5-aminolevulinic Acid and Surgical Margin Analysis in Calvarial Metastasis with Pericranium or Dural Extension: Technical Note

ERASMO BARROS DA SILVA JÚNIOR, GUSTAVO SIMIANO JUNG, MARCELLA SANTOS CAVALCANTI, AFONSO HENRIQUE DE ARAGÃO, RICARDO RAMINA

Instituição: Instituto de Neurologia de Curitiba - INC

Metastasis to the calvarium with direct pericranium or dural infiltration may be treated with radical surgical removal in selected cases. We describe microsurgical resection of calvarial metastases with fluorescence-guided technique using 5-aminolevulinic acid (5-ALA) in two female patients with breast cancer. Fluorescence findings were positive in both cases. Margins in the scalp and dural layer were 5-ALA negative at the end of surgical removal. Intraoperative pathology was performed in all cases to confirm if oncological limits were free of disease. One case was 5-ALA positive in the outer layer of the dura-mater and another in the pericranium. At the end of the removal in both cases, the surgical margins were 5-ALA fluorescence-free. Intraoperative pathology confirmed oncological limits of the resection. 5-aminolevulinic acid fluorescence-guided surgery for calvarial metastases with pericranium and/or dural extension seems to be a safe and reliable method to aid the surgical margins for complete removal, possibly delaying or avoiding adjuvant irradiation for progression control

CONCLUSIONS: 5-aminolevulinic acid fluorescence surgery for calvarial metastases may provide a simple and reliable guide to determine the oncological limits with the pericranium and underlying dura-mater

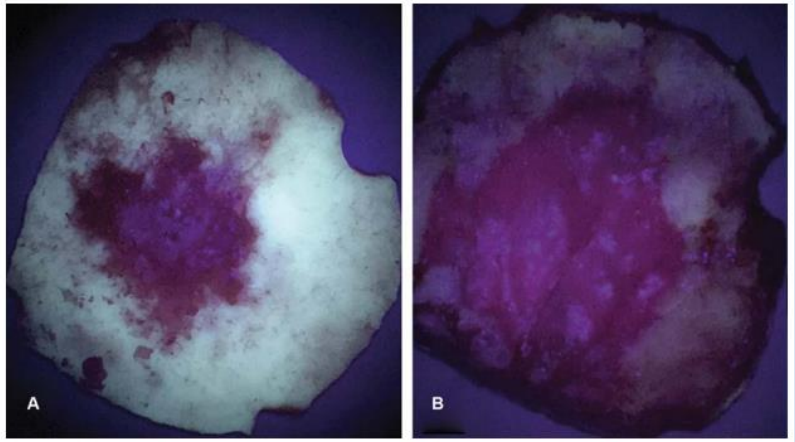

Fig. 1 Outer (a) and inner (b) table of calvarium inspected under blue light filter, showing lesion with a 5-ALA strong positiveness.

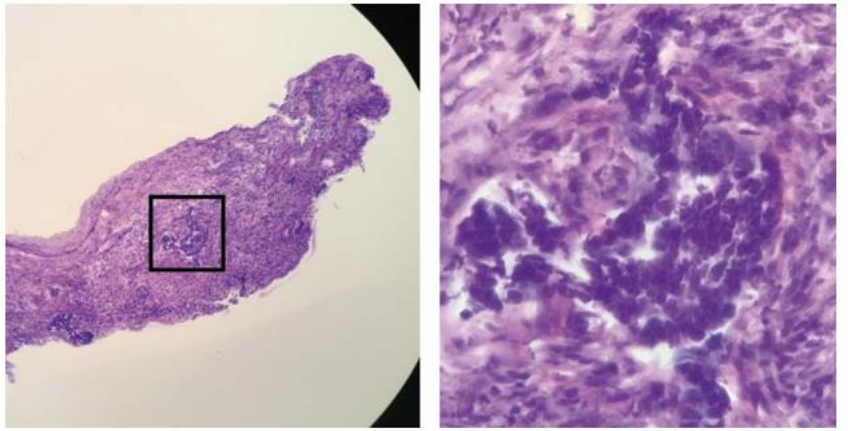

Fig. 3 Intraoperative pathology findings in 5-ALA positive outer dural margins, confirming tumor infiltration.

Fig. 2 Outer layer of dura-mater in direct contact with the mass inspected with the blue light filter, showing 5-ALA poor positiveness (a).

Table 1 5-aminolevulinic acid fluorescence and intraoperative pathology findings

Patient	Age (years old)/ Gender	Pathology	Tumor fluorescence	Pericranium fluorescence	Dura-mater fluorescence	Intraoperative pathology
1	33F	HER-2 negative, ER and PR positive	Strong	Negative	Outer layer: poor; Internal layer: negative	Pericranium negative; Bone tumor and outer dural layer positive; internal dural layer negative
2	40F	HER-2 negative, ER positive PR negative	Strong	Strong	Outer layer: negative; Internal layer: negative	Pericranium positive; Bone tumor positive; Dura-mater negative

Abbreviations: Her-2, human epidermal growth receptor 2; ER, estrogen receptor; PR, progesterone receptor.

Arquivos Brasileiros de Neurocirurgia Vol. 39 No. 3/2020

HOSPITAL INC INSTITUTO DE NEUROLOGIA DE CURITIBA