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DELAYING TROPHECTODERM BIOPSY DOES NOT COMPROMISE THE REPRODUCTIVE POTENTIAL OF HIGH-QUALITY EMBRYOS

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Title:

DELAYING TROPHECTODERM BIOPSY DOES NOT COMPROMISE THE REPRODUCTIVE POTENTIAL OF HIGH-QUALITY EMBRYOS

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Preferred Presentation Type:

Oral or Poster

Study Type:

Retrospective Cohort Study (includes comparator groups)

Category - Subcategory(ies):

ART: Laboratory

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Nothing to disclose. No off-label or otherwise non-approved product use.

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Abstract Category:

All Other Categories

Applied for the In-Training Award for Research

Abstract Text:

OBJECTIVE: Embryo biopsy for pre-implantation genetic testing (PGT) is performed at the fully expanded blastocyst stage of development, when the embryo is hatching from the zona pellucida and has acceptable trophoctoderm (TE) and inner cell mass (ICM) grades. When embryos undergo laser-assisted hatching on day 3, the TE may not yet be hatching by day 5. In such cases, embryos are cultured to day 6 to ensure safe access to the TE cells. This study evaluates pregnancy outcomes following single euploid embryo transfer (SEET) for embryos biopsied on day 5 compared to those cultured to day 6 due to inaccessible TE cells.

MATERIALS AND METHODS: This retrospective cohort study performed at a single academic institution included patients who underwent their first SEET cycle between January 2016 - February 2025. Only embryos from SEET cycles with a modified Gardner grade $\geq 4BB$ on day 5 were included. Patients were grouped by day of embryo biopsy: Group 1: day 5 biopsy, Group 2: day 6 biopsy (due to inaccessible TE on day 5). The primary outcome was ongoing pregnancy/live birth (OP/LB). Secondary outcomes included pregnancy, clinical pregnancy, and clinical pregnancy loss. Descriptive and univariate analyses were performed using Wilcoxon-Ranks Sum and chi-square. Logistic regression was performed adjusting for patient age at SEET, oocyte age, BMI, endometrial thickness, year of cryopreservation, year of SEET, and embryo quality at biopsy.

RESULTS: A total of 4,232 embryos with a grade $\geq 4BB$ on day 5 were included. Group 1 (day 5 biopsy) included 4091 embryos and Group 2 (day 6 biopsy) included 141 embryos. Mean oocyte age was 35.5 years in Group 1 and 35.7 years in Group 2 ($p = 0.34$). A significant difference was observed in the extent of expansion between groups, with 35.5% of embryos being fully hatched in Group 2, compared to 2.9% in Group 1 ($p = <.001$). A total of 9.9% ($n=14$) of embryos in Group 2 experienced a downgrade in TE or ICM score from day 5 ($\geq 4BB$) to day 6. Only 2.8% ($n=4$) received a grade of "C" for TE or ICM on day 6. On univariate analysis, OP/LB rate did not differ between groups (62.0% in Group 1 vs. 58.2% in Group 2, $p = 0.3529$). Adjusted analysis showed no significant difference in the odds of achieving OP/LB in Group 2 when compared to Group 1 (OR 0.80, CI 0.55-1.17, $p=0.25$). Similar results were observed in pregnancy (OR 0.821, 95% CI 0.522-1.293), clinical pregnancy (OR 0.5585, 95% CI 0.597-1.322), and clinical pregnancy loss (OR 1.377, 9% CI 0.757-2.503).

CONCLUSIONS: Delaying until day 6 to biopsy embryos that were high-quality on day 5 ($\geq 4BB$), but had inaccessible TE cells did not result in compromised SEET outcomes. Pregnancy, clinical pregnancy, clinical pregnancy loss, and ongoing pregnancy/live birth rates were comparable between high-quality day 5 embryos, whether biopsied on day 5 or following delayed biopsy on day 6.

IMPACT STATEMENT: Embryos with a modified Gardner grade $\geq 4BB$ on day 5 can be biopsied on day 5 or day 6 and result in similar ongoing pregnancy/live birth rates after SEET. This finding highlights that ideal laboratory conditions allow for safe prolonged culture of embryos to optimize biopsy timing.

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Biographical Sketch Jensen Reckhow is a PGY-3 Resident in Obstetrics and Gynecology at Mayo Clinic. She completed her BS in Environmental Engineering and MPH at Yale University. She conducted translational immunology research at NIH for two years prior to attending Ben Gurion University in Israel for medical school. This is her first time attending

and presenting at ASRM and she is looking forward to learning from this passionate and inspiring community.

Within the past 2 years, have you or your spouse/partner had any potential COI?

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Biographical Sketch Early success, marked by his first publication in CELL at Harvard Medical School, inspired Joseph to continue his research endeavors in reproductive endocrinology and infertility. Joseph has been with Reproductive Medicine Associates of New York since 2011. Joseph has authored over 400 peer-reviewed abstracts & manuscripts. Passionate about development, he cultivates relationship with investors & entrepreneurs to advance reproductive endocrinology & infertility care.

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Organization Name	Relationship Type	Who has this Relationship?	
Progyny	Company Officer Relationship Began - Friday, August 25, 2017 Relationship Ended - Thursday, June 1, 2023 Paid Consultant Relationship Began - Relationship Ended -	Self	

Organization Name	Relationship Type	Who has this Relationship?	
	Direct Stockholder Relationship Began - Friday, August 25, 2017 Relationship Ended - Friday, November 1, 2024		

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Biographical Sketch Richard Slifkin, MS, TS(ABB), CLT(NYS) serves as the Associate Laboratory Director at Reproductive Medicine Associates of New York. Rick is a frequent presenter and has led the development and dissemination of best practices for embryology laboratory efficiencies and how to employ emerging technologies to lower staff burnout while improving pregnancy rates and integrity of specimen identity.

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