Topic: Preimplantation Genetic Diagonsis

Title: A CASE REPORT: PGD (PREIMPLANTATION GENETIC DIAGNOSIS) AND PGS (PREIMPLANTATION GENETIC SCREENING) FOR OSTEOGENESIS IMPERFECTA AND DIAGNOSTIC CONFIRMATION OF NON-TRANSFERRED BLASTOCYSTS

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Introduction: Osteogenesis imperfecta type I (OI type I) is an autosomal dominant disease characterized by increased bone fragility, low bone mass and susceptibility to bone fractures. Mutations in *COL1A1* gene result in OI type I. Here we report on the PGD procedure for a couple where the male partner is affected with OI and wheelchair-bound since childhood. He and his mother carry a frameshift mutation in *COL1A1*. We set to establish a PGD assay for the couple and wanted to assess the reliability of the assay by reanalysing the non-transferred embryos.

Methods: Blood samples from the couple and the parents of the affected partner were obtained and eight STR markers closely linked with the *COL1A1* gene were genotyped to establish the phase. In addition, the mutation in *COL1A1* was detected with sequencing. Multiplex-PCR protocol of six informative STR markers was established utilizing MDA-amplified DNA from buccal cells of the male partner mimicking the analysis of trophectoderm cells. After IVF and ICSI, 10 day5 blastocysts were biopsied and analysed by the established methodology. The non-affected blastocysts were screened for aneuploidies using the 24sure platform (Illumina).

Results: The analysis revealed an affected genotype in four biopsies and a non-affected genotype in five biopsies. Three of the unaffected blastocysts showed an euploid constellation. The first transfer of an unaffected euploid blastocyst didn't result in a pregnancy. After a successful second transfer a healthy baby was born. The couple resigned prenatal diagnosis. To evaluate the reliability of the assay, non-transferred blastocysts were rebiopsied and analysed. Results were consistent with the original analysis.

Conclusions: We established a PGD assay compatible with the ESHRE guidelines for a couple with Osteogenesis Imperfecta. The analysis and the embryo transfer were successful and a healthy child ensued. Reanalysis of non-transferred blastocysts confirmed the high reliability of the PGD assay.