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**ANALYZING OUTCOMES FROM MOSAIC EMBRYO TRANSFERS IN A SINGLE ACADEMIC PRACTICE**

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**OBJECTIVE:**

Transfer of mosaic embryos has been demonstrated to result in healthy live births. Acceptance for mosaic embryo transfer has grown among many reproductive clinics, yet additional data is needed to establish mosaic embryo transfer as standard of care. This study aims to assess embryo characteristics, prenatal genetic testing, and pregnancy outcomes following transfer of embryos reported as mosaic at a single academic center.

**MATERIALS AND METHODS:**

The study included all patients who had mosaic results after preimplantation genetic testing for aneuploidy using Next Generation Sequencing and planned a single, frozen-thawed mosaic embryo transfer from July 2020-March 2022. Embryo grade, day of biopsy, prenatal genetic testing, and transfer outcomes were assessed. Types of chromosomal anomalies and low vs. high mosaicism were compared among transfers resulting in ongoing pregnancy/live birth (OP/LB) vs. implantation failure or loss (IF/SAB) using chi square and Fischer's exact tests.

**RESULTS:**

A total of 28 patients with a planned single, frozen-thawed mosaic embryo transfer were identified. One embryo did not survive thaw, and a total of 27 transfers were performed. Pregnancy occurred in 15 patients (56%), and 10 transfers resulted in OP/LB (37%). 5 pregnancies ended in spontaneous abortion (SAB) (33%). 4 of 8 eligible patients underwent diagnostic prenatal genetic testing via amniocentesis, all with normal results. Microarray was performed in one 11 week SAB and was normal; the other pregnancy losses could not be tested. All 5 live births resulted in healthy neonates. Trends were observed in embryo quality, day of biopsy, and types of chromosomal anomalies when comparing embryos resulting in OP/LB to those resulting in IF/SAB. A higher proportion of high quality embryos ( $\geq 4BB$ ) was seen



among OP/LB compared to IF/SAB (80% vs.59%,  $p=.41$ ), and higher proportions of Day 5 embryos vs. Day 7 embryos resulted in OP/LB(OP/LB: 60% Day 5 vs. 10% Day 7; IF/SAB: 24% Day 5 vs. 18% Day 7,  $p=.17$ ). Compared to transfers resulting in IF/SAB, successful transfers involved a higher proportion of single segmental anomalies and a lower proportion of single whole chromosome anomalies (OP/LB: 40% segmental vs. 20% whole; IF/SAB: 23% segmental vs. 65% whole,  $p=.15$ ). Similar proportions of low vs. high mosaicism (OP/LB: 80% low vs. IF/SAB: 76% low,  $p=.99$ ) were seen..

### **CONCLUSIONS:**

This study demonstrates that mosaic embryos can have high implantation potential according to embryo grading systems established for euploid embryos. Only 25% of Day 7 embryos resulted in OP/LB, indicating that, similar to euploid embryos, mosaic day 7s may have lower success rates but can still be worth transferring. Our findings suggest that embryos reported as mosaic which result in OP/LB are likely to have normal prenatal genetic testing.

### **IMPACT STATEMENT:**

It is imperative that the modern fertility center contribute to collaborative efforts required for accurate data modeling. Detailed analysis of embryo composition, prenatal testing, and pregnancy results enables evidence-based support to increase clinical adoption of mosaic embryo transfer in routine care.

### **REFERENCES:**

N/A