

TREPAN AND GO: HDNA COLLECTION AND PROFILING FROM BONES IS NOT CHALLENGING ANYMORE

Hubac S, Marty J, Schubert H, Hermitte F, Hickey J, Bloomfield G
Forensic Science Laboratory of the French Gendarmerie, ZyGEM

DNA typing from degraded human remains like bones is still challenging forensic DNA scientists mainly for sampling and purification steps where protocols are complex not standardized, time consuming and source of contaminations. The objective of this study is to present a rapid, standardized and easy to use method to collect and analyze bones in less than 2.5 hours.

A fragment of femur was collected from a burned body to identify the victim. Standardized fragments of bones were removed from the femur in a plug format using an innovative trepan fixed on rotary tool. Bone material from plugs was lysed and DNA purified in 20 minutes using Zygem chemistry and PDQex2400 device. DNA amplification was performed with GlobalFiler PCR amplification kit (Thermo Fisher) on a Veriti Thermal Cycler followed by capillary electrophoresis (3500 XL). The results were compared to those obtained with the regular protocol for bones preparation using a rotary saw and a grinder. DNA was extracted from the bone's powder using PrepFiler Express BTA™ Forensic DNA extraction kit and AutoMate Express™. Full DNA profiles were obtained in both cases but only in less than 2.5 hours for Trepan and ZyGEM method compared to 6 hours for the regular protocol. This first study demonstrates the efficiency of this new method by reducing handling of samples, risk of contamination and saving a lot of time. This approach will be very helpful to be set up in a mobile lab system for provide real time victim identification with DNA typing in disaster victim situations for identify as quickly as possible degraded human remains.