Automated counting of Ki-67 labeling index compares with eyeballing estimation to predict behavior of pituitary adenoma.

Chaiwat Aphivatanasiri[1] M.D., Sakda Waraasawapati[1] M.D., Chawalit Pairojkul[1] M.D., Pichayen Daungthongpon[2] M.D.

[1]Department of Pathology, Faculty of Medicine, KhonKaen University,

[2]Department of Surgery, Faculty of Medicine, KhonKaen University

ABSTRACT

Introduction: Pituitary adenoma has been classified as benign according to slow-growing tumor. However, some atypical pituitary adenoma may have clinical aggressiveness such as parasellar invasion and high recurrence rate.Many studies have failed to demonstrate a correlation between Ki-67 labeling index and behavior of this tumor. Eyeballing is a common method for evaluation of Ki-67, however, reliability and reproducibility are in question.

Objectives: The primary objective of this study was to compare two different methods of measuring Ki-67 labeling index in pituitary adenoma correlated with clinical outcome.

Materials and Methods: Histopathology of 95 pituitary adenomas which has been operated between 2009 and 2015 were reviewed. Ki-67 immunohistochemistry has been performed and sent for digital slide scanning. Ki-67 labeling index was evaluated at least 2000 tumor cells in hotspot areas with two methods;(1) Eyeballing estimation consensus by two pathologists, (2) Software-Automated counting with Fiji software (ImageJ-based) and plugin (Ret FM-J) validated with manual counting.

Results: There are 74 first-time operated pituitary adenomas specimens with average age of 46. 93 years. Six cases (8.11%) has been recurred with re-operation.Means Ki-67 labeling index are 2.65 and 1.17for eyeballing and automated counting, respectively. Automated Ki-67 was significant lower than eyeballing ($p<0.001$) . Neither eyeballing nor automated Ki-67 counting demonstrates significant correlation with aggressiveness and recurrence.

Conclusion: Eyeballing estimation for Ki-67 tends to overrate comparing with digital automated counting. According to no significant correlation between Ki-67 and clinical outcome, using of Ki-67 labeling index in pituitary adenomas should be made with caution.

Keywords: Pituitary adenoma, Eyeballing estimation, Ki-67