessary, providing long-term storage capabilities[3].

However, there are also some limitations to using IHC. The specificity of an antibody might differ, necessitating extensive testing with the right controls. Because of the semi-quantitative nature of the approach, it is impossible to estimate with certainty the target's absolute abundance. The intensive processing of tissue might result in the loss of natural characteristics. IHC is a multi-step process that might add variability at any point, making the results difficult to reproduce[4].

In conclusion, IHC has emerged as a crucial diagnostic tool for identifying round-cell lesions. While it offers numerous advantages, there are also some limitations that must be considered when interpreting the results. Therefore, it is essential to perform IHC at a high standard to ensure meaningful and reproducible results. We hope our discussion sheds light on the significance of incorporating IHC in the diagnosis of round-cell tumors of the oral cavity.

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