

Identification of Individuals in Forensic Situations after Allo-Hematopoietic Stem Cell Transplantation

Authors : Anupuma Raina, Ajay Parkash

Abstract : In forensic investigation, DNA analysis helps in the identification of a particular individual under investigation. A set of Short Tandem Repeats loci are widely used for individualization at a molecular level in forensic testing. STRs with tetrameric repeats of DNA are highly polymorphic and widely used for forensic DNA analysis. Identification of an individual became challenging for forensic examiners after Hematopoietic Stem Cell Transplantation. HSCT is a well-accepted and life-saving treatment to treat malignant and nonmalignant diseases. It involves the administration of healthy donor stem cells to replace the patient's own unhealthy stem cells. A successful HSCT results in complete donor-derived cells in a patient's hematopoiesis and hence have the capability to change the genetic makeup of the patient. Although an individual who has undergone HSCT and then committed a crime is a very rare situation, but not impossible. Keeping such a situation in mind, various biological samples like blood, buccal swab, and hair follicle were collected and studied after a certain interval of time after HSCT. Blood was collected from both the patient and the donor before the transplant. The DNA profile of both was analyzed using a short tandem repeat kit for autosomal chromosomes. Among all exhibits studied, only hair follicles were found to be the most suitable biological exhibit, as no donor DNA profile was observed for up to 90 days of study.

Keywords : chimerism, HSCT, STRs analysis, forensic identification

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