# Bevacizumab for meningioma

If VEGF is responsible for the formation of peritumoral brain edema (PTBE), the edema may be treated with the anti-VEGF drug Bevacizumab (Avastin), which has been shown to reduce PTBE in patients with glioblastoma multiforme [1].

Antiangiogenic agents appear to be safe for the treatment of patients with nonmalignant brain tumors, and in select cases may be efficacious [2].

## 2015

Ly et al. report a patient with a recurrent left frontotemporal meningioma and associated-vision loss who experienced substantial visual field recovery after 3 cycles of bevacizumab [3].

## 2014

Boström et al. report the case of an 80-year-old woman who underwent bevacizumab therapy (5 mg/kg every 2 weeks for 2 months) for treatment of a symptomatic radiation necrosis in malignant meningiomatosis of World Health Organization (WHO) grade III. The patient was closely monitored with MRI including diffusion and perfusion studies. Upon bevacizumab therapy, the clinical situation was well stabilized over a period of 4 months until the patient unfortunately died due to pneumonia/septicemia probably unrelated to bevacizumab therapy. Consecutive MRI demonstrated 4 important aspects: (1) considerable decrease of the contrast medium (CM)-enhanced radiation necrosis, (2) mixed response with respect to the meningiomatosis with stable and predominantly growing tumor lesions, (3) a new diffusion-weighted imaging (DWI) lesion in a CM-enhanced tumor as described in gliomas, which we did not interpret as a response to bevacizumab therapy, and (4) new thrombembolic infarcts, which are a known side-effect of bevacizumab treatment [4].

## 2012

Wilson et al. report a patient with the regression of a recurrent World Health Organization grade I meningioma during combination chemotherapy with bevacizumab and paclitaxel for breast cancer. This chemotherapy regimen has never been explored for recurrent meningiomas. While further data are necessary, they suggest that combination chemotherapy with bevacizumab and paclitaxel may be an option for treatment of recurrent meningiomas when no further surgical or radiotherapy options exist [5]

## 2011

Radiographic regression of cranial meningioma in a NF2 patient treated by bevacizumab [6].

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Two Phase II trials with sunitinib and vatalanib showed a hint of activity in patients with recurrent or

progressive meningiomas [7].

## 2010

Puchner et al. report of a partial remission of an anaplastic meningioma induced by antiangiogenic therapy. The fact that the regression did not only include the contrast-enhancing T1 lesions but also the T2 hyperintensities in the center of the tumor (not only the peripheral edema zone) suggests a true tumor regression beyond mere vascular effects and pseudoresponse appears to be unlikely. Since anaplastic meningioma is a devastating disease without established chemotherapeutic option, the therapeutic success presented here is substantial. On the base of the presented case, bevacizumab therapy should be explored further in this indication [8].

1)
Nassehi D, Dyrbye H, Andresen M, Thomsen C, Juhler M, Laursen H, Broholm H. Vascular endothelial growth factor A protein level and gene expression in intracranial meningiomas with brain edema. APMIS. 2011 Dec;119(12):831-43. doi: 10.1111/j.1600-0463.2011.02764.x. Epub 2011 Oct 17. PubMed PMID: 22085359.
2)
Hawasli AH, Rubin JB, Tran DD, Adkins DR, Waheed S, Hullar TE, Gutmann DH, Evans J, Leonard JR, Zipfel GJ, Chicoine MR. Antiangiogenic agents for nonmalignant brain tumors. J Neurol Surg B Skull Base. 2013 Jun;74(3):136-41. doi: 10.1055/s-0033-1338262. Epub 2013 Mar 13. PubMed PMID: 24436903; PubMed Central PMCID: PMC3709924.
3)
Ly KI, Hamilton SR, Rostomily RC, Rockhill JK, Mrugala MM. Improvement in Visual Fields After Treatment of Intracranial Meningioma With Bevacizumab. J Neuroophthalmol. 2015 Jun 2. [Epub ahead of print] PubMed PMID: 26049681.
4)
Boström JP, Seifert M, Greschus S, Schäfer N, Glas M, Lammering G, Herrlinger U. Bevacizumab treatment in malignant meningioma with additional radiation necrosis. An MRI diffusion and perfusion case study. Strahlenther Onkol. 2014 Apr;190(4):416-21. doi: 10.1007/s00066-013-0505-0. Epub 2014 Jan 17. PubMed PMID: 24429478.
5)
Wilson TJ, Heth JA. Regression of a meningioma during paclitaxel and bevacizumab therapy for breast cancer. J Clin Neurosci. 2012 Mar;19(3):468-9. doi: 10.1016/j.jocn.2011.07.024. Epub 2012 Jan 14. PubMed PMID: 22245272.
6)
Goutagny S, Raymond E, Sterkers O, Colombani JM, Kalamarides M. Radiographic regression of cranial meningioma in a NF2 patient treated by bevacizumab. Ann Oncol. 2011 Apr;22(4):990-1. doi: 10.1093/annonc/mdr012. Epub 2011 Feb 28. PubMed PMID: 21357650.
7)
Ahluwalia MS. 2010 Society for Neuro-Oncology Annual Meeting: a report of selected studies. Expert Rev Anticancer Ther. 2011 Feb;11(2):161-3. doi: 10.1586/era.10.227. PubMed PMID: 21342033.
8)
Puchner MJ, Hans VH, Harati A, Lohmann F, Glas M, Herrlinger U. Bevacizumab-induced regression of anaplastic meningioma. Ann Oncol. 2010 Dec;21(12):2445-6. doi: 10.1093/annonc/mdq634. Epub 2010 Nov 1. PubMed PMID: 21041375.