Leptomeningeal Metastases

Leptomeningeal metastases (LM) occur when cancer spreads to the membranes lining the brain and spinal cord.

The leptomeninges are the membranes lining the brain and spinal cord. The cerebrospinal fluid (CSF) lies in between these membranes. Cancer in this location has many different names, including LM, neoplastic meningitis, and carcinomatous meningitis. Cancer cells may travel to the leptomeninges from other parts of the body via blood vessels or spread directly from the bones of the spine.

What Are the Symptoms of LM, and How Is It Diagnosed?

Symptoms of LM result from cancer cells clogging the normal exits for CSF causing a fluid buildup and increased pressure in the brain. This increased pressure can cause vague but uncomfortable symptoms including headaches (often worse in the morning), nausea, vision changes, and difficulty walking. Cancer cells can also disturb nerves exiting the brain causing numbness, weakness, or pain.

Suspicion of LM may arise if these symptoms develop in someone with a cancer known to spread to the nervous system, such as lung or breast cancer. In many cases, LM can be seen on magnetic resonance imaging. However, the best test for LM is to obtain a CSF sample by performing a lumbar puncture (spinal tap), which is when a needle is inserted into the back between the bones of the spine, below the level of the spinal cord. The CSF is examined for cancer cells under a microscope. Researchers are working on newer, more accurate tests looking for DNA signatures as well.

How Is LM Treated?

Unfortunately, LM remains incurable, so treatments are often symptom directed. However, for some cancers, new therapies have improved prognoses dramatically.

The treatment for LM is based on 2 guiding principles: (1) to reduce pressure on the brain caused by any CSF buildup, and (2) to reduce the number of cancer cells causing the pressure.

If the CSF pressure is elevated, it can be reduced via lumbar puncture or use of some medications. If needed, a more permanent drain, called a shunt, can be placed by a neurosurgeon.

A subset of drugs, including some of the newer oral targeted therapies, can cross the blood-brain barrier and may be used to treat LM. Other drugs may be administered directly into the CSF through a special port placed into the brain by a neurosurgeon. Radiation therapy can also be used to kill cancer cells on the leptomeninges. Irradiation can be an important part of treatment if the pressure is very high or if signs or symptoms of pain, numbness, or weakness are significant.

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