Case report: NF1 detection in a combined PGS/PGD cycle

Context: Neurofibromatosis type 1 (NF1) is an autosomal inherited disorder characterized by the developmental of fibromatous skin tumours, café-au-lait spots, benign neurofibromas, and Lisch nodules in the iris. This syndrome is caused by mutations in NF1 gene located at 17q11.2. Objective: Our goal was to identify the mutation c.647T>C by analyzing biopsied trophectoderm cells in order to confirm which mutation-free embryos were ready-to-transfer avoiding the allele-drop-out. Methods: The presence of mutation was confirmed in a genetic analysis by Sanger and NGS technologies on WGA material extracted from trophectoderm cells, and the subsequent blood analysis of some STRs markers present in the parents. Patients: A 32 and 36-year-old couple performed an IVF cycle with PGS/PGD. The male was diagnosed, due to neurological symptoms, as a carrier of NF1. Blood samples were required to identify benign polymorphisms in both members. The mutation c.647T>C was detected in the male blood as a confirmation of NF1. Interventions: The oocytes were inseminated using intracytoplasmic sperm injection following an in vitro procedure. Resulting embryos were cultured until day 5 and trophectoderm biopsy was carried out on twenty blastocysts. Main Outcome Measure: A high success rate in PGD for NF1 was achieved, which enabled an efficient transfer and subsequent implantation. Results: Seven of twelve embryos resulted euploid. Four were genetic carriers of the mutation and one suffered an allele-drop-out effect. Patient performed two cryotransfer cycles with SET prior to one non-transfer cycle in which endometrial scratching was carried out. Finally, a successful implantation and pregnancy were obtained. Conclusions: Results obtained by each technique were consistent about PGD/PGS for NF1. NGS and STRs analysis allowed us to confirm the inheritance of the paternal mutation.