

Meningiomas: A Guide for Nurses and Other Health Care Professionals

Understanding these brain and spinal tumors while promoting optimum care for your patients.

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Many nurses, physical therapists, occupational therapists and other members of the medical team have little knowledge about meningiomas, the most common variety of primary brain tumor. According to the Central Brain Tumor Registry of the United States (CBTRUS), meningiomas comprise over 27% of primary brain tumors, those that originate in the central nervous system. Meningiomas are the only variety of central nervous system tumor that is more common in women than in men (by at least a 2:1 ratio). Although these tumors are more common in midlife, they can affect people at any age. While the majority of meningiomas are histologically categorized as benign, that term is certainly misleading. Unlike benign tumors elsewhere in the body, benign intracranial tumors can cause severe brain injuries and death. Epidemiological studies indicate that benign meningiomas have an estimated five-year survival rate of 70%, a rate that is lower than the comparable five-year survival for breast cancer. Even after successful treatment, meningiomas often reoccur and may cause grave neurological deficits. Like other varieties of brain tumors, meningiomas occur in healthy people without any risk factors. There is no way to prevent these tumors or predict who will develop them.

At the present time, the incidence rate of meningiomas in the United States can only be estimated because mandatory reporting of all brain tumors has not been instituted. On October 29, 2002, the Benign Brain Tumor Cancer Registries Amendment Act became a law, requiring that individual state cancer registries collect data about all varieties of primary brain tumors. Several years will be needed to collect and analyze enough data to determine comprehensive statistics. Meanwhile, estimates have been constructed using data from those states that have been collecting benign brain tumor information. Even from these limited numbers, it is clear that meningiomas present a significant threat to life and health.

Diagnosis and Common Presentations

Initial diagnosis of a meningioma may be challenging. Because these tumors arise from the meninges, the delicate membrane that covers the entire brain and spinal cord, meningiomas can present with numerous symptoms. In many cases, meningiomas appear to grow slowly, which allows the adjacent brain tissue to gradually adapt to compression. When this slower growth occurs, some meningiomas can expand to be significantly large lesions (>5 cm.) and yet remain asymptomatic. With the increased availability of MRI scans and other diagnostic imagery techniques, a greater number of meningiomas are now diagnosed as incidental findings. If those meningiomas remain asymptomatic and do not present an immediate threat to life or health, they may be monitored with annual (or more frequent) follow up scans. In contrast, other meningiomas are diagnosed from imaging studies performed to identify the source of seizures, headaches, visual changes or other manifestations.

Meningiomas can produce symptoms in different ways, including compression of the brain or cranial nerves, vascular injuries or irritation of the cortex that can lead to seizure activity. In some cases, the location of the tumor may be associated with specific neurological symptoms. However similar symptoms may result from other conditions and are not necessarily associated with any brain tumors. Effective neuroimaging is an essential part of any differential diagnosis for meningiomas and other intracranial tumors. In most cases, MRI scans with contrast provide the diagnostic information needed. When MRI scans are contraindicated or when hyperostosis occurs, CT scans may also be useful.

Among the frequent symptoms that may be caused by meningiomas are seizures, headaches, muscle weakness, confusion, changes in personality, and visual disorders. Because other diseases can cause similar symptoms, misdiagnosis is common prior to identification of the tumor through diagnostic imaging. Unfortunately, particularly among mid-life women (who are statistically most likely to develop these tumors), vague symptoms may be ascribed to menopause or to illnesses such as endocrine disorders, depression, or autoimmune disorders.

In some cases, the association between specific symptoms and a meningioma may not be clear until after the tumor has been surgically removed. If symptoms disappear after treatment, their connection to the tumor may be implied. Nurses who are familiar with possible meningioma symptoms, the importance of diagnostic imaging when a meningioma is suspected, and appropriate treatment options can provide an important link in patient education about these tumors.

Choosing Treatment Options

Determining the optimal treatment for a meningioma depends on several factors. These include:

patient's age

overall health

the size of the meningioma (certain types of focused radiation treatments can only be utilized for smaller tumors)

meningioma location (regarding both surgical access to the tumor, and potential damage to adjacent cranial nerves or other critical areas of the brain)

the availability of neurosurgical and radiation therapy services near the patient's home

the patient's ability to travel to a specialized brain tumor center

the patient's personal preference for treatment

Meningiomas and their treatments may lead to neurological deficits that require rehabilitation. In some cases, a patient is well enough to go home after treatment, but still needs assistance with activities of daily living. It is important to review your patient's living arrangements and family situation to determine if additional home health care or other kinds of support may be needed.

Neurosurgery and Pathology

Conventional neurosurgery is an effective treatment for most meningiomas. For selected cases, neurosurgery can be performed using minimally invasive procedures. These include image guided surgery, transsphenoidal surgery and endoscopic procedures. Image guided surgery is available in many medical centers, including some which offer intraoperative MRI units. This technology allows the neurosurgeon to accurately navigate during complex intracranial procedures; the tumor can be precisely localized. Depending on the complexity of the surgical procedure, the patient's state of health and any potential complications, it is often possible to treat meningiomas during a short period of hospitalization (2 to 4 days). In other cases, meningioma surgery may be followed by rehabilitation in a specialized facility. Overall, surgery offers the best initial therapy for most meningiomas. It is important, however, that it be done in a center that has a complete understanding of these tumors.

Pathological examination of meningiomas can provide information that may be helpful in planning further treatment. This includes identifying histological classification by subgroup, the presence or absence of hormone receptors, and grade of malignancy. Although most of these tumors are classified as benign, some are identified as atypical or malignant meningiomas. When benign meningiomas reoccur after treatment, they may develop as higher-grade tumors. Atypical and malignant meningiomas are characterized as having an increased rate of growth and higher likelihood of recurrence when compared with benign meningiomas. Meningiomas do not usually metastasize outside of the nervous system. In extremely rare cases, meningiomas can metastasize (most commonly to the lung). Even within the confines of the brain and spinal cord, malignant meningiomas may be especially resistant to treatment. Because of the threat of recurrent growth of any variety of meningioma, follow up MRI and/or CT scans are an integral part of the lifelong health care for persons who have been diagnosed with these tumors.

A patient's positive expectations about surgery and faith in his or her surgical team can promote an optimal postoperative recovery. Whether patients are anxious about impending neurosurgery or confident of a hopeful outcome, nurses and other members of the medical team can encourage their patients to ask questions and to freely discuss their feelings about meningioma treatment.

Radiation, Chemotherapy, and Observation

Radiation therapy (RT) may be used as an adjunctive treatment for meningiomas. It is also used as treatment for recurrent meningiomas, especially when repeated craniotomies present significant risks. Certain types of focused radiotherapy are known by the names of the medical systems used for these procedures. LINAC radiation or Gamma Knife (GK) are examples of treatments which utilizes a single episode of focused radiation. Other types of focused radiotherapy include IMRT (intensity modulated radiation therapy), Fractionated Stereotactic Radiosurgery (FSR, a series of smaller doses of concentrated radiation) and Proton Beam (heavy particle radiation therapy).

Chemotherapy has been used for individual recurrent meningiomas, but it is less commonly administered to treat these tumors as compared to other varieties of brain tumors. It does not offer significant help at present. Several clinical trials are underway which may identify effective agents that could be more widely utilized as a treatment option for meningiomas.

When small meningiomas are asymptomatic, patients may be advised to pursue sequential imaging studies as a short or long-term approach. If an asymptomatic meningioma does not appear to be growing, this "watch and wait" technique may eliminate the risks from neurosurgery or radiation treatments. This option may also be used in elderly patients and those with chronic diseases who are not candidates for immediate intervention. In all cases, the potential risks and benefits for any type of meningioma treatment must be evaluated on an individual basis.

Treatment Risks and Follow-up Care

Intracranial neurosurgery presents risks of cerebral edema, bleeding and infection. Rates of perisurgical morbidity and mortality vary among different neurosurgeons and various hospitals. Postoperative nursing care, both in hospital and through visiting nurse services after discharge can help identify early signs of complications during the healing process. Particularly in the 24-hour period immediately following intracranial surgery, evaluations of neurological status can provide useful information leading to early intervention if complications occur. Even after recuperation from neurosurgery, changes in patients' neurological status are important to monitor.

Some possible signs of acquired brain injury include:

- short term memory loss
- aphasia or other speech disorders
- hypersensitivity to light, sound, touch
- vestibular disorders
- attention and concentration difficulty
- changes in behavior or emotional functioning

Resources are available to help patients with mild to moderate brain injury. It is important to encourage your patients to pursue whatever type of rehabilitation services that may be helpful to their recovery.

Psychosocial Effects of Meningiomas and Treatment

The experience of being diagnosed with a brain tumor can profoundly alter an individual's sense of self. Especially for men and women who have been previously healthy, confronting a potentially life threatening condition can be emotionally traumatic. Individual counseling, group psychotherapy and creative arts therapies (i.e., dance therapy, music therapy, art therapy, etc.) can be important ways for patients to express their emotional reactions to this life changing experience. Many patients benefit from brain tumor support groups, where they can meet others who have similar concerns and share their feelings with one another. Online brain tumor support groups offer an alternative resource for people who are confined to home, or who do not live close to an area where conventional brain tumor support groups are located. Online support is available 24 hours a day, seven days a week, and this constant access to communication can be very comforting.

Family members and friends of meningioma patients may have difficulty coping with this illness. Misunderstandings about the serious nature of these tumors are common. People may avoid offering needed support, thinking that this "benign" tumor is not serious. Nurses and other health care professionals can help educate family members or other concerned individuals about these common myths:

MYTH: Benign brain tumors are not serious.

FACT: Any brain tumor can have potentially serious complications.

MYTH: Meningiomas can be cured by surgical removal.

FACT: While complete surgical excision can promote a long period of remission, recurrent tumors are still a threat. Long-term follow up is important.

MYTH: Large meningiomas cause more damage than small meningiomas.

FACT: Many things (including the location of the tumor) affect the amount of neurological damage associated with a meningioma. A large tumor may be asymptomatic while a tiny meningioma in a delicate area (such as adjacent to the optic nerve) may cause permanent neurological damage.

MYTH: Follow up care is only needed for a short time after treatment.

FACT: Recurrent meningiomas can develop years and even decades after an initial tumor. Anyone with a history of meningioma should receive regular follow up diagnostic imaging as part of his or her lifelong health care.

MYTH: Meningiomas can be prevented.

FACT: Although brain tumors of any variety cannot be prevented, early detection through diagnostic imaging can identify new or recurrent tumors at a smaller size. In some cases, this allows for additional types of treatment options to be considered.

Providing Information and Support to Patients

Throughout the continuum of meningioma diagnosis, treatment and recuperation, nurses, therapists, and other members of the medical team can have an active role in educating patients while providing encouragement and compassion. In addition to different types of individual or group therapy, online and in-person support groups, the following resources can also be useful to your patients:

- charitable organizations that provide free materials and services to brain tumor patients and family members

- educational publications about brain tumors
- patient advocates
- brain tumor conferences and events

You can help patients adjust to a meningioma diagnosis by encouraging them to be proactive about their own health care. Getting a second opinion – or even two or three additional opinions – about treatment options may be indicated in challenging cases. Making a decision about neurosurgery, radiation therapy or other meningioma treatments is not an easy choice. Providing reassurance to your patients and helping them find additional guidance can be especially meaningful. After treatment, you can promote increased quality of life for your patients by helping to develop plans for their follow up care, including assessment of the need for various types of rehabilitation services.

Until the time when meningiomas can be prevented, patients with this diagnosis will confront the ever-present possibility of recurrent tumor growth and the need for additional treatment. Adjusting to this diagnosis as a chronic concern means that patients must be responsible for getting future follow up diagnostic scans, and for being aware of neurological symptoms that might indicate a recurrent meningioma. Early detection of any meningioma allows the best probability for successful treatment and recovery. With appropriate support from you and other members of their medical team, meningioma patients can be encouraged to live each day fully to the best of their ability.

RECOMMENDED READING

A Primer of Brain Tumors: A Patient's Reference Manual (25th anniversary edition), American Brain Tumor Association, Des Plaines, IL

Color Me Hope: A Resource Guide for People Affected by Brain Tumors, The Brain Tumor Society, Watertown, MA

Akagami R, Napolitano M, Sekhar LN, 'Patient-evaluated outcome after surgery for basal meningiomas,' *Neurosurgery*. 50(5):941-8; discussion 948-9. May 2002.

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<http://www.brainsciencefoundation.org>

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Additional copies of this booklet are available by contacting:

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Department of Neurosurgery
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For more information about brain tumors, contact these charitable organizations :

American Brain Tumor Association

2720 River Road
Des Plaines, IL 60018

Toll free: 800-886-2282
Voice: 847- 827-9910
Fax: 847-827-9918
<http://www.abta.org>

Brain Tumour Foundation of Canada

620 Colborne Street, Suite 301
London, ON N6B 3R9
Canada
Voice: 519-642-7725
Fax: 519- 642-7192 <http://www.braintumour.ca>

The Brain Tumor Society

124 Watertown Street, Suite 3-H
Watertown, MA 02472
Toll free: 800-770-8287
Voice: 617- 924-9997
Fax: 617-924-9998
<http://www.tbts.org>

Central Brain Tumor Registry of the U.S.

3333 West 47th Street
Chicago, IL 60632
Voice: 630-655-4786
Fax: 630- 655-1756
<http://www.cbtrus.org>

The Healing Exchange BRAIN TRUST

T.H.E. BRAIN TRUST
186 Hampshire Street
Cambridge, MA 02139-1320
Toll free: 877-252-8480
Voice: 617- 876-2002
Fax: 617- 876-2332 <http://www.braintrust.org>

National Brain Tumor Foundation

22 Battery Street, Suite 612
San Francisco, CA 94111-5520
Toll free: 800-934-2873
Voice: 415-834-9970
Fax: 415-834-9980
<http://www.braintumor.org>

Disclaimer

This booklet is an educational resource about meningiomas intended for use by nurses and other health care professionals. The text is not meant to be a substitute for medical care.

Telephone numbers and other contact information for organizations listed above may be subject to change.

Online Support and Information

Free online groups are provided by The Healing Exchange BRAIN TRUST, a charitable organization that helps people affected by brain tumors and related conditions. More than two thousand brain tumor survivors, family members and others who are interested in this topic exchange email messages, sharing support and information with each other. To learn about the BRAINTMR list, The Meningioma List, TOPS (teens of parent survivors) or other online groups, contact:

info@braintrust.org

Additional information about most of these groups is also available at this web site:

