

Exclusion of an individual charged with rape by allele-specific DNA profiling on fetal tissues

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CASE HISTORY

A mentally handicapped young woman was raped by an unknown individual, who repeatedly abused of her. The crime was discovered only after she fell pregnant and aborted. By gestational age (16-18 weeks), the fetus was assumed to have been conceived when the woman was hospitalized. Hencefrom, a nurse was suspected to be her rapist, and was prosecuted. During the trial, our laboratory was asked to perform DNA profiles over some fetal tissues, the woman and the suspect. Following the analysis detailed here, evidence was given that the alleged rapist could not be the father. This case allowed us to evaluate the relative amount of genomic DNA to be extracted from different fetal tissues.

DNA EXTRACTION

Triplicate specimens from different fetal tissues (thymus, lung, spleen, heart muscle, psoas muscle, kidney, chorionic villi) were made available to us. Twenty-five mg each were submitted to a standard SDS/DTT/Proteinase K lysis, with following standard phenol - chloroform treatment (Gill et al, 1985). Dosage of resuspended DNA samples was performed by spectrophotometry, fluorimetry and yield gel evaluation, to maximize informations on the quantity/quality of DNA harvests. Average quantitative results we obtained are shown in Table 1.

Table 1. Harvest of high molecular weight DNA from different fetal tissues (25 mg each)

<u>Tissue</u>	<u>ug</u>	<u>MW</u>	<u>Tissue</u>	<u>ug</u>	<u>MW</u>
thymus	3.3	high	psoas m.	10.5	high
lung	4.0	high	kidney	2.9	high
spleen	6.3	high	ch. villi	2.5	high
heart muscle	9.0	high			

Hinf I digests from the fetus/victim/alleged rapist DNAs were processed by a standard Southern blot analysis, according to

Maniatis et al (1982). The nylon filter blot was hybridized to YNH24 probe (Nakamura et al, 1987), and to a lambda MS1/MS31 probe mix (Wong et al, 1986), under stringent conditions. Both experiments of hybridizations provided unambiguous patterns of bands. No band sharing was observed between the suspect and the fetus.

This case showed us that numerous fetal tissues can be used for extraction of high amounts of high MW genomic DNA. Largest harvests are however to be expected from compact tissues, such as muscular tissues.

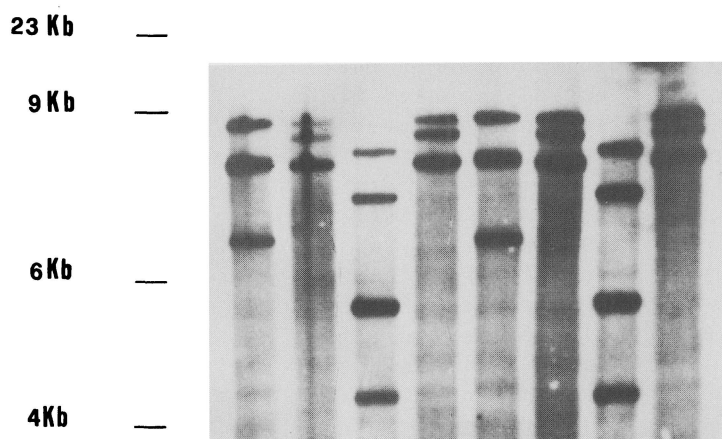


Fig.1. Allele specific profile pertaining to MS1/MS31 probe mix. From left: mother; fetal thymus; suspect; fetal spleen; mother; fetal lung; suspect; fetal heart muscle.

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