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A Brief Note on Bone Marrow Aspiration

Ligongo Asa*

Department of Medicine, University of Salvador, Bahia, Brazil

About the Study

The most common site for aspiration biopsy is the ilium, particularly the posterior iliac crest. With sternal aspiration, there is a higher probability of an unfavorable occurrence. Up to the age of 18 months, aspiration from the medial surface of the tibia can give good diagnostic specimens, but it is mostly employed in infants for whom other sites are less suitable. Aspiration from the ribs and the spinous processes of the vertebrae is also conceivable, albeit it is rarely used nowadays. Sternal aspiration should begin at the level of the second intercostal space, from the initial half of the sternum's body. Aspiration from any point lower in the sternum raises the procedure's dangers.

The ilium can be aspirated from either the anterior or posterior iliac crest. A lateral route, a few millimetres below and posterior to the anterior superior iliac spine, is ideal for aspiration from the anterior iliac crest. It is also feasible to approach through the crest of the ilium with the needle pointing in the direction of the main axis of the bone, but this is more challenging due to the bone's hardness. The posterior superior iliac spine is frequently used to obtain aspirates from the posterior iliac crest. It is simpler to do aspiration and trephine biopsy from nearby sites when the two procedures are performed at the same time. The usage of the ilium is required for this. There is a choice between the sternum and the iliac crest if a trephine biopsy is not performed. Both are suitable for adults and older children, though sternal aspirations must be done with extreme caution. In a study of 100 patients who had both methods, sternal aspiration was found to be technically easier and to generate an acceptable diagnostic specimen more frequently, despite the fact that it was more painful on average, both in terms of bone penetration and the actual aspiration. Sternal aspiration is riskier at any age (see below), and it is not recommended for usage in small children. Children, infants, and many neonates can benefit from posterior iliac crest aspiration.

Tibial aspiration is appropriate for extremely young neonates, but in older children, it has no advantages over iliac crest aspiration. The aspiration of bone marrow should be done quickly; while this is more painful, it results in a higher cellular and particulate sample. Preparation of wedge-spread films and films of crushed marrow fragments; flow cytometric immunophenotyping; cytogenetic analysis; ultrastructural examination; culture for microorganisms; culture to study haemopoietic precursors; and preparation of histo-logical sections of fragments are all possible with bone marrow specimens obtained by aspiration.

Both wedge-spread films and squash preparations are recommended by the International Council for Standardization in Haematology (ICSH). Such preparations are stained with a Romanowsky stain, either a May-Griinwald-Giemsa (MGG) or a Wright-Giemsa stain, after drying and methanol fixation. Cytogenetic analysis is most commonly used to diagnose suspected haematological neoplasms, but it can also be used to diagnose suspected congenital karyotypic abnormalities such trisomy 18 in less than a day, as opposed to three days with peripheral blood lymphocytes. When bone marrow aspiration fails completely, this is known as a 'dry tap.' Although a dry tap can occur when the histology of the bone marrow is normal, it usually suggests a serious illness, such as metastatic cancer, chronic myeloid leukaemia, primary myelofibrosis, or hairy cell leukaemia with fibrosis. On other times, only blood is taken (a 'blood tap'); this is frequently the outcome of fibrosis caused by bone marrow disease.

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***Address for Correspondence:** Dr. Ligongo Asa, Department of Medicines, University of Salvador, Bahia, Brazil; E-mail: asail435@lig.in.com*

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