

Casuistic: The Use of DNA-Fingerprinting in Cases of Affiliation Without Mother

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INTRODUCTION

We report a case of affiliation which can be assigned to the problem area of the so called deficiency cases. The mother and the putative father both were dead. For the examinations the putative father was exhumed after a period of four weeks. The mother had died years earlier, exhumation seemed to be pointless. The following samples were taken from the putative father's corpse: heart blood, muscle, brain and bone marrow. The conventional serological typing resulted in an isolated exclusion (ACp system). The use of the hypervariable minisatellite probe MZ 1.3. gave no satisfying result (bandsharing: about 30 %). Only the use of single locus probes confirmed the exclusion from paternity.

CASUISTIC

A fortyeight-year-old man wanted to be accepted as illegitimate son of a ninetyone-year-old man, who had died two weeks ago. The natural mother was already passed away since five years. The civil division was interested about the chance that serological examinations would produce conclusive results in this paternity case. We proposed to exhume the corpse as soon as possible which was carried out four weeks after death. In spite of winter time the corpse had attained an advanced status of putrefaction. Samples could be taken from heart blood, muscle, brain and bone marrow.

EXAMINATIONS & RESULTS

From the very beginning we pursued a two-line examination: typing of the conventional markers and DNA fingerprinting. The conventional markers found are shown in table 1. Only 15 markers could be determined in the corpse's blood. The remaining 11 markers (in laboratory routine use) were destroyed by putrefaction. In the HP*system the results were inconsistent with paternity: child HP*1 and putative father HP*2. Because of the known inconstancy against putrefaction we did not excluded a destroyed HP*1 band in the post mortem blood. The second obvious exclusion was found in the acP*system: child acP*B and putative father acP*A. To our opinion one can always expect a disappearing *A pattern before destruction of the *B pattern. Nevertheless this exclusion had to be appreciated properly, especially because of the possible existence of a silent allele. In spite of the putrefaction non-degraded DNA could be isolated from heart blood and muscle tissue. The use of the multi locus probe Digoxigenin MZ 1.3

TAB. 1 CONVENTIONAL SEROLOGICAL MARKERS

Child:

O, MNss, CcD.e, K-, HP*1, GC*1s, Gm ^{-1,-2,3,10,-21}, Km ^{-1,3}, acP*B, PGM₁*a₁, AK*1, ADA*1, EsD*1, 6-PGD*A, GLO*2, PGP*2-1

Putative father:

A1, MNss, c.Ee, K-, Hp*2, Gm ^{-1,-2,3,10,-21}, Km ^{-1,3}, acP*A, PGM₁*a_{3a1}, AK*1, ADA*1, EsD*1, 6-PGD*A, GLO*2-1, PGP*3-1

TAB.2 DNA-FINGERPRINTING : a) p YNH 24; b) pL336				
Enzyme	Child		Putative Father	
a)				
Pst	10.900	+/- 0.33 Kb	12.750	+/- 0.38 Kb
	10.250	+/- 0.31 Kb	11.500	+/- 0.35 Kb
HINF I	2.825	+/- 0.08 Kb	4.650	+/- 0.14 Kb
	2.250	+/- 0.07 Kb	3.100	+/- 0.09 Kb
Hae III	1.700	+/- 0.05 Kb	3.750	+/- 0.11 Kb
	1.225	+/- 0.04 Kb	2.075	+/- 0.06 Kb
b)				
Pst	3.24 Kb		6.76 Kb	
	3.09 Kb		4.65 Kb	

(BIOTEST, Germany) led to the electrophoretical results shown in figure 1. The evaluation gave no definite conclusion: the band sharing rates were 36%, 43,9% and 35,5%.

Only the use of single locus probes [pYNH 24 (PROMEGA), pL 336, (COLLABORATED RESEARCH INCORPORATED)] led to reproducible and definite results. These results are shown in figure 2 and described in table 2. The dead putative father could unambiguously excluded from paternity.



FIG. 1 MZ 1.3 DIGOXIGENIN : Lane 1 - genomic DNA control; Lane 2,16 - bacteriophage DNA HIND III; Lane 3,9,13 - Child; Lane 4,10,14 - P.f. heart blood; Lane 5,11,15 - P.f. muscle tissue; Lane 6 - P.f. bone marrow, degraded; Lane 7 - P.f. brain cortex, degraded; Lane 8,12 - bacteriophage Bst EII

CONCLUSIONS

In this reported case experiences show that DNA examinations principally should be included in so called deficiency cases. To the conventional serological examinations DNA fingerprinting is an important supplement. 10 years ago this paternity case would not have been solved definitely. Additionally the reported case shows that multi locus probes and single locus probes should be used parallel to achieve an expanded spectrum of examinations.

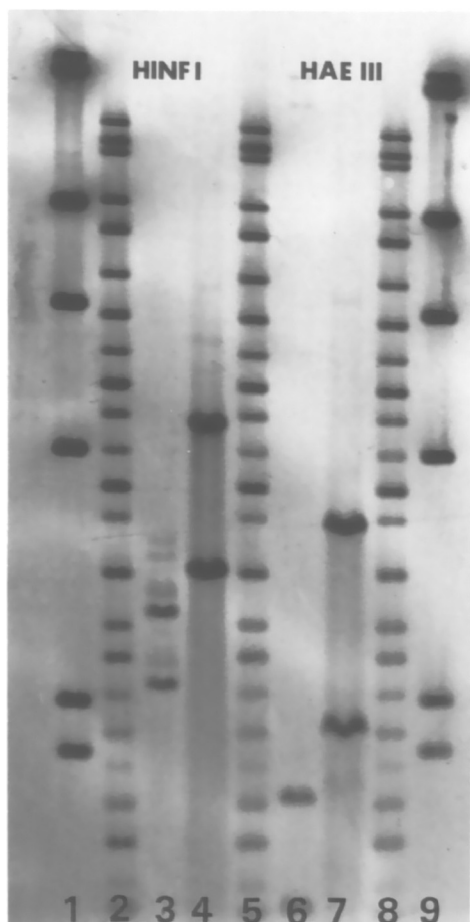


FIG. 2 : Use of pYNH 24

Lane 1,9 - bacteriophage DNA
HIND III marker
Lane 2,5,8 - analytical marker
DNA Wide Range #DG 1931
(PROMEGA)
Lane 3,6 - Child
Lane 4,7 - Putative Father,
muscle tissue

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