

Ki67 for pituitary neuroendocrine tumor

Advantages

MIB1 discriminates between proliferating and quiescent cells; valuable prognostic indicator; Ki-67 $\geq 3\%$ is associated with aggressive clinical behaviour; and Ki-67 $\geq 3\%$ cut-off used for defining atypical adenomas.

Disadvantages

Inconsistent findings related to differences in laboratory techniques and immunostaining protocols; produces different values in different samples of the same tumour (sampling inconsistency); and lack of standardization of the technique (hot spots versus random fields).

The aim of a study was to assess Ki-67 proliferation rates in different regions of pituitary neuroendocrine tumors and to statistically analyse these data for potential regional differences within each tumor. Ki-67 proliferation index was assessed in smear preparations of 100 specimens of 26 consecutive patients operated on for pituitary neuroendocrine tumor in the Department of Neurosurgery, Medical University Vienna. Depending on the size and extent of the tumor, a mean of 4 tissue samples (range 2-8) was selected intraoperatively from each adenoma from endosellar, suprasellar, parasellar, and basal sellar dural locations. Overall mean cell proliferation rate measured by Ki-67 was $1.81 \pm 0.90\%$ (range 0.33-3.43%). Histologically invasive adenomas had significantly higher mean Ki-67 proliferation index in all samples from the same tumor than non-invasive adenomas ($2.01 \pm 0.91\%$ vs. $1.11 \pm 0.59\%$; $P = 0.024$). Multiregional sampling revealed a homogenous distribution of Ki-67 index throughout an individual adenoma with no significant differences between any two different regions on t-test. Our data confirm that location of a biopsy does not influence Ki-67 index. Therefore, Ki-67 index of a single biopsy is representative for the whole individual adenoma. Thus Ki-67 index can be considered a reliable parameter for assessment of cell proliferation rate in adenoma biopsies and may be used for postoperative patient management considerations ¹⁾.

Tumor specimens were obtained from 44 consecutive patients with pituitary macroadenomas who underwent surgery between July 1998 and August 2003. Specimens were immediately fixed in 10% buffered formalin and then embedded in paraffin. The Ki-67 antigen was assessed by immunohistochemical analysis using the monoclonal antibody. We investigated the correlation of the Ki-67 labeling index with the following clinical and radiological characteristics: sex, age, presence or absence visual field defect, tumor classification, maximal tumor diameter, Hardy's classification, type of tumor, invasiveness, and recurrence. Our study suggests that the clinical characteristics such as visual field defect and recurrence are correlated with the high Ki-67 labeling index. No statistical differences were observed in the Ki-67 labeling index in relation to the following characteristics: sex, age, tumor classification, maximal tumor diameter, Hardy's classification, type of tumor, and invasiveness into the sphenoid sinus or cavernous sinus ²⁾.

Prevedello et al., report the case of an extremely rapidly growing pituitary neuroendocrine tumor with

cavernous sinus invasion. The lesion, which displayed a high Ki-67 labeling index (LI; 22%), was found in a 54-year-old woman who presented with diplopia and headaches. The patient underwent three transsphenoidal operations in less than 6 months and, ultimately, was treated with fractionated intensity-modulated radiation therapy ³⁾.

1)

Wolfsberger S, Kitz K, Wunderer J, Czech T, Boecher-Schwarz HG, Hainfellner JA, Knosp E. Multiregional sampling reveals a homogenous distribution of Ki-67 proliferation rate in pituitary neuroendocrine tumors. *Acta Neurochir (Wien)*. 2004 Dec;146(12):1323-7; discussion 1327-8. PubMed PMID: 15480830.

2)

Paek KI, Kim SH, Song SH, Choi SW, Koh HS, Youm JY, Kim Y. Clinical significance of Ki-67 labeling index in pituitary macroadenoma. *J Korean Med Sci*. 2005 Jun;20(3):489-94. PubMed PMID: 15953875; PubMed Central PMCID: PMC2782209.

3)

Prevedello DM, Jagannathan J, Jane JA Jr, Lopes MB, Laws ER Jr. Relevance of high Ki-67 in pituitary neuroendocrine tumors. Case report and review of the literature. *Neurosurg Focus*. 2005 Nov 15;19(5):E11. Review. PubMed PMID: 16398461.

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