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Blood–Brain Barrier Disruption for the Treatment of Primary Brain Tumors: Advances in the Past Half-Decade

Piiamaria S Virtanen ¹, Kyle J Ortiz ¹, Ajay Patel ¹, William A Blocher 3rd ², Angela M Richardson ¹

Affiliations

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Abstract

Purpose of review: To review relevant advances in the past half-decade in the treatment of primary brain tumors via modification of blood-brain barrier (BBB) permeability.

Recent findings: BBB disruption is becoming increasingly common in the treatment of primary brain tumors. Use of mannitol in BBB disruption for targeted delivery of chemotherapeutics via superselective intra-arterial cerebral infusion (SIACI) is the most utilized strategy to modify the BBB. Mannitol is used in conjunction with chemotherapeutics, oligonucleotides, and other active agents. Convection-enhanced delivery has become an attractive option for therapeutic delivery while bypassing the BBB. Other technologic innovations include laser interstitial thermal therapy (LITT) and focused ultrasound (FUS) which have emerged as prime modalities to directly target tumors and cause significant local BBB disruption. In the past 5 years, interest has significantly increased in studying modalities to disrupt the BBB in primary brain tumors to enhance treatment responses and improve clinical outcomes.

Keywords: Blood–brain barrier (BBB); Blood–brain barrier disruption (BBBD); Brain malignancy therapies; Clinical trial; Drug delivery; Glioma; Neuro-oncology; Neurosurgical oncology, CNS drug delivery; Primary brain tumors.

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