Exploring a laser-free trophectoderm biopsy method: a commentary on a new innovative approach

The journal article titled "An innovative design for trophectoderm biopsy without laser pulses: A step-by-step demonstration" by Xue et al. (1) presents a novel method for performing trophectoderm (TE) biopsy during preimplantation genetic testing. Although the efficacy of preimplantation genetic testing for aneuploidy itself is controversial, the article focuses on improving techniques for trophectoderm biopsy. A TE biopsy is a pivotal procedure in preimplantation genetic testing. It has traditionally relied on laser pulses for cell detachment, a process not devoid of challenges. Potential laser-associated thermal damage, operational complexity, and extended biopsy times are among the challenges faced during this procedure (2). The power and number of laser shots may influence the incidence of mosaicism in the embryo, but this is still considered a controversial subject, and the full effects of the laser-associated thermal damage have not been understood fully (3).

In this preceding article, the investigators, Xue et al. (1), unveil a novel approach to TE biopsy. This innovative method centers around specifically designed micropipettes. Both the biopsy and holding pipettes feature unique characteristics, including a sharp flat end with an inclined plan on the holding pipette and a narrow hourglass shape within the biopsy pipette. The sharp, flat plane on the holding pipette minimizes the risk of slipping during the "flick" technique of biopsy. The narrowed shape of the biopsy pipette traps the cell piece, minimizing sample loss.

This study presents a step-by-step demonstration supported by narrated footage. This step-by-step demonstration and narrated video footage help readers understand the new proposed procedure for different-stage blastocyst embryos. This article presents quantitative data on several outcome measures, including biopsy time and sample loss rate. This method presented by Xue et al. (1) holds promise for improving efficiency and minimizing laser pulses and sample loss during TE biopsy. The simplicity of this technique and the reduction in sample loss are particularly important for trainees. This may shorten the training period required for embryologists learning how to perform a TE biopsy. This method may be easier to master than other techniques currently used for TE biopsies.

Although this study appears promising, it is essential to critically evaluate this new technique and the efficacy of this new design. The step-by-step video demonstrates the biopsy of only good-quality embryos; this method's efficacy on poorer-quality embryos has yet to be discovered.

This article provides a well-structured and informative presentation of an innovative TE biopsy technique. Although the article claims to eliminate the need for laser pulses, it may only greatly diminish their need because laser pulses would still be required to breach the zona pellucida on nonhatching embryos. Further studies independently validating its use are important to establish the reliability and credibility of this technique. Further peer review and validation of this method's efficacy in different settings are needed to fully understand this approach's benefits.

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