TRENDS IN EMBRYO DISPOSITION IN THE ERA OF PGT-A

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Background: Advances in assisted reproductive technology (ART) practices have left many patients with supernumerary embryos after completion of family-building. Patient options include continued storage, discarding, donating to research, donating for use by other patients, and compassionate transfer. Recent national and state legal decisions have threatened or limited ART practices in some states through legislation and/or court decisions subsequent to the reversal of *Roe v. Wade*. Such legal environments have the potential to impact ART providers in their counseling and patients in their decision-making regarding disposition of embryos.

Objective: To evaluate current trends in disposition of embryos to understand the potential future impact of recent legislature changes.

Materials and Methods: All cases of discard or donation of usable frozen embryos occurring between January 2014 and September 2024 at a university-affiliated infertility practice were analyzed. Usable embryos were defined as high-quality blastocysts as assessed by morphology that were either deemed euploid by preimplantation genetic testing for aneuploidy (PGT-A) or not tested for aneuploidy. The proportion of cases in which embryos were discarded, donated to research, or donated for use by other couples was assessed. Analyses of trends over time as well as unadjusted analyses of the impact of PGT-A status and achievement of live birth were performed.

Results: As of September 2024, approximately 46,000 embryos remained stored at our facility. In the past ten years, storage was discontinued for 11,728 usable embryos, representing a discontinuation rate of about 25%. Of these 11,728 embryos, 10,988 (94.7%) were discarded and 740 (5.3%) were donated. The percentage of embryos that were discarded compared to donated increased from 88.2% in 2014 to 99.6% in 2024. Amongst donated embryos, when the opportunity to donate embryos to research was available, this was elected more frequently (59.5% of cases) compared to directed donation (2.4%) or donation to programs (18.4%). Among PGT-A tested embryos deemed euploid over the ten-year period that were not maintained in storage, 95.8% were discarded and 4.2% were donated. Of the embryos that were discarded, 23.7% were deemed euploid by PGT-A testing, while 76.3% were untested. Of the embryos that were donated, 15.1% were deemed euploid by PGT-A, with 84.9% untested. Achieving a live birth was associated with an increased likelihood of donating compared to discarding remaining embryos (odds ratio [OR] 1.43, 95% confidence interval [CI] 1.13-1.80). PGT-A euploid status (compared to untested embryos) was associated with an increased likelihood of discarding compared to donating embryos (OR 1.54, 95% CI 1.20-1.98).

Conclusions: The majority of embryos that were not maintained in storage were discarded rather than donated, with rates of embryo donation noted to decrease over time. The majority of both discarded and donated usable embryos were not PGT-A tested. Not achieving a live birth and PGT-A euploid status were each individually associated with an increased likelihood of discarding compared to donating embryos. Without legal protection, the majority of patients in some states would lose the ability to determine the fate of their supernumerary embryos.

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