B32 Mixed Buccal Cells in a Paternity Case

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After attending this presentation, attendees will learn that tampering and manipulation of DNA reference samples can occur and establish pro- cedures to reduce such from occurring. Forensic scientists should be cognizant that

This presentation will impact the forensic community and/or humanity by demonstrating the importance of knowing that intentional contamination of reference samples, in this case saliva, could happen, and all preventive measures and protocols must be established especially when taking samples for databases.

An atypical result was obtained in a DNA analysis of a paternity case. One of the samples (from the alleged father) showed contamination. After investigation, it was concluded that the donor introduced into his mouth saliva from another person a few seconds prior to buccal cell collection by swabbing.

A paternity trio (alleged father, mother, and child) submitted to DNA analysis in a paternity dispute. Following standard operation procedure, donors where placed in separate rooms, and once properly identified, each signed the informed consent form. Before sampling, donors were asked to rinse their mouths with mineral water. Then, buccal swabs were taken by trained personnel and the cellular material was transferred onto FTA® paper (Whatman, Florham Park, NJ). The samples subsequently were sent to the laboratory, and DNA analysis was performed using autosomal STR loci (Identifiler®, Applied Biosystems, Foster City, CA).

The electropherogram (ABI-310 Applied Biosystems, Foster Cit, CA) from the alleged father (AF) showed extra peaks at most of the loci, strongly suggesting a mixed sample that could be the result of tampering, laboratory contamination, or some biological phenomenon. There was a predominant profile in the mixture, possibly originating from one person, but because of the presence of a clear second profile, any possible interpretation and further conclusions were not carried out.

Mother and child profiles displayed as single sources and were consistent with a biological relationship. All procedures and positive and negative controls used during the amplification of the AF sample were double checked, and no mistakes were found. DNA extraction, quanti- tation and amplification were repeated by another technician, and identical results were obtained.

Since the swabs and the FTA® paper were clean and other support media from the same lots showed no problems, it was then suspected that the sample was somehow contaminate. One plausible explanation because nothing unusual was observed during collection, was that the donor intro- duced into his mouth some biological product (most likely saliva from another person) in the short time that elapsed between rinsing his mouth with water in a small bathroom and the sampling of the buccal cells. The AF was called back to the laboratory and it was explained to him that a very atypical result was obtained found and that another sampling was needed. After that explanation, he agreed to provide more buccal cells. However, he unexpectedly admitted that he had introduced into his mouth a small plastic bag with saliva from another person (his wife) in an attempt to create a false conclusion from the DNA analysis. He wanted to be excluded as the biological father of the child (from an extramarital affair). Results showed extra alleles (intentional contamination) in the AF row. The predominant profile in the mixed sample was the same as that of the AF. The other profile could not be confirmed at that of his wife (as he claimed); she was not involved in the case and no sample could be obtained from her. The results did not exclude the AF as the biological father (PI = 157415). While this is a very atypical case, the DNA lab managers and the personnel collecting samples should be aware that it is possible to mix bio- logical fluids in the mouth attempting to thwart the DNA analysis or to delay results. Mechanisms to prevent such tampering should be considered when collecting samples, especially for felon databases. Although inten- tional contamination resulting in a mix of biological fluids in a reference sample should never cause an error (as some might suggest), unusual situations such as this one should be considered when atypical results are obtained.

STRs, Paternity, Intentional Contamination

 ** Presenting Author*