Bone Marrow Aspiration and Biopsy

This section has been reviewed and approved by the Cancer.Net Editorial Board [1], November / 2013

Key Messages:

- Bone marrow aspiration and bone marrow biopsy are short medical procedures that collect a sample of bone marrow, the spongy tissue inside of bones, so it can be examined.
- The procedures, which are often done together, are used to diagnose some cancers, provide specific information about a blood cancer, or monitor the side effects and effectiveness of chemotherapy.
- Before a bone marrow aspiration and/or biopsy, talk with your doctor about the benefits and risks of each procedure.

Bone marrow is the spongy, fatty tissue found inside larger bones. It produces red blood cells (cells that carry oxygen to all parts of the body), white blood cells (cells that help the body fight infections and diseases), and platelets (cells that help blood clot and control bleeding). Sometimes doctors need to examine the development and function of these cells. To do this, they may recommend having a medical procedure, such as a bone marrow aspiration or a bone marrow biopsy, to collect a sample of bone marrow. The results of a bone marrow aspiration and/or biopsy help doctors diagnose the following conditions:

- An infection with an unknown cause
- Blood disorders
- Chromosomal or genetic diseases
- Cancer of the blood cells, such as leukemia
- Lymphoma that has spread to the bone marrow
- Multiple myeloma

Besides being used for diagnosis, these procedures are also valuable for describing a blood cancer, identifying its subtype, and classifying or staging [2] the cancer (way of describing where the cancer is located, if or where it has spread, and whether it is affecting other parts of the body). The procedures can also be used to monitor the side effects of chemotherapy [3] and determine whether the treatment is working.

About the procedure

A bone marrow aspiration is a procedure that removes a sample of the liquid portion of bone marrow. A bone marrow biopsy removes a small, solid piece of bone marrow for examination. A common site for bone marrow aspiration and biopsy is the pelvic bone, which is located in the lower back by the hip.

Bone marrow aspiration and biopsy are often done at the same time. Together, they are referred to as a bone marrow examination. Your doctor will decide whether you need to have a bone marrow aspiration, a bone marrow biopsy, or both.

The medical team

Bone marrow aspiration and biopsy are usually performed by an oncologist (a doctor who specializes in treating cancer), a hematologist (a doctor who specializes in treating blood disorders), or a pathologist (a doctor who specializes in interpreting laboratory tests and evaluating cells, tissues, and organs to diagnose disease). Other members of the health care team, such as a nurse or physician assistant, may also be involved. After the procedure, a pathologist examines the bone marrow cells that were collected under a microscope, and the results are summarized in a pathology report [4] that will be given to your oncologist or hematologist.

Preparing for the procedure

When you schedule your procedure, you will get a detailed explanation of how to prepare. There are usually no restrictions on eating or drinking before the test, unless you will be receiving general anesthesia. However, there may be medications that you should not take before your procedure, such as blood thinners. Tell the doctor or specialist about all of the medications you currently are taking, and ask whether you should take them on the day of your procedure.

You will also be asked to review and sign a consent form that states you understand the risks and agree to have the procedure. Talk with your doctor about any concerns you have about the bone marrow aspiration or biopsy.

During the procedure

Bone marrow aspiration and biopsy procedures are usually performed in an outpatient treatment area, such as a hospital building, clinic, or a doctor?s office. When both of these procedures are done together, they usually take about 30 minutes to complete.

Because you will receive a local anesthetic (medication to block the awareness of pain), you will need to let your doctor know if you have ever had an allergic reaction to an anesthetic. A doctor may use conscious sedation (a type of anesthesia that uses pain relievers and sedatives so the patient is awake but does not feel any pain). Conscious sedation usually allows you to speak and respond during the procedure, but most people have little to no memory of the procedure afterward.

If the pelvic bone is the site of the aspiration or biopsy, you will be asked to lie on your stomach on an examination table. The skin surrounding the site will be cleansed with an antiseptic solution. A local anesthetic is then injected through the skin into the tissue next to the bone with a small needle. You will feel a slight stinging sensation before the area becomes numb.

If both a bone marrow aspiration and biopsy are needed, the bone marrow aspiration is completed first. A special, hollow needle is inserted into the numbed area and pushed gently into the bone. Once the needle is fully inserted, the center portion of the hollow needle is removed, a syringe is attached to the needle, and the liquid portion of the bone marrow is withdrawn into the syringe. You may feel a deep, dull, aching pain for a few seconds, similar to a toothache. It may help to hold a pillow tightly or squeeze another person?s hand. After the bone marrow aspirate (liquid) is collected, the needle is removed, and the pain will go away.

For the bone marrow biopsy, a larger needle is inserted into the same area and guided into the bone. The needle is rotated until an adequate sample of tissue is removed. You may feel pain and pressure as the needle moves into the bone. The entire needle is then removed, and a pressure dressing (a protective covering that places pressure on top of a wound) is placed over the site to prevent bleeding.

After the procedure

You will be able to go home shortly after the procedure. However, if you received sedation, the medical team may ask you to lie down for about 20 minutes until its effects wear off. You will also need a ride home, so bring someone with you or make arrangements for a ride before the procedure.

Once you are home, keep the area around the pressure dressing clean and dry. Ask your doctor when you can remove the dressing, and do not shower or bathe until that time. There will likely be some blood on the dressing, which is normal. You can then cover the wound with a bandage until it is fully healed. You may feel discomfort at the needle insertion site for several days, especially when bending over. Some people may also feel pain down the back of the leg. Mild bruising is normal and can occur several days after the procedure.

It is important to tell your doctor if you have any of the following problems after the procedure:

- Fever of 101 degrees Fahrenheit or higher
- Uncontrollable bleeding
- Unusual discharge or severe pain at the needle insertion site
- Any other signs or symptoms of infection

Questions to ask your doctor

Before you have a bone marrow aspiration, bone marrow biopsy, or a bone marrow examination, consider asking your doctor the following questions:

- Who will perform the procedure?
- What can I expect to happen during the procedure?
- How long will the procedure take?
- What are the risks and benefits of having the procedure?
- Will I be awake or asleep during the procedure?
- Will I feel any pain during the procedure? If so, for how long? What can be done to reduce the pain?
- How soon can I return to my normal activities after the procedure?
- Can you give me instructions on how to care for the wound?
- When will I learn the results?
- Who will explain the results to me? Will more tests be necessary if the results indicate cancer?

More Information

Tests and Procedures [5]

What is Stem Cell / Bone Marrow Transplantation? [6]

Donating Bone Marrow [7]

Additional Resources

MedlinePlus: Bone Marrow Aspiration [8]

MedlinePlus: Bone Marrow Biopsy [9]

Links:
[1] http://www.cancer.net/about-us
[2] http://www.cancer.net/node/25070
[3] http://www.cancer.net/node/24676
[4] http://www.cancer.net/node/24715
[5] http://www.cancer.net/node/24959
[6] http://www.cancer.net/node/24717
[7] http://www.cancer.net/node/24502
[8] http://www.nlm.nih.gov/medlineplus/ency/article/003658.htm
[9] http://www.nlm.nih.gov/medlineplus/ency/article/003934.htm