Increased Elasticity of the Zona Pellucida Affects Micromanipulation Procedures for Preimplantation Genetic Screening at the Cleavage Stage: Possible Role of Blastomere Alterations on Inconclusive or "No Results" Interpretations

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Objective: Occasionally, submission of blastomere(s) or trophectoderm cells for preimplantation genetic screening (PGS) may be interpreted as inconclusive ("no results"). The main reasons for those results include failure of DNA amplification, degraded DNA, or failure to load cell(s) into the biopsy tube. In a particular case at our clinic, blastomere biopsies were submitted for PGS and all embryos were labeled as "no results". Interestingly, the zona pellucida (ZP) of all embryos was extremely elastic and blastomere displacement was difficult. We theorize that the high elasticity and extended micromanipulation procedures may have affected the DNA in such a way as to interfere with the accurate assessment/interpretation of results.

Design: Case Report.

Materials and Methods: A total of 43 oocytes were harvested at retrieval. Oocytes were inseminated via standard IVF or ICSI. Ten cleavage stage embryos with a minimum of 6 blastomeres were selected for biopsy/PGS screening. Assisted hatching (AH) via partial zona dissection (PZD; tridimensional) was performed prior to blastomere biopsy. Embryo biopsy was performed via blastomere displacement.

Results: The ZP of all biopsied embryos was highly elastic. In addition, the inner layer of the ZP appeared to be detached in certain areas for some embryos. Those embryos acquired an oval-elliptical shape. The lack of rigidity prevented generation of internal pressure inside the embryo, which is necessary to displace the blastomere(s). The ZP of each embryo had to be probed at different angles in order to displace the selected blastomere(s). The time required to harvest blastomeres was extended to approximately $\geq$5 min per embryo. Selected blastomeres were eventually isolated without evidence of damage to the remaining blastomeres. All embryos were labeled as "no results" after assessment by the genetic laboratory. The report and additional options were discussed with the patients, and it was decided to proceed with embryo transfer (D5) based on blastocyst morphology. Two high quality blastocysts were transferred, resulting in a singleton term pregnancy. The remaining viable embryos were considered for vitrification.

Conclusions: Zona pellucida elasticity and extended manipulation of embryos/blastomeres may result in a form DNA degradation that interferes with the accuracy or interpretation of results during genetic assessment. Further analysis of similar cases may shed light into the relationship between difficult biopsies and inconclusive PGS results.

Disclosures: Nothing to disclose.