CASE REPORT OF A DISPUTED PATERNITY WITH NO BIOLOGICAL SAMPLE FROM THE PUTATIVE FATHER

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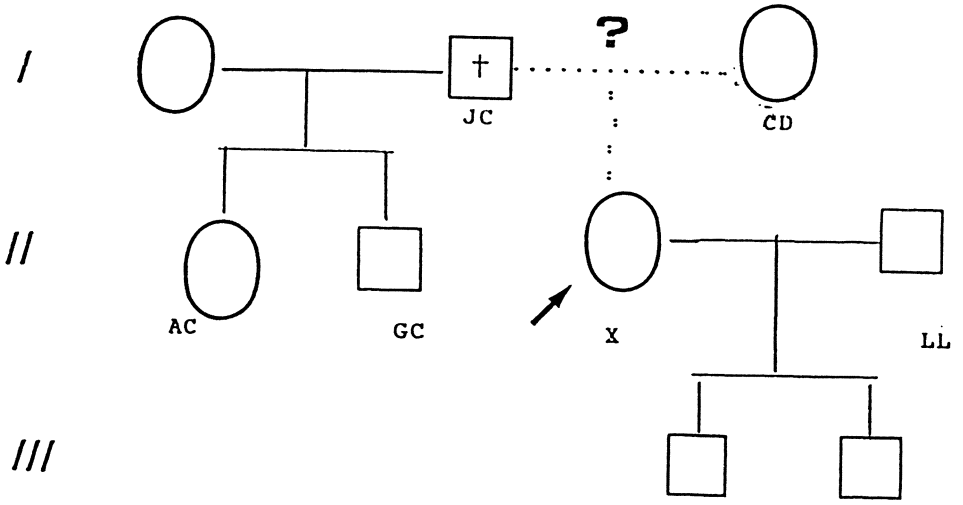
We received in the Paternity Testing Section (University Complutense Madrid) several blood samples in order to solve a parentage problem of some complexity (deceased father with no possibility of obtaining any biological sample from his remains). The problem is shown schematically in Fig 1.



In order to solve the disputed paternity problem we were able to get samples from GC and AC, son and daughter of JC (dead) and presumably X's step-brother and step-sister (sharing father). We found another difficulty, the lack of cooperation from M, biological mother of GC and AC. Therefore we had some trouble in finding the genetic markers received from their father. On the other hand, we could count on blood samples from CD, biological mother of X and also from X's husband and children.

We used 8 blood groups, 5 protein polimorphysms, 2 red-cell enzymes, HLA system (A, B, C) and 6 DNA genetic markers (YNH24, TBQ7, MS31, MS43a, D1S80 and ACTBP2).

We used the markers´ frequencies found elsewhere for caucasic population for probability estimation.

RESULTS

1. The results obtained for blood groups, enzymes and proteins did not discard consanguinity but they had no statistical significance. Nevertheless, the results found for HLA and DNA showed a clear sibling relationship between AC-GC and X.

2. Studying the 6 DNA loci mentioned above, we obtained a paternity index (PI) of 419,93 and a consanguinity probability (father-sharing) of 99,7625. There was no incompatibility in any locus. When no coincidence was found, we asigned a value of x=0,25 (PI=x/y). When there was allele sharing, the value for x was 0,25 and for y was the shared allele population frequency.

3. HLA showed the following results:

- GC = A2A29 B18B50 Cw1Cw5
- AC = A29A30 B8B57 Cw6Cw7
- X = A2A29 B18B44 Cw1 C--

In order to find out X´s paternal haplotype we analyzed X´s mother, husband and children (who showed identical HLA phenotype):

- Mother = A2A29 B44B52 C--C--
- Husband = A1A-- B8B38 Cw6C--
- Children = A1A29 B8B44 C--C--

Thus we deduced the paternal haplotype in X: A2B18Cw1 which frequency in Spanish population is 0,0002939. GC's phenotype implies this same haplotype (A2B18Cw1) with a segregation probability of 21,377% and so we obtained a PI=0,21/0,0002939=733,62.

CONCLUSIONS

1. The father-sharing probability of X with GC and AC studying DNA markers was 99,7625%.

2. HLA revealed no haplotype shared between GC and AC (this happens in a 25% of cases between siblings) while GC and X shared the highly infrequent HLA haplotype A2B18Cw1. Thus the father sharing probability between GC and X became 99,8638%.

3. From the results for HLA and DNA we came to the conclusion of the existence of father-sharing consanguinity between GC-AC and X with a probability of 99, 99968%, "beyond a reasonable doubt".

Acknowledgments

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REFERENCES

- CASTRO J. La Investigación de la Paternidad. Madrid. Ed, Colex, 1992.
- ERLICH HA. PCR Technology. Principles and Applications for DNA Amplification. Londres, MacMillan Publishers Ltd., 1989.
- FARLEY MA HARRINGTON JJ. Forensic DNA Technology. Michigan, Lewis Publishers Inc., 1991.
- HUGUET E, CARRACEDO A, GENE M. Introducción a la Investigación Biológica de la Paternidad. Barcelona, PPU, 1988.