Monozygotic Equine Twins After Embryo Transfer Verified by DNA Typing

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1. Introduction
Previously, twin pregnancy, assumed to be monozygotic (derived from fertilization of one egg by one sperm), has been reported after embryo transfer, but genetic analysis was not performed. This report details a monozygotic twin pregnancy after transfer of a single embryo that is confirmed by DNA typing of microsatellites.

2. Materials and Methods
A 9-yr-old Thoroughbred mare that had received one embryo by embryo transfer 10.5 mo earlier gave birth to stillborn twin foals (both bay fillies). On visual inspection, the foals appeared to be monochorionic diamniotic. Tissue from both foals, from the recipient mare and from the donor mare, was submitted for microsatellite analysis.

3. Results
Analysis of 13 microsatellites for allele size verified that the foals had identical genotypes (were monozygotic twins) and resulted from a transferred embryo. Parentage testing showed that the embryo donor qualified as a possible dam and that the foals could not have resulted from conception of an ovum from the recipient mare.

4. Discussion
To our knowledge, this is the first report of monozygotic twin pregnancy after embryo transfer verified by genetic analysis. The organization of the fetal membranes in cases of monozygotic multiple pregnancy depends on the stage at which division of the embryo occurs. Diamniotic monochorionic twins may develop through formation of two separate blastocoeles within the overlying trophoblast, each with its own inner cell mass, or through formation of two inner cell masses bordering a single blastocoele.