Preoperative embolization of intracranial meningioma

Embolization for meningiomas is location specific, size dependent, institution dependent, and potentially controversial. May be best reserved for large hypervascular convexity meningiomas. Usually performed 24 hours to 1 week preoperatively. The devascularization causes attenuation in intraoperative blood loss and the resultant necrosis frequently renders the tumor softer and easier to remove. However, tumor swelling may occur and occasionally an emergency craniotomy may be required.

Shah et al. analyzed new therapeutic options for the embolization of intracranial meningiomas, as well as the future of meningioma treatment through recent relevant cohorts and articles. They investigate various embolic materials, types of meningiomas amenable to embolization, imaging techniques, and potential imaging biomarkers that could aid in the delivery of embolic materials. They also analyze perfusion status, complications, and new technical aspects of endovascular preoperative embolization of meningiomas. A literature search was performed in PubMed using the terms “meningioma” and “embolization” to investigate recent therapeutic options involving embolization in the treatment of meningioma. They looked at various cohorts, complications, materials, and timings of meningioma treatment. Liquid embolic materials are preferable to particle agents because particle embolization carries a higher risk of hemorrhage. Liquid agents maximize the effect of devascularization because of deeper penetration into the trunk and distal tumor vessels. The 3 main imaging techniques, MRI, CT, and angiography, can all be used in a complementary fashion to aid in analyzing and treating meningiomas. Intraarterial perfusion MRI and a new imaging modality for identifying biomarkers, susceptibility-weighted principles of echo shifting with a train of observations (SW-PRESTO), can relay information about perfusion status and degrees of ischemia in embolized meningiomas, and they could be very useful in the realm of therapeutics with embolic material delivery. Direct puncture is yet another therapeutic technique that would allow for more accurate embolization and less blood loss during resection.

Preoperative embolization has been an option for adjunctive treatment of intracranial meningiomas, but it remains used in only a minority of cases.

Case series

Case reports

A case of hemorrhage in a parasellar meningioma shortly after embolization of the dural cavernous carotid artery branches supplying the tumor. This represents the first report of hemorrhage within a meningioma resulting from embolization with small (50 to 150-microns) polyvinyl alcohol particles, as well as the first reported case of hemorrhage complicating meningioma embolization from internal rather than external carotid artery branch embolization. We also review previously reported cases of postembolization hemorrhage from meningiomas.
