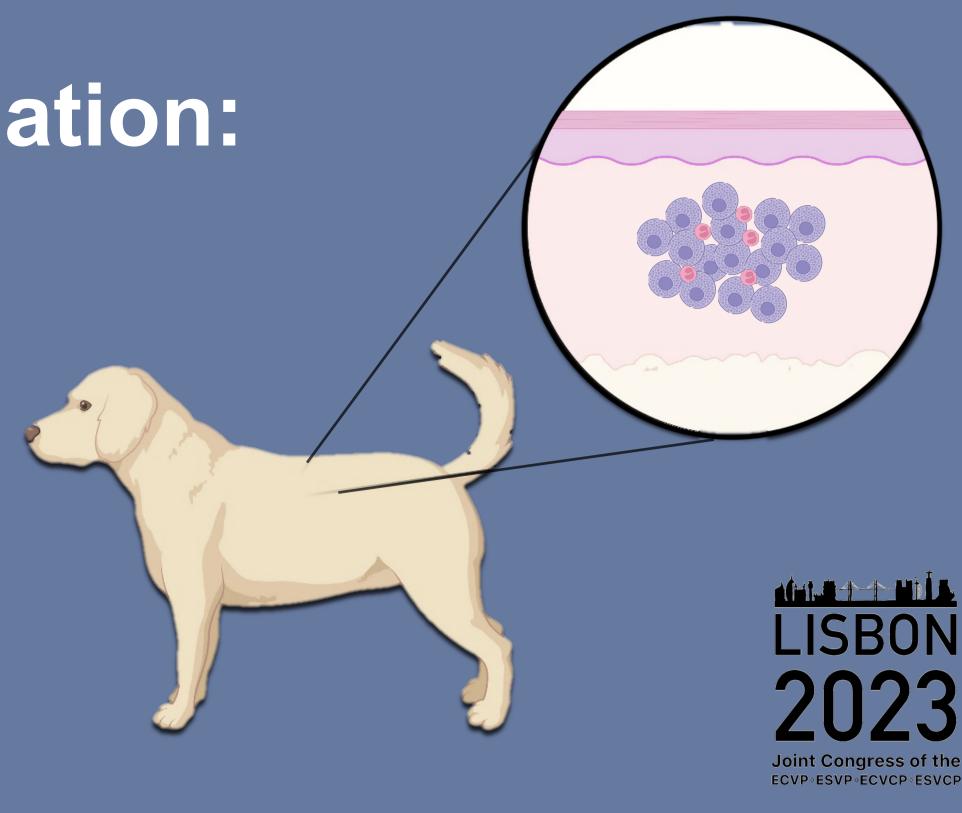
Streamlining Microscope-Based Ki67 Index Estimation: Let's Make It Simple!

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Introdution

Pathologists are requested to provide accurate mast cell tumours (MCTs) proliferation index (PI) based on Ki67 immunohistochemistry. For the accurate determination of percentage of Ki67 positive cells various systems have been implemented, recent ones using digitalized image analysis programmes. The aim of our presentation is to propose a straightforward and microscope-based method for Ki67 index estimation in MCTs that requires no supplementary equipment.

Materials and Methods



- 20 MCTs of various types of cell density were selected, from compact to disperse.
- Using an Olympus CX23, ten continuous HPF images were photographed for each of these MCTs (×40 objective paired with a ×10/20 eyepiece; Field of view = 0.5 mm). A mobile phone camera was used via a simple adapter. Mast cell counting was performed using Image J.

Mast cell counts underwent equal-width binning, resulting

Mast cell counts underwent equal-width binning, resulting in the establishment of three classes according to cell concentration.

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PI was then estimated counting Ki67 positive cells (Mib1 by DAKO) in ten HPF. This system was applied to 132 MCTs.

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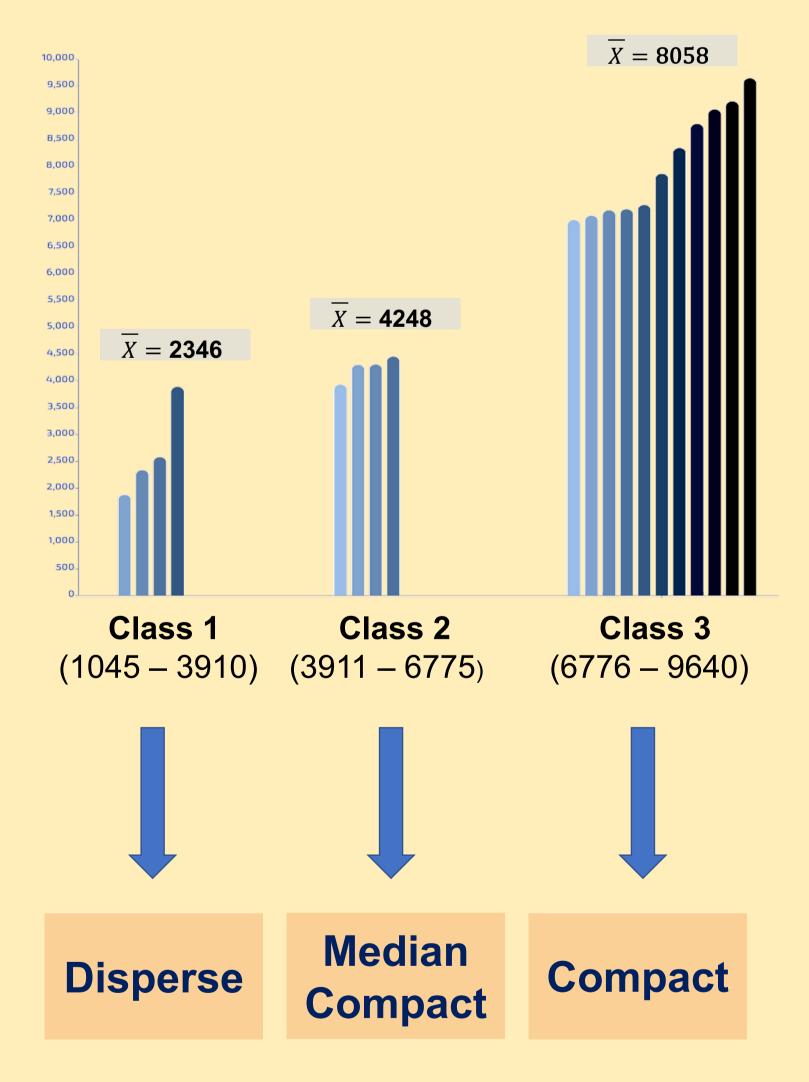
 QuPath software was employed to validate the Ki67 index in five randomly selected MCTs. Wilcoxon Signed Rank Test assessed statistical discrepancies between measurements.

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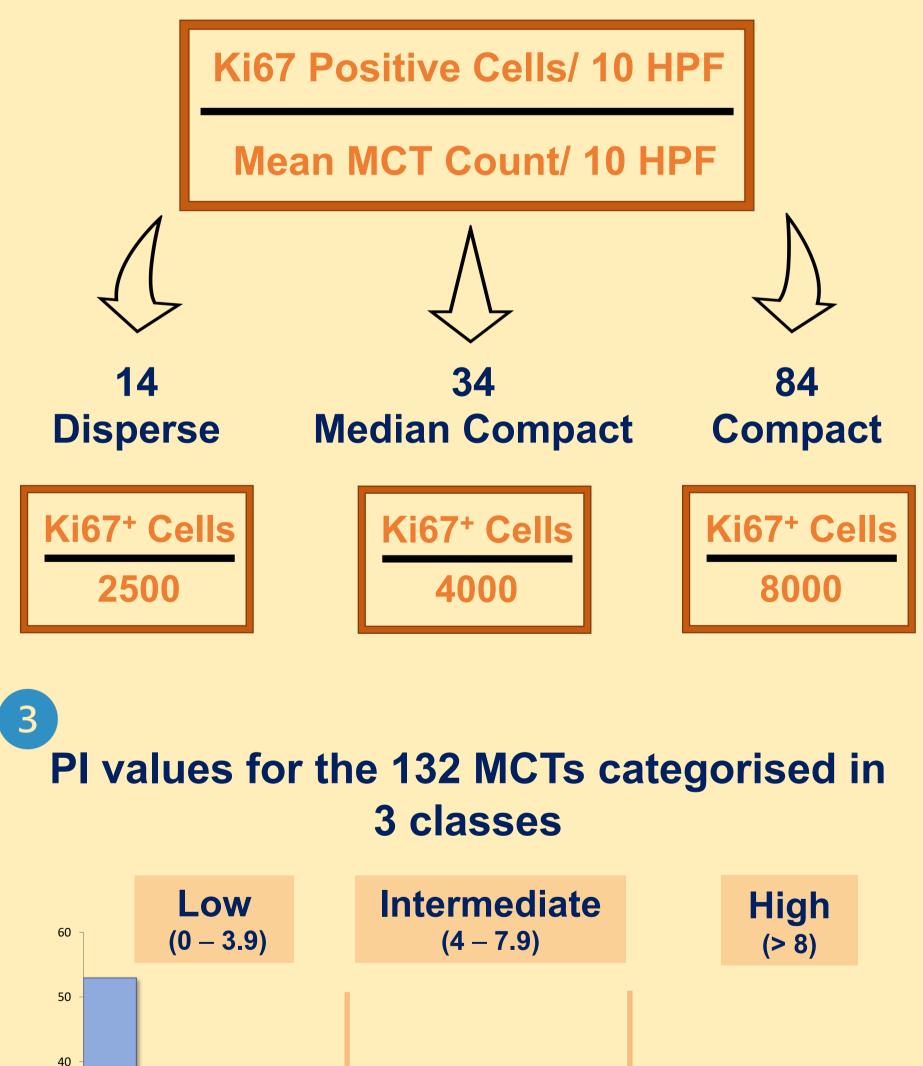
 PI value-mitotic index disparities were investigated in the uppermost PI cases.

Results

Classes of Cell Distribution in MCTs



PI Estimation (%) in 132 MCT



QuPath analysis showed no significant discrepancies with our measurements (p = 0.23; p = 0.5).

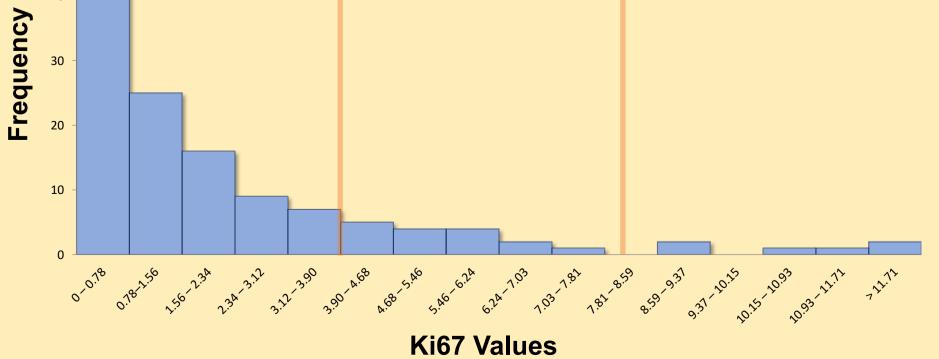
Ki67 Values	
QuPath	
2.65	
5.30	
9.75	
12.25 4.43	

5 Within the high PI value group (N=6), two cases demonstrated PI-mitotic index disparities (33.3%).

PI – Mitotic Index Disparities



* The mean value in each group was rounded to practical values.



Frequency Distribution of Ki67 Values in 132 Mast Cell Tumors

PI value (> 8)	Mitotic index
8.75	< 1
8.75	< 1
10.63	10
11.25	25
12.50	6
12.50	20

Conclusions

Ki-67 can be accurately assessed using a simple microscope-based method. This marker plays a crucial role in MCTs, offering valuable prognostic insights and uncovering cases where the mitotic index may not accurately reflect the actual cell proliferation rate.





