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Multinucleated blastomeres is not always a predictor of chromosomal aneuploidy in human embryos

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Introduction: Multinucleated blastomeres (MNBs) in human embryos are more frequent in embryos with poor morphology and are associated with lower pregnancy rates following transfer. Although it is reasonable to hypothesize that such structural faults might be associated with the low developmental competence, whether these abnormalities lead to aneuploidy and mosaicism at subsequent developmental stages is not known. Here, we assessed whether an appearance of MNB affect the aneuploidy of the human embryos or not.

Materials & methods: This study was approved by the local ethics Institutional Review Board of IVF Namba Clinic and Japan Society of Obstetrics and Gynecology. Vitrified pronuclear stage oocytes donated from couples who had completed their fertility treatment and who gave informed consent were used for the in vitro imaging study. Chromosome dynamics of embryos was also observed using a confocal laser microscope (CLM) inside an incubator after an injection of mRFP1 fused with histone H2B. Chromosomal euploidy of blastocysts were examined using comparative genomic hybridization. Based on imaging data, embryos which showed MNBs at 2-cell stage under a light microscope were transferred.

Results: Imaging study revealed that 80% of embryos (28/35) showed MNBs at 2-cell stage after RNA injection and imaging. Nevertheless, 43% of embryos with MNBs (12/28) developed to the blastocyst stage and half of them were euploidy. Four embryos (27%) which were observed MNBs under a light microscope transplanted following transfer and one healthy baby was born. Our data suggested that an appearance of MNB is not always a predictor of chromosomal aneuploidy.