



AS REPERCUSSÕES NEUROLÓGICAS DOS TUMORES NO ENCÉFALO, E A NECESSIDADE DE UMA ABORDAGEM INTERDISCIPLINAR ENTRE ONCOLOGIA E NEUROLOGIA NO DIAGNÓSTICO PRIMÁRIO

*The neurological tumors impact in the brain, and the need for an interdisciplinary approach between
oncology and neurology in primary diagnosis*

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ABSTRACT: Tumors in the encephalic region, although not the most prevalent among oncological processes, require extreme attention due to the complexity of their pathophysiology and the complexity of the area in which they are located. The importance of studies and multidisciplinary treatment for these types of cancer is due to the fact that tumor masses in the brain cause not only the physiological involvement inherent in the cancerous process but also the functional impairment of the nerve fibers belonging to the affected area. The aim of this study was to demonstrate, through a literature review, that tumor masses will not infrequently trigger symptoms such as hemianopsia, as well as other visual disturbances, hearing loss, paresis, aphasia, personality changes and other findings attributed to the neurological clinic. Thus, it is indispensable, besides the accurate clinical reasoning of the professional, sometimes even coming from the primary care, in order to perceive early signs of neurological involvement and, soon afterwards, the etiological findings (in this case the tumor) and their topographical definition. It is concluded that, from this point oncology will be the definition of the most appropriate treatment and neurology will indicate the preservation of the noblest areas, the understanding of the neurological repercussions and their eventual treatments. For sure, the therapy of the now analyzed condition runs through the help of many other professionals, like psychologists, but it is not, however, the target of this work

Keywords: Encephalic Cancer; Interdisciplinarity; Neurological Signs.

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Resumo: Tumores na região encefálica embora não sejam os mais prevalentes dentre os processos oncológicos, demandam extrema atenção pela complexidade atinente à sua fisiopatologia e à complexidade da área em que estão situados. A importância dos estudos e do tratamento multidisciplinar para esses tipos oncológicos deve-se ao fato de que massas tumorais no encéfalo acarretam não só no comprometimento fisiológico inerente ao processo cancerígeno, mas também no comprometimento funcional das fibras nervosas pertencentes à área acometida. Assim, objetivou-se demonstrar por meio de revisão bibliográfica que, não raramente, massas tumorais desencadearão sintomas como hemianopsia, bem como outros distúrbios visuais, hipoacusia, paresias, afasia, alterações da personalidade e outros achados atribuídos à clínica neurológica. Destarte, imprescindível se faz, além do acurado raciocínio clínico do profissional, por vezes até oriundo da atenção primária, a fim de que se perceba precocemente os sinais de acometimento neurológico e, logo em seguida a descoberta etiológica (no caso o tumor) e sua definição topográfica. Conclui-se que, a partir daí caberá então à oncologia a definição do tratamento mais adequado e à neurologia a indicação de preservação das áreas mais nobres, o entendimento das repercussões neurológicas e seus eventuais tratamentos. Por óbvio, a terapêutica da ora analisada afecção perpassa pelo auxílio de inúmeros outros profissionais, a exemplo de psicólogos, não sendo, no entanto, alvo do presente trabalho.

Palavras-chave: Câncer De Encéfalo; Interdisciplinaridade; Sinais Neurológicos.

INTRODUCTION

The encephalic neoplastic processes are defined as the abnormal proliferation of cells located in the brain, in which cells in mitosis are deprived of the possibility of differentiation; being that this impossibility arises from genetic modifications, with a consequence loss of regulation of cell growth³.

The incidence of new cases of cancer in Brazil is approximately 300 thousand new cases per year, when seeking the epidemiology of tumors affecting the Central Nervous System the number is about 5,600 new cases¹⁸.

There is a basic classification of tumors, according to their degree of aggression and which classify them as benign or malignant tumors⁶. However, beyond this less specific classification, several are the brain tumors, having the same, in general, names that allude to the cells of origin, for example gliomas (from the glia cells), astrocytoma (originated from astrocytes), oligodendrogliomas (from the Oligodendrocytes)⁸.

The involvement of brain tumors in this region can cause both signs and symptoms related to the tumor itself, as well as neurological problems resulting from neuronal compression promoted by the same. The presentation may vary from hydrocephalus, edema and functional impairment of the cranial pairs, although developments in neuroimaging techniques, especially the Magnetic Resonance Imaging have allowed the identification increasingly earlier of tumor masses, which contributes to reducing this type of evolution¹⁵.

In addition to the usual nuclear magnetic resonance, positron emission tomography, the magnetoencephalography and functional magnetic resonance constitute themselves as instruments able to investigate and topograph both tumors and fully functional cortical areas¹¹.

Another fundamental point in diagnosis is the evaluation of the index of anaplasia. Anaplasia assesses how dysmorphic or atypical structurally are the tumor cells, which provides clues to

conclude about their possibility of advancing¹⁰.

LITERATURE REVIEW

Tumors of the Central Nervous System, mainly in the brain, are defined as oncological disease highly burdensome for those who are affected. The severity, stems, in addition from 'the issues inherent to the proliferations and exacerbations of the own cancer, the nobility of the affected area, those who maintain connections and sometimes govern various systems of the human body.

The concern with the oncogenic processes that affect the brain region, is justified even more so when it comes to small areas, such as the brainstem, place of apparent origin (or real in the case of their nuclei) of several pairs of cranial nerves. Thus, any tumor mass that promotes local compression will result in nervous involvement regarding the affected nervous fibers. Precisely because of a small area giving rise to fibers of distinct nuclei, the possibility

of highly diversified semiological signs is not rare, with several sensory and motor presentations².

From the affected lobe it is possible to conjecture about the topographic diagnosis. Patients with tumors located in the frontal lobe may have personality changes, reduction of self-criticism, involvement in ambulation. In the temporal lobe aphasia symptoms are more recurrent, as well as seizures. In the parietal lobe they may be hemiparesis, anesthesia and reduction of perception. In the occipital lobe involvement, considering that primary visual area prevails in this region, visual impairments are recurrent clinical findings⁹.

When the affected area is the thalamus, there will also be a contralateral sensory changes, and the cognitive processes and of speech may also be changed. It is recalled that the thalamus not only leads content to the cortex, as well as modulate them, thus, any tumors in this region will compromise the preparation for the perceptual, stimulating and sensitive functions¹.

In addition, the clinic that points to memory deficits, functional

impairment of executions and gradual loss of attention, can also arouse in the examiner the possibility of existence of compressive masses at thalamic level ¹⁷.

When it comes to the brainstem as the affected area, the clinical statements will be correlated, as a rule, the disorders of pairs of cranial nerves, in addition to also being possible the occurrence of vomiting and hiccups, in reference to the centers of vomiting and the others ².

Besides the reasoning by topography, one can be attentive to oncologic processes from various other signs, even the clinic of patients diagnosed as epileptic may suggest the presence of tumors, when existing focal and intracranial hypertension signs. The suspicion gains strength when post-critical palsies are observed, modification of patterns of crisis or ineffectiveness of the elected medicamentous treatment ⁷.

As it is possible to observed the set of semiological signs and symptoms is rich, demanding a reasoning and an interdisciplinary approach, associating neurological, oncologic knowledge, accuracy in the analysis of the images and of laboratory findings.

The great current challenge of neuro-oncology is to reach at the tumor as far as possible the area for resection,

as well as the maximum preservation of the cerebral parenchyma. For areas as microscopically noble as it is the case of brain and brainstem, achieving the oncologic outcome safe and feasible without impairment is extremely difficult ¹².

Precisely the difficulty above explained is what justifies the need of deep interaction and knowledge of both areas. Professionals who know well neurological and oncological signs in an early stage guarantee an early action, and therefore with a smaller range of damages.

Moreover, in a first moment, a large proportion of patients presents the motor cortex intact. Thus, the importance of early diagnosis and well-planned extirpation techniques, in order to preserve the healthy areas. ¹⁶

Both the symptomatologic set, as the treatment to be chosen depend on the area of the Central Nervous System that is being affected by the tumor. Thus, the treatments and prognosis are varied, once more demanding interdisciplinary analysis.

The most frequent cancer treatments make use surgical techniques, in order to eradicate the tumor and decrease the compression; chemotherapy, immunotherapy and radiation therapy ¹⁴.

Such a quantity of structures and

functions of sensory, motor and cognitive symptoms involved along the tumor, that when the treatment option is surgery, many times the procedure is performed with the patient awake. The vigilance state is maintained so that it is possible to assess, by stimulation, which areas are involved in the resection, seeking the greatest possible preservation of functional areas ¹³.

CONCLUSION

The importance of correlating the areas of oncology and neurology refers to the fact that tumors that affect the nervous system lead to a clinical characteristic and knowing how to trace the correct semiological reasoning can help in the early discovery of tumor masses that affect nerve structures.

After the analysis of the signs and symptoms and the attempt to correlate them to the involvement of a particular area of the brain, imaging exams may confirm the topography and the extension.

A multidisciplinary approach is crucial to facilitate the choice of the most appropriate treatment to attempt

the tumor extirpation with maximum preservation of quality of life, which permeates the preservation of noble areas that will eventually surround the tumor mass.

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REFERENCES

1. AGLIOTI, S. *The role of the thalamus and basal ganglia in human cognition*. *Jornal of Neurolinguistics*, v. 10, n.4, p. 255-265. 1997
2. CAMPBELL, W. *O exame neurológico*. 7.ed. Rio de Janeiro: Guanabara Koogan, 2014.
3. CASSIDY, J. Bisset. Et al. *Oxford handbook of oncology*. Oxford University Press.2002.
4. DOMINGUES, M. et al. *Impacto da reabilitação*

- Neuropsicológica nas neoplasias encefálicas da criança: estudo de caso. Journal of Child and Adolescent Psychology, v.5, n.1, p. 165-175, 2014*
5. FERRO, J. et al. *Neurologia Fundamental: princípios, diagnóstico e tratamento. Porto: Lidel. 2013*
 6. FLOWERS, A. *Brain tumors in the older person. Cancer Control, v. 7, p. 523-538, 2002*
 7. LIMA, P. T., et al. *Epilepsia parcial associada a tumores cerebrais primários. Arq. Neuro-Psiquiatria, v.60, n.3B, p. 211-223, São Paulo, setembro, 2002*
 8. LOUIS, D. et al. *The who classification of tumors of the central nervous system. Acta Neuropathologica. v. 114, n.2, p. 97-109, 2007*
 9. MACHADO, Ângelo. *Neuroanatomia funcional. 3ed. Rio de Janeiro: Ed Atheneu.2013*
 10. MASTRANGELO, S. et al. *Two cases of pediatric high-grade astroblastoma with different clinical behavior. Tumori, v. 96, p. 160-163, 2010*
 11. MCDONALD, J. et al. *Integration of preoperative and intraoperative functional brain mapping in a frameless stereotactic environment for lesions near eloquent cortex. Technical note. J Neurosurg. v. 90, p 591-598, 1999*
 12. OLIVEIRA, et al. *Schwanoma gigante do viii nervo craniano de evolução subaguda: relato de caso. Rev Bras Neurol. v. 52, n. 3, p. 29-33, 2016*
 13. RIBAS, E. et al. *Tractografia: Definição e Aplicação na Ressecção de Tumores Cerebrais. Arquivo Brasileiro de Neurocirurgia. v. 30, n.1, p. 30-33, 2011*
 14. SANTOS, M. et al. *Dexmedetomidina para teste neurocognitivo em craniotomia com o paciente acordado: relato de caso. Revista Brasileira de*

- Anestesiologia, v. 56, n.4, p. 402-407, 2003
15. SAWADA, O. et al. *Avaliação da qualidade de vida de pacientes com câncer submetidos a quimioterapia*. Revista Esc de enfermagem USP. São Paulo, v.43, n.3, setembro, 2009.
16. WITWER, B. et al. *Diffusion-tensor imaging of white matter tracts in patients with cerebral neoplasm*. J Neurosurg. v. 97, p. 568-575, 2002
17. WERF, V. et al. *Deficits of memory, executive functioning and attention following infarction in the thalamus: a study of 22 cases with localized lesions*. Neuropsychologia, v. 41, n.10, p. 1330-1344, 2003