

DETERMINATION OF PATERNITY OF A HYDATIDIFORM MOLE

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A hydatidiform mole (mole) is a placental tumor that occurs in an abnormal pregnancy. A mole develops from a non-viable fertilized egg and presents as a tumor of the placenta. A mole can form when an egg is fertilized by one sperm that duplicates its chromosomes in a zygote or when an egg is fertilized by two sperm cells (dispermy). Moles can be classified as complete (not associated with an embryo) or partial (an embryo is present). Complete moles carry two sets of paternal chromosomes no maternal chromosomes and their cells are diploid. Partial moles carry two sets of paternal chromosome, a complete set of maternal chromosomes and are triploid.

Both complete and partial moles carry two sets of paternal chromosomes. If the two homologous paternal chromosomes arose by duplication, their DNA sequences are identical (homozygous). If the two homologous paternal chromosomes arose from dispermy, some DNA sequences differ (are heterozygous). Since every mole carries paternal DNA, paternity can be determined.

Data from DNA STR analysis of products of conception from both a complete homozygous mole and a heterozygous mole were received independently from separate crime laboratories. We were asked to determine whether two alleged fathers were the biological father of each mole. We present formulae that can be used to determine paternity for any class of mole.