The clinical value for re-biopsy, frozen and thaw of test-failure blastocysts in preimplantation genetic diagnosis cycle

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STUDY QUESTION: Is there a clinical value to do the second round of biopsy, vitrification and thawing for test-failure blastocyst from first biopsy in preimplantation genetic diagnosis / screen (PGD/PGS) cycle? Does the extra manipulation have detrimental effect on the implantation potential of blastocysts?

SUMMARY ANSWER: Test-failure blastocysts have high survival ability and implantation potential after second round of biopsy, vitrification and thawing. This provide more chance for pregnancy in PGD/PGS practice.

WHAT IS KNOWN ALREADY: Blastocyst biopsy combined with frozen embryo transfer is more adopted in PGD/PGS program, and about 2~7% of the biopsied blastocysts were reported to be test failure due to various reason and were excluded for transfer. Previously, there was only case report of successful pregnancy after re-biopsy of blastocysts following allele dropout after day 3 biopsy, but there is no clinical data for the value of blastocyst re-biopsy up to date.

STUDY DESIGN, SIZE AND DURATION: This was a retrospective study of the clinical outcomes of 77 re-biopsy cycles for 106 blastocysts from October 2011 to September 2013.

PARTICIPANTS/MATERIALS, SETTING, METHODS: From 77 re-biopsy cycles, 106 blastocysts were thawed and those survived blastocysts underwent re-biopsy. The blastocysts were then vitrified again and stored. The blastocysts diagnosed to be normal by SNP array were thawed and only re-expanded blastocysts were transferred either alone or with other non-re-biopsied blastocysts in natural cycle.

MAIN RESULTS AND THE ROLE OF CHANCE: In total of 1855 blastocysts from 403 PGD/PGS cycles, 106 blastocysts (5.7%) failed in genetic test due to various reasons. After thawing, 73 blastocysts survived and underwent successful re-biopsy. Three re-biopsied samples had unsuccessful amplification. In the other 70 samples, 31 were diagnosed to be chromosomal normal (44.3%) and 39 were abnormal. The 31 normal blastocysts came from 29 cycles, among which 18 frozen embryo transfers were carried out. 19 re-biopsied blastocysts had been warmed and 18 survived (surviving rate 94.7%). Ten cycles has single blastocyst transfer and resulted in 50% implantation rate, and no early miscarriages were observed to date.

LIMITATIONS, REASONS FOR CAUTION: The long-term effects of second round biopsy, vitrification and thawing on late pregnancy and the health of offspring need to be further monitored to evaluate the safety of this manipulation.

WIDER IMPLICATIONS OF THE FINDINGS: For test-failure blastocysts, it could be a routine practice to do the biopsy again to increase the chance for a normal blastocyst for transfer.

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