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放射線治療に対する腫瘍増殖反応の¹⁸F-FLTによる評価：ヒト頭頸部癌移植モデル動物におけるKi-67との比較検討

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Objectives: Although radiotherapy (RT) is an important treatment mode for head and neck cancers, it induces repopulation which adversely affects therapy outcome. Accordingly, evaluation of such tumor response is indispensable for selecting optimal treatment strategy. ¹⁸F-fluorothymidine (FLT) is a noninvasive marker for assessing tumor proliferation. Thus, we evaluated whether FLT can predict tumor responses and repopulation after RT in human head and neck cancer xenografts (FaDu) in comparison with Ki-67.

Methods: FaDu xenografts were established in nude mice and assigned to control and RT-treated groups (10 and 20 Gy). Tumor volume was measured daily. Mice were sacrificed 6, 24, 48 hrs, and 7 days after RT. ³H-FLT was injected 2 hrs before sacrifice. Intratumoral ³H-FLT level and Ki-67 was visually and quantitatively assessed by autoradiography (ARG) and immunohistochemistry (IHC). **Results:** In radiation-treated mice, the tumor growth was significantly suppressed compared with the control, but the tumor volume in these mice gradually increased with time. In both treated groups, ³H-FLT levels markedly decreased to 45 and 40% of control at 6 hrs ($P < 0.0001$) and then gradually increased with time; ³H-FLT levels at 48 hrs and on day 7 were significantly higher than that at 6 hrs. No apparent changes were observed in Ki-67 IHC.

Conclusion: FLT level markedly decreased at 6 hrs and then gradually increased with time, reflecting tumor response and repopulation after RT. FLT PET may be useful for early evaluation of tumor proliferation response to RT.