JL.14. Practical Guide to Bone Marrow Sampling for Suspected Myelodysplastic Syndromes

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Over 10,000 individuals are diagnosed with myelodysplastic syndromes (MDS) annually in the United States. Bone marrow (BM) examination is essential for diagnosis, classification, and risk-stratification of MDS. The World Health Organization classification is based on BM blast percentage and type and degree of dysplasia. Risk stratification using the Revised International Prognostic Scoring System requires blasts percentage, depth of cytopenias, and characterization of cytogenetic abnormalities. Proficiency in this procedure is critical to obtain high-quality BM specimens to facilitate accurate diagnoses and minimize patient discomfort and risk. The BM examination requires a BM aspirate (BMA) to evaluate cell morphology and cellular elements, including blasts, and core BM trephine biopsy (BMTB) to describe cellularity, topography, stromal elements, and the proportion and maturation of hematopoietic cells. Combined examination of the BMA and BMTB allows the most thorough morphological assessment. Assessing dysplasia can be difficult, thus specimen quality is critical. Quality depends on the instruments used as well as operator proficiency. Generally, two adjacent sites are sampled to obtain the BMA and BMTB to avoid crush artifact and poor sampling. The posterior iliac crest is the preferred site for this procedure. Patients are positioned prone or in the right/left lateral decubitus position. Following sterile site preparation, the periosteum is infiltrated with 5 to 10 mL of 1% to 2% lidocaine to minimize pain. BMA samples should be evaluated for the presence of spicules to ensure proper BM sampling. If a BMA cannot be obtained due to fibrosis or cellular packing, touch preparation of the BMTB can yield valuable cytologic information. An adequate BMTB specimen must be ≥ 1.5 cm in length to allow evaluation of ≥ 10 partially preserved intertrabecular areas. Following the procedure, firm pressure is applied to the site for 5 minutes for adequate hemostasis, followed by placement of a pressure dressing. Patients at risk of bleeding (thrombocytopenia, aspirin use, and anticoagulation) should be evaluated, and if necessary treated, prior to the procedure to reduce bleeding risk. The patient should be instructed not to bathe, swim, or soak in a Jacuzzi for at least 48 hours after the biopsy. Complications are unusual but patients should be given an emergency contact number in case of bleeding, pain, fever, erythema, or swelling at the biopsy site. The pressure dressing may be removed after 24 hours and acetaminophen may be taken for pain.