105 Chronic Myeloid Leukemia

Hagop Kantarjian, Elias Jabbour, Jorge Cortes

Chronic myeloid leukemia (CML) is a clonal hematopoietic myeloproliferative stem cell neoplasm. The disease is driven by the *BCR/ABL1* chimeric gene that codes for a constitutively active tyrosine kinase, resulting from a reciprocal balanced translocation between the long arms of chromosomes 9 and 22, t(9;22)(q34.1;q11.2), known as the Philadelphia chromosome (Ph) **(Fig. 105-1)**. Untreated, the course of CML is typically biphasic or triphasic, with an early indolent or chronic phase, followed often by an accelerated phase and a terminal blastic phase. Before the era of BCR-ABL1 tyrosine kinase inhibitors (TKIs), the median survival in CML was 3–7 years, and the 10-year survival rate was 30% or less. Introduced into standard CML therapy in 2000, TKIs have revolutionized the treatment, natural history, and prognosis of CML. Today, the estimated 10-year survival rate with imatinib mesylate, the first BCR-ABL1 TKI approved, is greater than 85% and approaches that of the general population. Allogeneic stem cell transplantation (SCT), a curative approach but one that involves more risks, is now offered as second- or third-line therapy after failure of TKIs.