

Autologous formalin-fixed tumor vaccine

Case reports

A 32-year-old man presented with left facial numbness and right hemiparesis and was referred to our department. MRI and open biopsy indicated brainstem glioma, and he was specifically diagnosed with isocitrate dehydrogenase 1-mutant diffuse astrocytoma of WHO grade II. He was treated with stereotactic radiotherapy followed by [autologous formalin-fixed tumor vaccine](#) (AFTV) three months later. MRI conducted at 42 months after the combination therapy showed a 91% decrease in tumor volume, and the regression was maintained for 5 years. Thus, combination treatment with radiotherapy and immunotherapy may prove to be a promising alternative for the treatment of brainstem glioma ¹⁾.

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3: Miyoshi T, Kashiwabara T, Asahi A, Kataoka T, Maruyama T, Okada R, Uemae Y, Ohno T. Complete remission of chemo-refractory multiple-metastatic upper tract urothelial carcinoma by autologous formalin-fixed tumor vaccine. *Clin Case Rep*. 2017 Sep 15;5(11):1780-1784. doi: 10.1002/ccr3.1179. PMID: 29152270; PMCID: PMC5676256.

4: Ishikawa E, Yamamoto T, Matsumura A. Prospect of Immunotherapy for Glioblastoma: Tumor Vaccine, Immune Checkpoint Inhibitors and Combination Therapy. *Neurol Med Chir (Tokyo)*. 2017 Jul 15;57(7):321-330. doi: 10.2176/nmc.nmc.ra.2016-0334. Epub 2017 May 24. PMID: 28539528; PMCID: PMC5566705.

5: Miyazaki T, Ishikawa E, Matsuda M, Akutsu H, Osuka S, Sakamoto N, Takano S, Yamamoto T, Tsuboi K, Matsumura A. Assessment of PD-1 positive cells on initial and secondary resected tumor specimens of newly diagnosed glioblastoma and its implications on patient outcome. *J Neurooncol*. 2017 Jun;133(2):277-285. doi: 10.1007/s11060-017-2451-7. Epub 2017 Apr 26. PMID: 28447277.

6: Ishikawa E, Muragaki Y, Yamamoto T, Maruyama T, Tsuboi K, Ikuta S, Hashimoto K, Uemae Y, Ishihara T, Matsuda M, Matsutani M, Karasawa K, Nakazato Y, Abe T, Ohno T, Matsumura A. Phase I/IIa trial of fractionated radiotherapy, temozolomide, and autologous formalin-fixed tumor vaccine for newly diagnosed glioblastoma. *J Neurosurg*. 2014 Sep;121(3):543-53. doi: 10.3171/2014.5.JNS132392. Epub 2014 Jul 4. PMID: 24995786.

7: Ishida A, Watanabe M, Matsuo S, Niimura K, Yoshimoto H, Asakuno K, Shiramizu H, Nemoto A, Yuzawa M, Hori T. Achievement of three year remission in a case of aggressive glioblastoma using a multidisciplinary treatment strategy: A case report. *Oncol Lett*. 2014 May;7(5):1608-1612. doi: 10.3892/ol.2014.1937. Epub 2014 Mar 5. PMID: 24765187; PMCID: PMC3997711.

8: Sakamoto N, Ishikawa E, Yamamoto T, Satomi K, Nakai K, Sato M, Enomoto T, Morishita Y, Takano S, Ohno T, Tsuboi K, Matsumura A. Pathological changes after autologous formalin-fixed tumor vaccine therapy combined with temozolomide for glioblastoma - three case reports - . *Neurol Med Chir*

(Tokyo). 2011;51(4):319-25. doi: 10.2176/nmc.51.319. PMID: 21515959.

9: Ishikawa E, Tsuboi K, Yamamoto T, Muroi A, Takano S, Enomoto T, Matsumura A, Ohno T. Clinical trial of autologous formalin-fixed tumor vaccine for glioblastoma multiforme patients. Cancer Sci. 2007 Aug;98(8):1226-33. doi: 10.1111/j.1349-7006.2007.00518.x. Epub 2007 May 22. PMID: 17517052.

1)

Morimoto T, Matsuda R, Nakazawa T, Nishimura F, Nakagawa I. Combined Treatment With Radiotherapy and Immunotherapy for Isocitrate Dehydrogenase Mutant Brainstem Glioma in Adult: A Case Report. Brain Tumor Res Treat. 2022 Apr;10(2):129-133. doi: 10.14791/btrt.2022.0009. PMID: 35545834.

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