

## CASE REPORT

Hui-Ling Lu,<sup>1</sup> M.S.; Chuan-Xi Wang,<sup>1</sup> M.S.; Feng-Qiang Wu,<sup>1</sup> M.S.;  
and Jian-Jin Li,<sup>1</sup> M.S.

# Paternity Identification in Twins with Different Fathers

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**ABSTRACT:** If a female has sexual intercourse with two males at short intervals within the same ovulatory period, superfecundation may occur. This article reports two cases of paternity identification in twins. The results showed that each twin had come from a different father. Thus, great attention should be paid to such a situation when the twin paternity identification is asked for.

**KEYWORDS:** pathology and biology, paternity identification, twins, superfecundation

A total of 360 cases of paternity identification have been performed by our department since 1984, including three cases of twins, two of which were found to be these twins with two different fathers. The results are reported as follows.

Ten kinds of blood typings were used in our assay. And the total exclusion probability was 0.9775. Blood typing in ABO, MN and P systems were done by hemoagglutination test in slides, and Rh typing by papain-treated erythrocytes. The EsD and GLO1 typings were performed, using starch or agarose plate electrophoresis. And the Hp, Gc typings were obtained by polyacrylamide gel disc electrophoresis. For the detection of HLA-A, B antigens, microlymphocytotoxic test was used. The paternity probability was worked out according to Essen-Moller theory.

### Case 1

A wife gave birth to a set of twins—a boy and a girl. The husband later found his wife was also having intercourse with another man. Doubting that the twins were his own, he appointed us to perform paternity identification, for the boy first. Our result showed that the possibility of paternity could be excluded. After we told him that twins might come

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<sup>1</sup>Lecturer, Department of Forensic Medicine, Sun Yat-sen University of Medical Sciences, Guangzhou, China.

TABLE 1—Results of blood typing.

	ABO	MN	Rh	P	HP	Gc	EsD	GLOI	HLA-A	HLA-B
Man	B	MN	CcDee	2	1	2-1	1	2-1	2, 33,	17, 46
Mother	A	N	CCDee	2	2-1	1	2-1	2	9, 10,	13, —
Boy	A	N	CcDEe	2	2	1	1	2	9, —,	13, —
Girl	B	N	CCDee	2	1	1	1	2	2, 10,	46, —

from two different fathers in a certain circumstance, he asked us to determine the paternity of the girl. The result revealed that the existence of paternity could not be excluded (Table 1).

As shown in Table 1, blood typings in both the man and the baby boy revealed contradiction with genetic laws in Rh, Hp systems and HLA- A, B antigens. If the man were really the boy's father, he would carry the genes RhE, Hp2 (not consider the existence of HpO gene) HLA- A- or/and A9 as well as B13 or/and B-.

The blood groups of the baby girl, on the other hand, appeared to conform genetically with those of the husband. The paternity index between them was 129.47 and the probability of paternity 99.23%. Judged by the international standards, the man could be considered as the girl's biological father.

**Case 2**

A court in Kwangchow entrusted us with the paternity identification for a pair of twins born out of wedlock. A married man secretly lived with another woman, whom he had met in a hotel. As a result, they had a pair of twins of different sexes. Later the woman accused him of refusing to provide money for child support. Results of blood typing did not show any contradiction with genetic laws between this man and the boy (Table 2). In addition, the paternity index was found to be 99.28 and the probability of paternity 98.98% confirming further the existence of paternity relationship.

The pattern of blood groups in the girl, on the other hand, showed evidence against the genetic laws when compared with that in the man who carried neither HLA-A10 nor B16. It could be concluded, therefore, that the girl was not his biological daughter.

Twins can be divided into monozygotic and dizygotic according to their embryonic genesis. Originating from a single zygote, monozygotic twins are of the same sex and the genes they carry are completely the same. The zygote then divides and develops later into two normal individuals. Dizygotic twins, in the contrast, arise from two separate ova that have been fertilized at the same or nearly the same time, so their genetic relationship is just like that between siblings. Each of such a twin always bear distinct chorionic and amniotic membranes but may sometimes share a common placenta. The cases we described belong to dizygotic twins. Each of them came from a different egg fertilized, respectively, by the sperm of two different men. This may occur when a female has had sexual intercourse with two different males at short intervals within the same ovulatory period. In Case 1,

TABLE 2—Results of blood typing.

	ABO	MN	Rh	P	HP	Gc	EsD	GLOI	HLA-A	HLA-B
Man	B	M	CcDEe	2	2-1	2-1	2-1	2-1	2, —	40, 35
Mother	O	MN	CcDee	2	2-1	2-1	2-1	2-1	2, 11	46, 40
Boy	B	M	ccDEe	2	1	2-1	2-1	2-1	2, 11,	40, —
Girl	O	MN	CCDee	2	2-1	2-1	2-1	2-1	11, 10	40,16

the female had sexual intercourse with two different men within a three-day period and in Case 2, within a nine day period. Articles on twins with two different fathers have been reported [1-4]. The results of our report suggest that attention should be paid to the possibility of those dizygotic twins with different fathers when paternity identification is requested.

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Address requests for reprints or additional information to  
Hui-Ling Lu  
Dept. of Forensic Medicine  
Sun Yat-sen University of Medical Sciences  
Guangzhou 510089  
China