Intraoperative neuropsychological assessment in brain tumors ressection located at eloquent areas - Is it ethical not considering "awake surgery"?

Candice Steffen Holderbaum[1], Gustavo Rassier Isolan[1,2,3]

Brain tumors consist of a heterogeneous group of lesions with potential surgical morbidity when located in eloquente brain areas (motor area, language areas, visual areas, etc.) Although intraoperative neurophysiological monitoring has the potential to decrease the risk of sequelae (hemiparesis/hemiplegia) in surgeries with the patient under general anesthesia (primary motor cortex and subcortical motor tract), this modern armamentarium cannot be used to map the speech (the patient is anesthetized). This is particularly important in a large group of patients with low-grade gliomas located in or aroud language areas.

The resection of low-grade gliomas aims to remove the maximum amount of tumor tissue and prevent sequelae that may impair the patients' quality of life (1). However, given the slow growth characteristic of these tumors and the consequent functional reorganization obtained by brain plasticity, intraoperative measures need to be taken to locate eloquent regions, since the anatomy is not a reliable parameter. One of the important alternatives for determination of these regions is the realization of direct electrical stimulation of cortical and subcortical areas. This allows mapping some cognitive functions in patients under local anesthesia (through the reversible production of these transient disturbances functions).

In this context, the presence of a neuropsychologist is essential to properly assess the patient during stimulation. The neuropsychologist must know, for example, how to choose appropriate tasks and interpret the patient's responses for these transient disturbances. Protocols to test language are commonly used.

The language assessment intraoperatively includes two main tasks: automatic speech and naming. In automatic language, the patient is instructed to count from 1 to 10 several times until completed mapping. Regarding naming task, the patient is asked to name a series of pictures which he already named correctly during the preoperative evaluation. The disorders include anomie, paraphasias, dysarthrias, perseverations and slow response (2). The result of resections in this context demonstrates a transient worsening in the first weeks after surgery, followed by the return of previous ability before tumor resection (3).

Our group has systematically used intraoperative neurophysiological monitoring in most patients operated on with tumors in eloquent brain areas in the last seven years, but mapping the speech areas ("awake surgery") was started after the authors' returning from a fellowship observer at the Department of Neurosurgery at the Gui de Chauliac Hospital, Montpellier, two years ago (4). In our initial experience with 19 patients with brain tumors located in language areas, the quality of life of patients was preserved with an enlarged tumor resection (unpublished data) (5).

Clin Biomed Res. 2014;34(1):90-91

1 Serviço de Neuropsicologia do Centro Avançado de Neurologia e Neurocirurgia (CEANNE), Hospital Centenário. – São Leopoldo (RS), Brazil.

2 Centro de Tumores Cerebrais, Hospital Moinhos de Vento – Porto Alegre (RS), Brazil.

3 Serviço de Neurocirurgia, Hospital de Clínicas de Porto Alegre – Porto Alegre (RS), Brazil.

Corresponding author:
Candice Steffen Holderbaum
E-mail: candicebaum@gmail.com
Porto Alegre, RS, Brasil

The neuropsychological evaluation for intraoperative resection of low-grade gliomas has been an important tool for obtaining a glioma’s wide resection (even gross total ressection), decreasing the incidence of early recurrence and/or transformation to a higher degree of malignancy. Moreover, it enables the maintenance of cognitive skills. This is paramount because in the majority of the cases there are no neurological symptons prior to surgery.

Thus, we raise the debate regarding the urgency to include intraopeartive neurophysiological monitoring as an important tool in neurosurgical armamentarium in all neurosurgical departaments all over the world. And for starting this debate, our first question is, with this tool available,is it still ethical to resect tumors located in eloquent brain areas without intraoperative monitoring?

REFERENCES

1. Duffau H. The challenge to remove difuse low-grade gliomas while preserving brain functions. Acta Neurochirurgica. 2012;154:569-74.
2. Moritz-Gasser S, Herbet G. Language and other cognitive evaluations. In: Duffau H, editor. Diffuse low grade glioma in adults. London; 2013. p. 279-99.
3. Duffau H. Awake surgery for incidental WHO grade II gliomas involving eloquent areas. Acta Neurochirurgica, 2012;154:757-84.
4. Bai H, Wang W, Li T, He H, Shi C, Guo X, et al. Three core techniques in surgery of neuroepithelial tumors in eloquent areas: awake anaesthesia, intraoperative direct electrical stimulation and ultrasonography. Chinese Medical Journal . 2011;124:3035-41.
5. Sacko O, Lauwers-Cances V, Brauge D, Sesay M, Brenner A, Roux F. Awake craniotomy vs surgery under general anesthesia for resection of supratentorial lesions. Neurosurgery. 2011;68:1192-9.

Received: 29/01/2014
Accepted: 03/02/2014