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Immunohistochemistry

Ki-67 clone K-2: A useful marker of fat cells and lipoblasts

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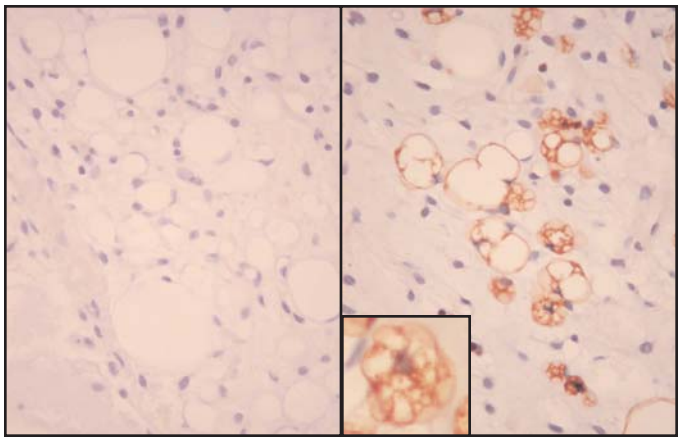
Ki-67 has been around for a long time, so most diagnostic pathologists are very familiar with its use as a marker of cell proliferation. The Ki-67 antigen is not expressed in cells in the G0 phase of the cell cycle, but is expressed in G1, S, G2, and M phases.

A number of different antibodies are available to the Ki-67 antigen, with MIB-1 probably the best known. In our ongoing quest to achieve optimal staining in the most economical fashion, we are continually evaluating different clones for the same marker, and for that reason we have evaluated a number of different Ki-67 antibodies, including clones MIB-1, 7B11, SP6, and K-2 (clone K-2 is available from ImmunoVision Technologies, Daly City, CA, http://www.immunovisiontech.com/index.shtml).

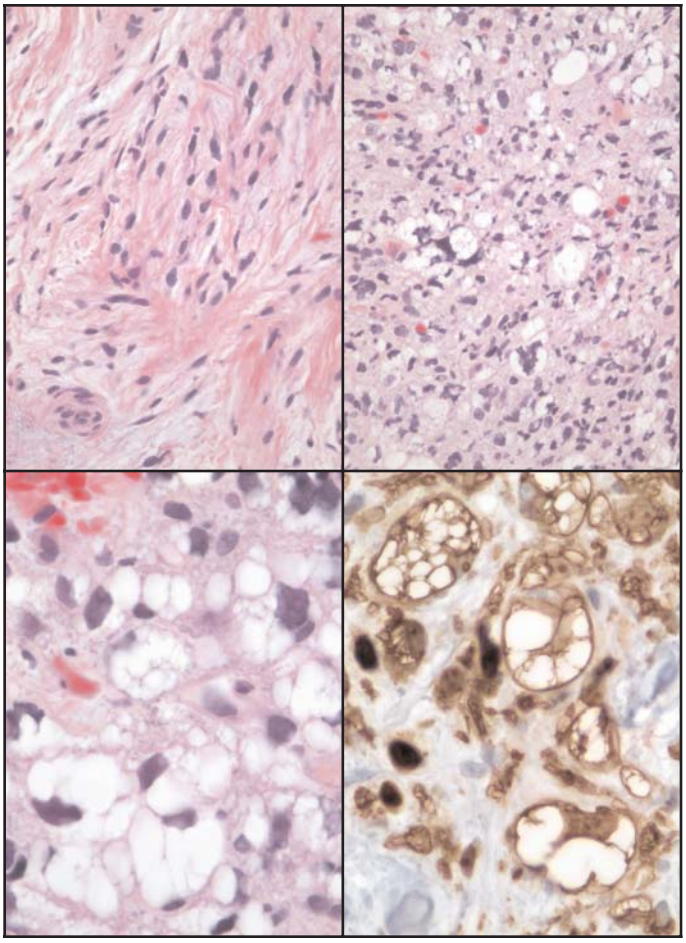
Several years ago, when evaluating Ki-67 clone K-2, we noticed that it specifically stained the cytoplasm of fat cells, in addition to showing expected nuclear staining of proliferating cells. Hepatocytes were the only other cells that we identified that demonstrated this cytoplasmic staining with clone K-2. As such, the thought crossed my mind that this clone might prove to be a useful marker of cells containing fat, particularly lipoblasts.

As any pathologist knows, lipoblasts are an important marker of liposarcoma. However, their identification can be challenging, and there are number of other cells that may mimic lipoblasts. For this reason, a marker that can reliably demonstrate lipoblasts could potentially be very useful in the diagnosis of liposarcoma.

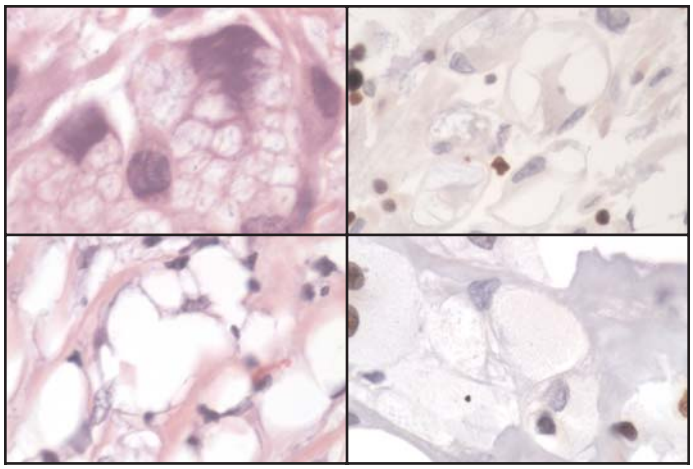


Ki-67 immunostains taken from a selected area of a 9 cm low grade myxoid liposarcoma of the thigh. The Ki-67 clone MIB-1 stain (left) does not stain lipoblasts, but lipoblasts are nicely highlighted by the Ki-67 clone K-2 (right).

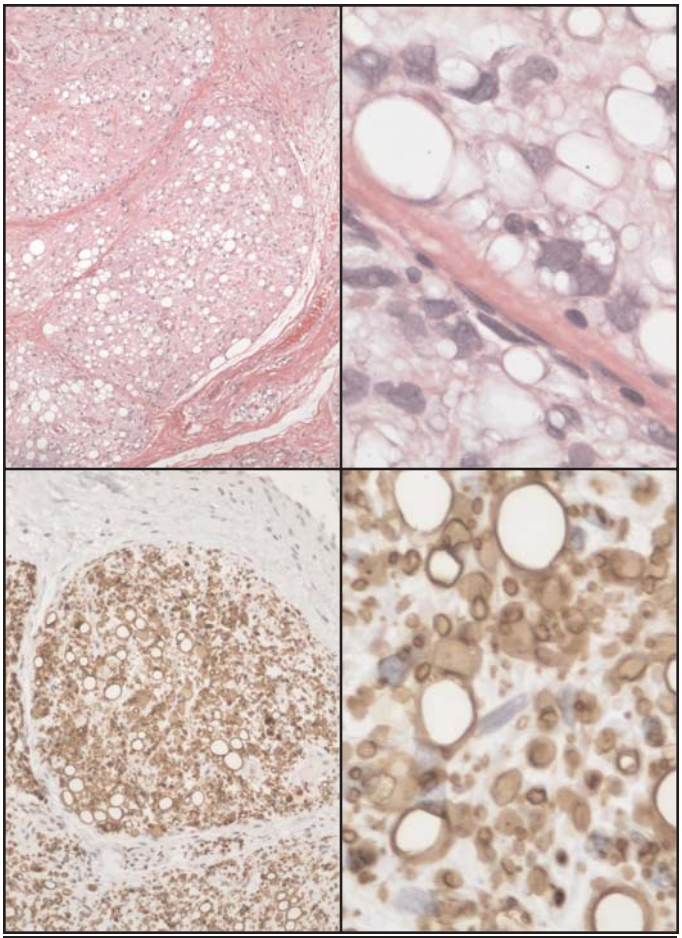
Liposarcoma is not one of the more common tumors that we see in our immunohistochemistry consultation service, so we have not had the opportunity to study large numbers of cases. However, in the relatively small number of liposarcoma cases that we have studied using Ki-67 clone K-2, it has performed very well as a marker of lipoblasts. In addition, it has not stained “pseudolipoblasts” in inflammatory myxohyaline tumor or areas of fat necrosis with “lipoblast-like” cells (although it stains the viable fat in fat necrosis). We encourage other laboratories to consider the use of this marker when faced with the problem of confirming or excluding lipoblasts, and ProPath has this antibody readily available for those who may not have it in their own laboratory.



H&E photos and Ki-67 clone K2 immunostain (bottom right) of a spindle cell liposarcoma from the back. The spindle cell areas were strongly positive with CD34 but negative for K-2, in contrast to the lipogenic areas, which were CD34 negative but contained lipoblasts strongly stained by K-2 (bottom right).



H&E and Ki-67 clone K-2 immunostains on "pseudo-lipoblasts" in a case of inflammatory myxohyaline tumor (top row) and fat necrosis (bottom row). Note absence of cytoplasmic staining with K-2.



H&E photos (top row) of low-grade liposarcoma from flank. The Ki-67 clone K-2 immunostain highlights lipoblasts and other fat-containing cells (bottom row)

References:

1. Dei Tos AP et al: Spindle cell liposarcoma, a hitherto unrecognized variant of liposarcoma. Am J Surg Pathol 18(9):913-921, 1994.
2. Montgomery EA et al: Inflammatory myxohyaline tumor of distal extremities with virocyte or Reed-Sternberg like cells: a distinctive lesion with features simulating inflammatory conditions, Hodgkin's disease, and various sarcomas. Mod Pathol 11 (4): 384-391, 1998.

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