

Saccular [intracranial aneurysm rupture](#) leads to [subarachnoid hemorrhage](#) and is preceded by chronic [inflammation](#) and atherosclerotic changes of the Saccular intracranial [aneurysm wall](#). Increased [lymphangiogenesis](#) has been detected in atherosclerotic extracranial arteries and in [abdominal aortic aneurysms](#), but the presence of lymphatic [vessels](#) in [saccular intracranial aneurysm](#) (sIAs) has remained unexplored. Huuska et al. studied the presence of lymphatic vessels in 36 intraoperatively resected sIAs (16 unruptured and 20 ruptured), using immunohistochemical and [immunofluorescence](#) stainings for [Lymphatic endothelial cells](#) (LEC) [markers](#). Of these LEC-markers, both extracellular and intracellular [LYVE1](#), [podoplanin](#), [VEGFR-3](#), and [Prox1](#)-positive stainings were detected in 83%, 94%, 100%, and 72% of the 36 sIA walls, respectively. Lymphatic vessels were identified as ring-shaped structures positive for one or more of the LEC markers. Of the sIAs, 78% contained lymphatic vessels positive for at least one LEC marker. The presence of LECs and lymphatic vessels were associated with the number of CD68+ and CD163+ cells in the sIA walls, and with the expression of inflammation indicators such as serum amyloid A, myeloperoxidase, and cyclo-oxygenase 2, with the presence of a [thrombus](#), and with the sIA wall rupture. Large areas of VEGFR-3 and  $\alpha$ -smooth muscle actin ( $\alpha$ SMA) double-positive cells were detected in medial parts of the sIA walls. Also, a few [podoplanin](#) and  $\alpha$ SMA double-positive cells were discovered. In addition, LYVE-1 and [CD68](#) double-positive cells were detected in the sIA walls and in the thrombus revealing that certain CD68+ [macrophages](#) are capable of expressing LEC markers. This study demonstrates for the first time the presence of [lymphatic vessels](#) in human sIA walls. Further studies are needed to understand the role of lymphatic vessels in the [saccular intracranial aneurysm pathogenesis](#) <sup>1)</sup>.

<sup>1)</sup>

Huuska N, Netti E, Lehti S, Kovanen PT, Niemelä M, Tulamo R. [Lymphatic vessels](#) are present in human [saccular intracranial aneurysms](#). Acta Neuropathol Commun. 2022 Sep 5;10(1):130. doi: 10.1186/s40478-022-01430-8. PMID: 36064651.

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