Tumor vessel

A tumor vessel is a blood vessel that is formed within a tumor or in the area surrounding the tumor as a result of tumor-induced angiogenesis (the formation of new blood vessels). These vessels are different from normal blood vessels in that they are often poorly formed, leaky, and irregular in shape and size.

Tumor vessels play a crucial role in tumor growth and metastasis by providing nutrients and oxygen to the tumor cells, as well as allowing the tumor cells to escape into the bloodstream and spread to other parts of the body. The abnormal structure and function of tumor vessels also contribute to the resistance of some tumors to chemotherapy and radiation therapy.

Research is ongoing to develop therapies that can target the abnormal tumor vessels while sparing normal blood vessels. These therapies, known as anti-angiogenic therapies, aim to starve the tumor of its blood supply, ultimately leading to tumor shrinkage and improved patient outcomes.

The detailed ultrastructural survey of 18 isocitrate dehydrogenase-wildtype (IDH1-wt) glioblastomas and 12 isocitrate dehydrogenase-mutant (IDH1-mt) High-grade gliomas indicated that tumor vessels of both types had undergone deformities such as the thickening of the vessel wall (VW) and proliferation of the basement membrane, contour distortions, abnormal and discontinuous basal lamina, tumor cells' invasion and colonization of VW, disappearance of endothelial cells (ECs), pericytes, and smooth muscle cells, as well as the formation of a continuous ring of tumor cells attached to the luminal side of VW in numerous cases. The latter feature is a clear sign of vascular mimicry (VM) that was previously suggested in gliomas but never shown by TEM. Additionally, the vascular invasion was carried out by a large number of tumor cells and was accompanied by the accumulation of tumor lipids in the vessels' lumina and VWs; these two features are distinct for gliomas and may alter the course of the clinical presentation and overall prognosis. This raises the issue of how to specifically target tumor cells involved in vascular invasion in order to optimize prognosis and overcome these mechanisms employed by the tumor cells [1)].

1)
Maraqah HH, Abu-Asab MS, Lee HS, Aboud O. Astrocytoma and glioblastoma IDH1-wildtype cells colonize tumor vessels and deploy vascular mimicry. Ultrastruct Pathol. 2023 May 5:1-8. doi: 10.1080/01913123.2023.2205927. Epub ahead of print. PMID: 37144386.