Bone Marrow Aspiration and Biopsy in Children

Introduction

Bone marrow is the active tissue inside our bones which is responsible for the production of blood cells, namely, red blood cells for oxygen transport, platelets for bleeding control and white blood cells for body defense and immunity. A number of conditions, like blood diseases, cancers, infections, dysfunctions of the immune system, metabolic disorders and adverse effects of drugs or irradiation can affect the normal function and characteristics of bone marrow. Bone marrow aspiration and biopsy is the procedure to obtain small amount of bone marrow from patients for examination in the laboratory to help diagnose and manage the above conditions.

Indication

Bone marrow examination is indicated in the following situations:

1. Unexplained deficiency or excess of blood cells
2. Unexplained enlargement of lymph glands, liver or spleen
3. Diagnosis and follow up assessment of leukemia
4. Staging and follow up assessment of other cancers
5. Unexplained prolonged fever
6. Suspected metabolic disorders
7. Other situations as judged and explained by your doctor

Preparing Your Child for the Procedure

1. If sedation or general anaesthesia is required, your child should not eat or drink for at least 4 hours before the procedure to avoid vomiting and aspiration.
2. Be encouraging and optimistic so as to help your child relax.
3. As appropriate to the age of your child and with the help of your doctor, try to explain to him/her in reassuring tone why and how the procedure is performed.

How the Procedure is Performed?

1. Bone marrow aspiration and biopsy is painful and patient needs to lie still during the procedure. General anaesthesia or sedation is usually required for children while sedatives plus local anaesthesia may be adequate for adolescents for relaxation and alleviation of pain.
2. The posterior iliac spine of the pelvic bone situated at the back is the usual site for performing the procedure in children. Sometimes, other sites like the anterior iliac spine of the pelvic bone, or the tibia may be chosen depending

on the size and clinical condition of the patient.

3. During the procedure, your child will either lie face down or on his/her side and the skin over the biopsy site will be cleaned and sterilized with antiseptics.
4. A needle will then be inserted through the skin into the bone through which a few milliliter of bone marrow blood is sucked into a syringe (aspiration) and a tiny piece of bone marrow tissue is taken out from the bone (biopsy).
5. The needle is then removed and the puncture site covered with sterile gauze and pressure dressing.

Care After the Procedure

1. Your child will be closely observed in the hospital for a few hours after the procedure until he/she has regained full consciousness and any bleeding from biopsy site has securely stopped.
2. Mild pain over biopsy site may last for a few days and can be controlled with simple analgesics like paracetamol.
3. Pressure dressing can be removed in 2 days' time.
4. Report to your doctor or nurse or bring your child to the Emergency Department if one or more of the following conditions occur:
   a. Increasing pain, bleeding, redness, swelling or pus discharge from the biopsy site.
   b. Your child complains of abdominal pain.
   c. Your child feels or looks unwell.

When will the Result be Available?

Provisional result will usually be ready in 1 to 2 days while the full report may take 1 to 2 weeks or even longer.

Possible Risk and Complications of the Procedure

1. Bone marrow aspiration and biopsy is considered a very safe procedure. Common adverse events are limited to mild pain and bleeding at the biopsy site which are transient and easily controlled with simple analgesic and local pressure.
2. Serious complications related to the procedure have been reported in 0.05% to 0.12% of cases as listed below:
   a. Serious bleeding from biopsy wound, into the retroperitoneum (after pelvic bone puncture) requiring wound suture, blood transfusion, surgical intervention, extended stay in hospital or intensive care.
   b. Infection of the biopsy wound with or without spreading cellulitis and

abscess formation of the retroperitoneal blood clot requiring antibiotics, surgical intervention, extended stay in hospital or intensive care.

3. Very rare complications limited only to a few case reports from the literature include retention of broken needle fragment in pelvic bone.
4. Only a few cases of procedure related death has been reported. Causes of which include uncontrolled infection of the biopsy wound
5. Serious complications related to sedation and anaesthesia are uncommon but possible. Consult your doctor for more details.

Alternatives Procedure

You can choose not to undergo the procedure. However, there may be important information that can only be obtained by bone marrow examination. Refusing the procedure may preclude accurate diagnosis and appropriate treatment of your child's illness.

Remarks

The list of complications is not exhaustive and other unforeseen complications may occasionally occur. In special patient groups, the actual risk may be different. For any queries or further information, please consult your medical staff.