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Web Exclusive: When Cancer Spreads to the Brain

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In addition to primary brain tumors, which originate in the brain, tumors can spread to the brain from primary tumors elsewhere in the body when cancer cells break off the main tumor and make their way through the bloodstream to the brain. When this occurs, a tumor is said to be metastatic. (Breast cancer that spreads to the brain is still breast cancer, not brain cancer.)

At least 25 percent of adults with cancer (120,000 to 140,000 cases) will have brain metastases, which are more common than primary malignant brain tumors (21,000 cases). While many types of cancer can spread to the brain, the most common are lung, skin, and breast. Lung cancer alone accounts for 50 percent of all metastatic brain tumors.

Because metastatic brain tumors are fundamentally different from primary brain tumors, they have their own set of specifics regarding where they appear, how many lesions there will be, and treatment options. For example, metastatic breast and kidney cancers usually cause single tumors, while lung, melanoma, and colon cancers tend to cause multiple tumors in the brain. In addition, research has shown that breast cancers positive for a human epidermal growth factor, or HER2, are more likely to metastasize to the brain.

Treatment options for patients with metastatic brain tumors include surgery, radiation, and chemotherapy, with the standard treatment being whole brain radiation therapy and some form of surgery, if possible. The choice of treatment and the combination depends on myriad factors such as the size, number, and location of the tumor(s); whether the primary tumor responded to treatment; and the health of the patient. In some cases patients have the option to use non-invasive radiosurgery, which delivers focused radiation directly to the tumor and reduces damage to surrounding tissue.

While surgery and whole brain radiation therapy remain the standard of care, clinical trials are under way using chemotherapy drugs that cross the brain's blood-brain barrier, with positive results specific to breast cancer leading the way.

Brenda Hutchison was diagnosed with stage 2B HER2-positive breast cancer in 2003 at age 44. She began standard treatment and remained in remission until mid-2005 when her tumor markers started to climb and a tiny tumor was found while she was having scar tissue removed from her breast reconstruction. A scan revealed a lymph node under her arm and nodes in her chest were malignant, and spots on her lungs were suspicious. She began the targeted drug Herceptin

(trastuzumab) in combination with carboplatin and Taxol (paclitaxel). She finished treatment in early 2006 with complete remission—no cancer could be seen.

She remained on Herceptin until July 2006 when scans showed new spots in her lung and cervical spine. This time her oncologist added Taxol to Herceptin. Hutchison, who lives in Austin, Texas, continued working part-time, and the combo kept the metastases at bay until scans in April 2007 showed multiple brain lesions.

While disappointing, the discovery of brain metastases did not come as a surprise to either Hutchison or her doctors since one-third of women with HER2-positive metastatic breast cancer have been shown to develop brain metastases.

When Hutchison's oncologist said the standard of care was whole brain radiation, she began preparing, but at the last minute decided instead to lobby her doctors to try the pharmaceutical approach of Tykerb (lapatinib), a targeted agent that inhibits HER2 and HER1, in combination with the chemotherapy agent Xeloda (capecitabine), prior to agreeing to whole brain radiation. Tykerb in combination with Xeloda was approved for advanced HER2-positive breast cancer in March 2007, only weeks before Hutchison's brain metastases were discovered in April.

Five weeks later scans showed no increase in the metastases. By August 2007 the tumors shrank by 40 percent, and in October, scans were clear. In December 2007, Hutchison attended the San Antonio Breast Cancer Symposium in her role as an advocate for HER2-positive women. After attending two very informative sessions about new HER2 research, she could hardly contain her excitement about other options for treating her brain metastases in the future.

Tykerb has shown some success in clinical trials for treating brain metastases in HER2-positive breast cancer, though most patients do not experience shrinkage of brain tumors with this drug. Other agents under investigation for treating brain metastases include Sutent (sunitinib), approved for treating kidney cancer and gastrointestinal stromal tumor, and Temodar (temozolomide), approved for two types of primary brain tumors (glioblastoma multiforme and anaplastic astrocytoma).

Hutchison remains in remission and embarked on a 10-day trip to Europe in late June.

For more information on metastatic cancer, read *CURE's* "A Patient's Guide to Metastatic Cancer."