Cerebral Vasospasm Following Tumor Resection: Systematic Review of the Literature

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Introduction

Cerebral Vasospasm a well-known complication that can follow subarachnoid hemorrhage, and traumatic brain injuries. Rarely, vasospasm can occur as a post-operative complication of tumor resection, more specifically after pituitary and skull base surgery. A high-index of suspicion is necessary to diagnose this uncommon but potentially disabling complication before permanent deficit ensue.

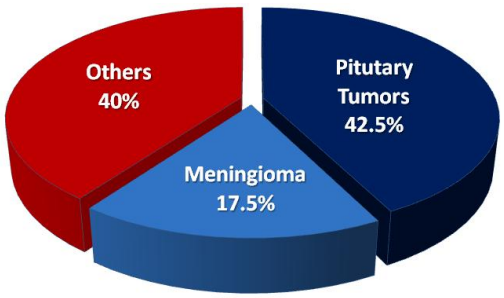
Methods

A literature search was performed using relevant search key words to identify cases of "cerebral vasospasm" as a complication following tumor resection. Articles were identified by searching MEDLINE® and PubMed® databases. Relevant cross-references were added by manually searching the references of all retrieved articles. Cases were included in our analysis only if patients are symptomatic and had enough clinical and radiological data.

Results

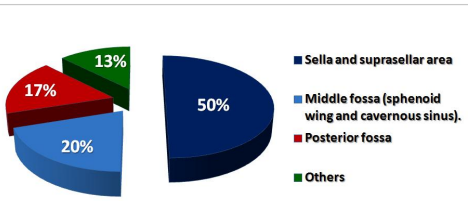
There were a total of 56 patients in our initial search; but only 40 cases matched our inclusion criteria. Pituitary tumors and sellar area were the most common pathologies and location associated with this complication. Average time interval to development of symptomatic vasospasm was eight days and the mortality was high, 30%. The most common encountered causative factors were vascular factors and presence of blood in basal cisterns in post-operative scans.

Figure 1



Type of tumor pathologies involved in vasospasm.

Figure 2



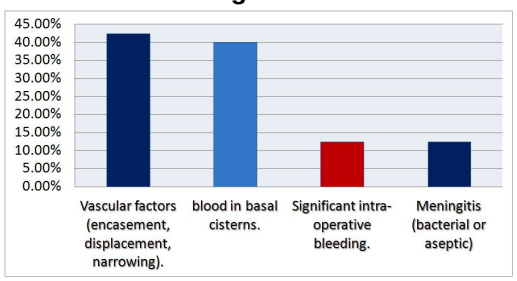
Location of Tumors

Table 1

Characteristics	Patients (N=40)
Age in years (mean)	1 - 69 year (*41 year*)
Gender	
Male	24 (60%)
Female	16 (40%)
Surgery	
Craniotomy	29 (72.5%)
Trans-sphenoidal	11 (27.5 %)
Time Interval in Days (Mean)	0-30 Days (8)
Spasm location	
Anterior Circulation	29 (72.5%)
Posterior Circulation	1 (2.5%)
Both	10 (25%)
Vasospasm of vessels in the same surgical site (Only for craniotomy cases) - N=29	19 (65.5%)
Outcome	
Incomplete recovery	17 (42.5%)
Complete recovery	11 (27.5%)
Death	12 (30%)

Data of 40 cases that matched with our inclusion criteria

Figure 3



Most encountered causative factors in the literature

Conclusion

"Cerebral Vasospasm" after tumor resection is a rare and challenging vascular phenomenon. Vasospasm following brain tumor surgery shares some of the same clinical variables (time interval, causative factors, morbidity, and mortality rates) of vasospasm after aneurysmal subarachnoid hemorrhage. Early diagnosis and prompt management is a key element in final outcome.

Learning Objectives

By the end of this session, participants should be able to discuss possible etiologies, diagnosis and management of this complication.

References

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- Rabinstein AA, Lanzino G, Wijdicks EF. Multidisciplinary management and emerging therapeutic strategies in aneurysmal subarachnoid haemorrhage. Lancet Neurol. May 2010;9(5):504-519.