

# Vascular Endothelial Growth Factor in chronic subdural hematoma

**Vascular endothelial growth factor** (VEGF), one of the important growth factors regulating angiogenesis, is expressed in the neomembranes and also in hematoma fluid, and the **MAP ERK pathway** has been implicated in angiogenesis by VEGF.

The report of Weigel et al. was the first to suggest a pathophysiological link between the **VEGF** concentration and the exudation rate underlying the steady increase of **chronic subdural hematoma** volume and CT appearance. With this finding, the current report adds another piece of evidence in favor of the pathophysiological role of VEGF in the development of CSH, including mechanisms contributing to hematoma growth and CT appearance <sup>1)</sup>.

The precise mechanisms remain to be determined.

Saito et al. suggest that the **TGF beta-ALK1** pathway and VEGF affect neovascularization and the progression of CSH. <sup>2)</sup>

Finding supports the hypothesis that high VEGF concentration in the hematoma fluid is of major pathophysiological importance in the generation and steady increase of the hematoma volume, as well as the determination of MRI appearance <sup>3)</sup>.

<sup>1)</sup>

Weigel R, Hohenstein A, Schilling L. Vascular endothelial growth factor concentration in chronic subdural hematoma fluid is related to computed tomography appearance and exudation rate. J Neurotrauma. 2014 Apr 1;31(7):670-3. doi: 10.1089/neu.2013.2884. Epub 2014 Jan 17. PubMed PMID: 24245657; PubMed Central PMCID: PMC3961767.

<sup>2)</sup>

Saito A, Narisawa A, Takasawa H, Morita T, Sannohe S, Sasaki T, Kurotaki H, Nishijima M. Expression of the TGF- $\beta$ -ALK-1 pathway in dura and the outer membrane of chronic subdural hematomas. Neurol Med Chir (Tokyo). 2014;54(5):357-62. Epub 2013 Dec 5. PubMed PMID: 24305026.

<sup>3)</sup>

Hua C, Zhao G, Feng Y, Yuan H, Song H, Bie L. Role of Matrix Metalloproteinase-2, Matrix Metalloproteinase-9, and Vascular Endothelial Growth Factor in the Development of Chronic Subdural Hematoma. J Neurotrauma. 2015 Aug 6. [Epub ahead of print] PubMed PMID: 25646653.

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