IDENTIFY A CORPSE USING “UNUSUAL” ORGANIC SAMPLES: EYESWABS AND CARTILAGE

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Whenever a police officer finds an unidentified corpse or when it’s necessary exhumate an alleged father for a paternity testing, the pathology and forensic genetics activity calls for the search and sampling of "standard" corpse organic matrices for which the extensive bibliography and practical experience document a good success for DNA analysis and interpretation of the genetic profile.

In fact, during these investigations, organic samples such as nails, fragments of the ileopsoas muscle, teeth and bones, particularly femur and humerus, are usually taken. Depending on the state of degradation of the samples, it is very common to encounter difficulties and technical-analytic limitations for the extrapolation of the deceased's genetic profile due to the inevitable degradative processes to which an organic tissue is subjected after death. Such processes macroscopically decompose the dead body not only macroscopically but also microscopically, at cellular level, its DNA, which undergoes chemical and structural changes that may sometimes make the analysis extremely difficult for forensic / identifying purposes as well.

For example, the extractive phase of the forensic-genetic analysis of these matrices is usually quite long and complicated, since the samples must undergo several steps of mechanical treatments and decalcification. These processes, according to any single case, might even last many days, which extends considerably the analysis timing and delay the delivery to the court of the final results.

Moreover, to worsen the delicate steps in preparing the organic sample, the high risk of exogenous contamination to which the samples are exposed, especially the bone remains for which the risk of exogenous contamination is always very high, must always be taken into account.

At the end of all these long and hard-working lab tests, there is no certainty of the analysis success for obtaining a good and interpretable genetic profile useful for identification / parenting purposes.

Due to this limiting situation, it’s necessary research and sample other types of corpse samples that at the very least can provide a clearer and more reliable result that can be used in Court.

So, during genetic testing requested by the Court, in addition to sampling classical cadaveric tissues, it was decided to try and pick up other types of tissues from different anatomical sites, in particular the basal membrane of the eyeballs and cartilages (of the epiglottis and pubic symphysis).

In the case of eyeswabs, performing a normal sterile swab by scratching on the basal membrane still present in the ocular bulb, a portion of tissue was sampled and immediately put into lysis and extraction phases according to canonical DNA extraction procedures from tissues, without applying

mechanical / liquid nitrogen fragmentation or additional-modified protocols (as it is necessary to do in muscle or bone samples). Well, within a day and a half, you can extract an excellent genetic profile, with a very slight degrading performance, but absolutely clean, clear, interpretable and useful for subsequent phases of comparison and identification.

In the same way, by using cartilages (in the cases treated by us, the epiglottis and the cartilage of pubic symphysis), the DNA extraction process is always carried out through canonical protocols, thus allowing, in a short time, an excellent genetic profile, clear and interpretable, useful for identification.

So these kinds of “unusual” samples allow to extract single clear genetic profiles which can be decoded bypassing both the phase of mechanic treatment and the arduous phase of decalcification. This way, by using the standard procedure of DNA extraction from tissue, it is possible to obtain, in a shorter time and with maximum efficiency, an excellent genetic profile, which proves to be useful and can be easily decoded for later paternity tests and/or identification tests.