Review of Intracranial Meningioma in North Sumatera

Ridha Dharmajaya[1]
[1]*Department of Neurosurgery, Universitas Sumatera Utara, Medan, Indonesia*

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Abstract: Meningioma, also known as meningeal tumor, is typically a slow-growing tumor that forms from the meninges, the membranous layers surrounding the brain and spinal cord. Risk factors include exposure to ionizing radiation such as during radiation therapy, a family history of the condition, and neurofibromatosis type 2. The goal of management strategy in meningiomas is to keep the patient fully functional and provide long-term relief or prevent intracranial tumor growth associated problems.

1 INTRODUCTION

Meningiomas has attracted the attention of surgeons, anatomists, pathologists, and physicians for many centuries. Given the tendency of these neoplasms to cause thickening of the overlying calvarium, meningiomas have left an unmistakable mark on human skulls dated as far back as prehistoric times. Harvey Cushing coined the term meningioma in 1922 to describe a benign neoplasm of the meninges of the brain.

However, many other surgeons and pathologists described and named this neoplasm as well. In fact, naming of the tumor likely represents one of the most frequently changed nomenclatures in the history of medicine. Antoine Louis, born in Metz, France, in 1723 into a family of surgeons, developed an interest in surgery of dural tumors, which he named tumeurs fongueuses de la duremere or fungoid tumors of the dura mater. He included their description in Memoire de l'Académie Royale de Chirurgie in 1774. In 1854, Sir James Paget named the neoplasm myeloid tumor (marrow like), based on its gross appearance and less malignant behavior.

In 1863, Virchow was the first to describe the granules in these tumors and named it psammoma (sand-like). As Virchow was uncertain of the origin of these bodies, he gave the neoplasm a descriptive name. Subsequently, he changed the nomenclature from psammoma to Sarkoma der dura mater to describe these tumors.

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2 PATIENTS AND METHODS

This was a retrospective study carried out at the Haji Adam Malik General Hospital serve as teaching hospitals of the University of the Sumatera Utara, The study was over a period of 6 years (January 2013 – December 2017). Haji Adam Malik General Hospital is located within the city centre in Medan, North Sumatera as one of the referral hospitals for Provincial Hospitals in Indonesia.

Consecutive patients seen at the this hospital with histologically proven intracranial meningioma during the study period were recruited for the study. We obtained data from the medical record. Diagnosis was made after detailed history and careful physical examination, neuroimaging including CT scan and or MRI, and histological confirmation. All patients who underwent neurosurgical operative intervention had specimens removed at operative intervention and subjected to histology for a final tissue diagnosis. Patients who had non-operative intervention were taken off the study due to the absence of a final histological diagnosis data.

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3 RESULTS

During the 6 years study period, 171 consecutive patients (out of 370 patients with primary brain tumours) seen at Haji Adam Malik General Hospital had histologically confirmed intracranial meningioma with a hospital distribution of Frequency of distribution of intracranial meningiomas among primary brain tumours.

A total 171 patients records were reviewed, which were diagnosed by histophatological reports in the preiod between January 2013 – December 2017 seen in table.1. There were 52 (30.4%) in male patients and (69.5%) in female patients. The age of patients range from 1 to 68 years. The highest number of patients was seen in the age-group of 40-59 years in males and 20-39 years in females in table 2. The histopathologic report intracranial meningiomas based on WHO claasifications showed Meningothelial meningioma is the most common histopathology type in 70 patients (40.9%) in table.3. WHO Grade 1 is the most histological subtypes based on WHO classifications seen in 131 patients (76.6%).

Table 1. Frequency of distribution of intracranial meningiomas among primary brain tumours

Tumor Types	N	%
Meningiomas	171	45.9
Metastatic Brain tumor	76	78,1
Gliomas	59	15.9
Pituitary	21	5.6
Tumor of Nerves and/ or Nerve Sheath	17	4.5
PNET	13	3.5
Cysta	6	1.6
Other, more bening pituitary tumor	5	1.3
Pineal tumor	1	0.2
Other primary tumors, including skull base	1	0.2
Total	**370**	**100.0**

Table 2. Age of patients at presentation intracranial meningiomas

Age Group	Gender	
	Males	Females
0-19 years	4 (7.69%)	18 (15.1%)
20-39 years	12 (23.07%)	40 (33.6%)
40-59 years	21 (40.3%)	32 (26.8%)
> 60 years	15 (28.8%)	29 (24.3%)
Total	**52 (30.4%)**	**119 (69.5%)**

Table 3. Histopathology presentation intracranial meningiomas based on World Health Organization (WHO) Classification.

Histopathology	N	%
Meningothelial	70	40.9
Transitional	19	11.1
Fibroblastic	21	12.2
Clear Cell	9	5.2
Anaplastic	12	7.01
Atypical	9	5.2
Malignant	10	5.8
Metaplastic	11	6.4
Psammomatous	10	5.8
Total	**171**	**100.0**

Table 4. Distribution of intracranial meningiomas based on World Health Organization (WHO Grading)

Histopathology	N	%
WHO Grade 1	131	76.6
WHO Grade 2	18	10.5
WHO Grade 3	22	12.86
Total	171	100.0

4 CONCLUSION

The goal of management strategy in meningiomas is to keep the patient fully functional and provide long-term relief or prevent intracranial tumor growth associated problems. The clinical picture at presentation is very variable, and very little is known regarding the natural history of these tumors; therefore the management strategy is not universal. The initial dilemma that the surgeon faces starts with the decision to treat or not to treat. Only then is this followed by the decision of how to treat. Both decisions are taken together with the patient and the surgeon plays the role of an advisor, rather than directly deciding for the patient.

Treatment choice in patients who present to medical attention for the first time with a symptomatic meningioma or in those with neural compression is mostly straightforward. The goal is well defined and the possible gains most commonly far outweigh the risks. However; decision making is not so easy in non- or marginally symptomatic patients, for whom the risks of treatment should be weighed against the risk of iatrogenic injury. The mortality and morbidity of surgical treatment decreased significantly and continuously in the last century, mainly as a result of the application of microsurgery, bipolar coagulation, and other new technologies. A better appreciation of microsurgical anatomy and increasing use of skull-base surgery have further improved results. The advent and popularization of alternative treatment modalities such as radiation treatment and radiosurgery have also made significant contributions. Finally, with accumulating experience and scientific data much more is known today about the biology of meningiomas.

Even with all these advances, today's neurosurgeon still has very little clinical evidence on which to base his or her clinical decisions. This chapter aims to summarize the controversies, discussing different management paradigms and thus providing a general guideline for treatment (or nontreatment) of meningiomas. Five factors influence the treatment decision in meningiomas: operative gains, operative risks, tumor biology, mass effect/symptomatology, and the preference of the patient. In short, the balance between the risks and benefits of surgery is evaluated in light of the tumor's biology, mass effect/symptomatology, and preference of the patient.

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