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The Primary Management of Meningiomas

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Abstract:
Meningiomas are the most common primary brain tumors in adults and are therefore relevant for general practitioners. Most of them are benign, but atypical and anaplastic require multimodal treatment strategies including postoperative radiotherapy. These high grade tumors depend mainly on age and gender of the patient. Most studies support that radiation and surgery therapy reduces recurrence risk and improves overall survival for patients with high-grade meningiomas.

Introduction:
A meningioma is a tumor that arises from a layer of tissue (the meninges) that covers the brain and spine**.** Meningiomas grow on the surface of the brain (or spinal cord), and therefore push the brain away rather than growing from within it. Most are considered "benign" because they are slow-growing with low potential to spread. Meningioma tumors can become quite large. Diameters of 2 inches (5 cm.) are not uncommon. Meningiomas that grow quickly and exhibit cancer-like behavior are called atypical meningiomas or anaplastic meningiomas, and are fortunately rare. Meningiomas represent about 20 percent of all tumors originating in the head and 10 percent of tumors of the spine. About 6,500 people are diagnosed with meningiomas each year in the United States. This type of tumor occurs more frequently in people with a hereditary disorder called neurofibromatosis type 2 (NF-2).[1] But, how do we manage this disease? In this report, we are going to establish the primary management of meningioma.

Discussion:
Meningiomas are the most common primary brain tumors in adults and are therefore relevant for general practitioners. Most meningiomas are benign and neurosurgical resection offers the best chance of cure. However, complete resection is not achievable in many patients. This accounts for a relevant rate of tumor recurrences within 15 years of follow up. In atypical and anaplastic meningiomas of World Health Organization (WHO) grade II and III time to recurrence is dramatically shorter and these tumors need multimodal treatment strategies including postoperative radiotherapy. Various systemic treatments have occasionally been used as salvage therapy, but were essentially not effective. Only recently, Sunitinib, a small thyrosine kinase inhibitor as well as bevacizumab, a therapeutic antibody, have shown more promising results in highly pretreated, refractory meningioma patients.[2] Meningiomas are the most prevalent primary tumor of central nervous system origin and, although most neoplasms are benign, a small proportion exemplifies an aggressive profile characterized by high recurrence rates, pleomorphic histology, and overall resistance to standard treatment. Standard initial therapy for malignant meningiomas includes maximal safe surgical resection followed by focal radiation in certain cases. The role for chemotherapy during recurrence of these aggressive meningiomas is less clear. Prognosis is poor and recurrence of malignant meningiomas is high.[3] Meningiomas account for approximately one-third of primary central nervous system tumors with a subset that are aggressive and carry significant morbidity and mortality. Treatment of these high-grade meningiomas typically includes the combination of surgery and radiotherapy. However, current data guiding the timing, dosage, and modality of radiation treatment (RT) has been limited to case series and retrospective studies. Nevertheless, most studies support that radiation therapy reduces recurrence risk and improves overall survival (OS) for patients with high-grade meningiomas.[4]

A study was conducted for the treatment patterns and survival outcomes by patient age, Analysis of the National Cancer Database (NCDB) yielded 3611 atypical meningioma patients treated between 2008 and 2012. Principal treatment paradigms included surgery with or without radiation. The Results concluded with an Overall 5-year survival rate was 77.6% and declined with increasing patient age. Five-year survival for patients ≤ 45 years undergoing surgery alone was 89.3 vs. 44.4% for those > 75 years. For patients undergoing surgery with adjuvant radiation, 5-year survival was 93.7% in those ≤ 45 years and 54.1% in those > 75 years.[5]

Another study was conducted to experience with the management of 126 patients with atypical or malignant meningiomas from January 2001 to August 2011. 89 atypical and 37 malignant meningioma treatments with surgical excision (total excision in 97 patients) with some followed by postoperative irradiation (66 patients). These patients were followed clinically for 2 to 8 years. The conclusions of the study are the following: (1) patients with secondary tumors have a much shorter progression-free survival (PFS) than those with primary tumors in the malignant group, (2) the malignant meningioma patients had a reduced overall survival, and (3) PFS in patients with malignant meningiomas who received postoperative radiotherapy is longer than those who did not receive radiotherapy.[6]

In this final study, a cohort study was conducted using clinical data of all patients treated for meningiomas with atypical/anaplastic histology at first recurrence between January 1985 and July 2014 at a tertiary cancer center. Predictors of second recurrence were analyzed using competing risks regression models. The results showed that Nine hundred eighteen patients with meningioma that were screened, of whom 60 (55% female) had recurrent disease with atypical/anaplastic histology at a median age of 58 years at diagnosis. The median follow-up from the time of first recurrence was 36 months, with 32 (53%) patients alive at last follow-up. There was no effect of extent of resection at first recurrence on time to a subsequent recurrence. Inclusion of radiation as primary or adjuvant therapy at first recurrence reduced the risk of progression or subsequent recurrence compared to surgery alone.[7]

Conclusion:

The management of these meningiomas is only possible through surgery and radiotherapy, and although the treatment of recurrent meningiomas with atypical/anaplastic histology remains challenging, it is still possible. And this report shows that age and gender have a significant factor in contributing to this disease, especially for its survival rate.

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