

Bone invasion

Bone invasion is a major concern in [meningioma](#) surgery, since it is predictive of the recurrence of cranial involvement, morbidity, and mortality.

Bone invasion has been reported in 20%-68% of studies with histopathologically confirmed data. Unfortunately, radical resection of bone invasion remains challenging.

5-aminolevulinic acid (5-ALA) fluorescence in guiding the resection of bone-invading meningiomas was performed in 12 patients affected by bone-invading meningiomas (7 with skull base and 5 with convexity meningiomas) between July 2012 and March 2013 at the Department of Neurosurgery.

To evaluate the sensitivity and specificity of 5-ALA fluorescence in detecting meningioma tissue, a pathologist analyzed 98 surgical bone samples under blue light, according to different fluorescence patterns.

Magnetic resonance images and CT scans were obtained pre- and postoperatively to determine the extent of bone invasion resection.

The rate of 5-ALA-induced fluorescence of both tumor and bone invasion was 100%. Based on the pathological examination of bone specimens, 5-ALA presented a sensitivity of 89.06% (95% CI 81.41%-96.71%) and a specificity of 100% in detecting meningioma bone invasion, while the positive and negative predictive values were 100% and 82.93% (95% CI 71.41%-94.45%), respectively. At the postoperative stage, MRI did not detect cases of meningioma bone invasion, whereas CT scans revealed residual hyperostosis in 2 cases.

In summary, 5-ALA fluorescence represents a suitable and reliable technique for identifying and removing bone infiltration by meningiomas. However, further studies are needed to prove the clinical consequences of this promising technique in a larger population ¹⁾.

¹⁾

Della Puppa A, Rustemi O, Giofrè G, Troncon I, Lombardi G, Rolma G, Sergi M, Munari M, Cecchin D, Gardiman MP, Scienza R. Predictive value of intraoperative 5-aminolevulinic acid-induced fluorescence for detecting bone invasion in meningioma surgery. J Neurosurg. 2014 Jan 10. [Epub ahead of print] PubMed PMID: 24410157.

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