



Can High-Dose hCG Improve Oocyte Maturation in Patients with LHCGR Polymorphism

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INTRODUCTION/BACKGROUND

This case is presented to highlight the importance of personalized ovarian stimulation strategies in patients with LHCGR polymorphism, specifically addressing oocyte maturation challenges through tailored high-dose hCG protocols.

OBJECTIVES/AIMS

A 37-year-old patient presented with primary infertility after eight months of unsuccessful attempts despite normal ovarian reserve (AMH: 2.1 ng/mL, AFC: 12), ovulatory function, and tubal patency. Her partner's semen analysis met WHO 2021 criteria for normal fertility. Initial ovarian stimulation was performed using a short antagonist protocol with triptorelin 0.2 mg as the trigger for final oocyte maturation, administered 37 hours before oocyte pick-up (OPU). Of 16 aspirated follicles, 12 oocytes were retrieved, with 10 arrested at the metaphase I (MI) stage. Fertilization via conventional IVF resulted in two 2PN zygotes and one OPN zygote.

Due to the high proportion of immature oocytes, genetic testing was conducted, revealing an LHCGR polymorphism (g.48694236T>C; c.935A>G; p.Asn312Ser; rs2293) with a G/G genotype, which is associated with poor LH receptor sensitivity. A subsequent cycle utilized a dual trigger (triptorelin 0.2 mg + hCG 250 µg), administered 38 hours before OPU, but all retrieved oocytes remained immature.

A third stimulation cycle was initiated using a minimal stimulation protocol with letrozole 5 mg daily combined with urinary gonadotropin (Humog) 75 IU. To address the reduced LH receptor sensitivity, an ultra-high dose of hCG (20,000 IU) was administered alongside triptorelin 0.2 mg 38 hours before OPU. This approach resulted in the retrieval of five mature oocytes, yielding four 2PN zygotes and two high-quality blastocysts (4AA and 4BA). Preimplantation genetic testing for aneuploidy (PGT-A) confirmed euploid status of the embryos, leading to a successful embryo transfer.

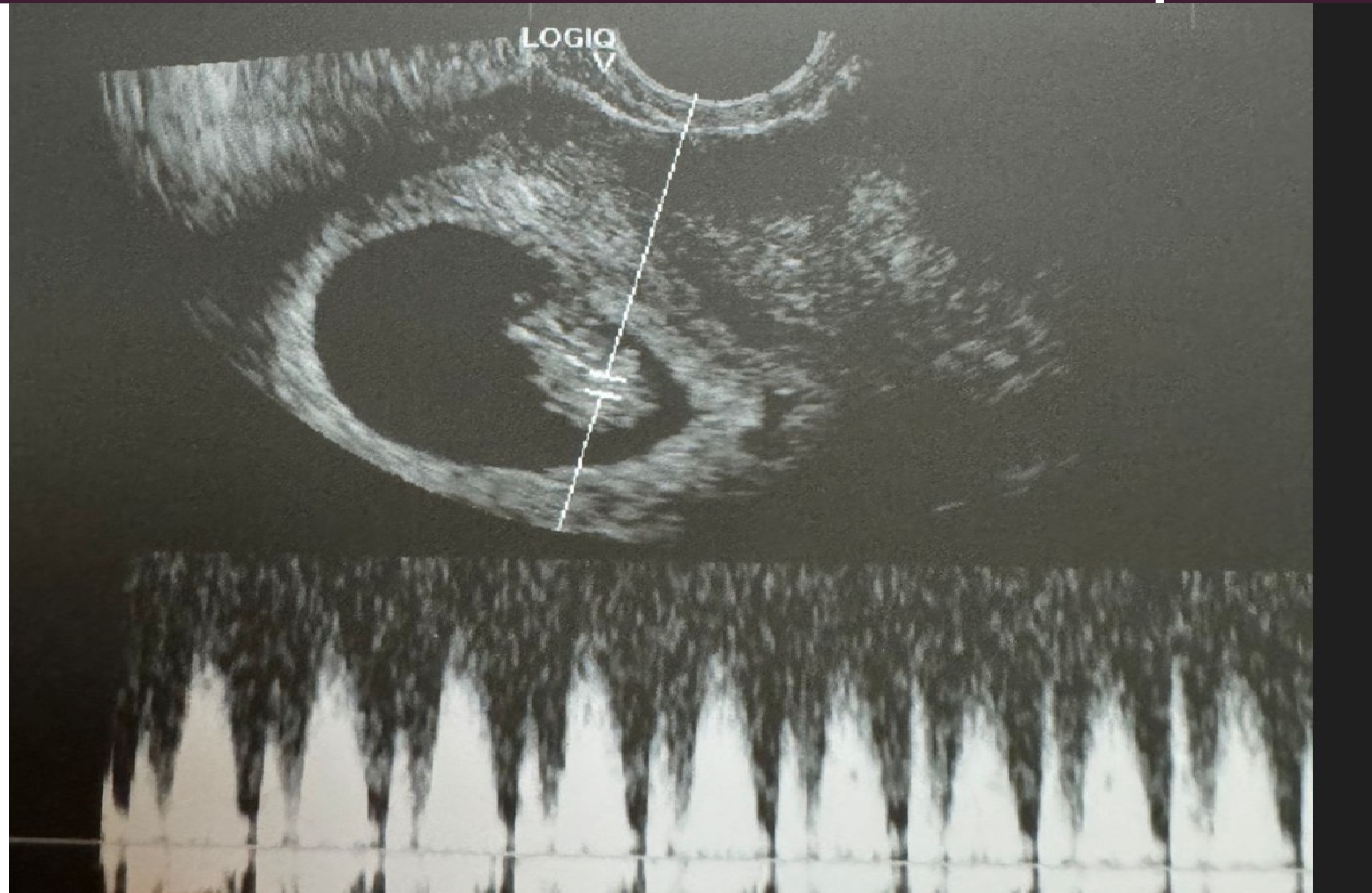
RESULTS

A third stimulation cycle was initiated using a minimal stimulation protocol with letrozole 5 mg daily combined with urinary gonadotropin (Humog) 75 IU. To address the reduced LH receptor sensitivity, an ultra-high dose of hCG (20,000 IU) was administered alongside triptorelin 0.2 mg 38 hours before OPU. This approach resulted in the retrieval of five mature oocytes, yielding four 2PN zygotes and two high-quality blastocysts (4AA and 4BA). Preimplantation genetic testing for aneuploidy (PGT-A) confirmed euploid status of the embryos, leading to a successful embryo transfer.

CONCLUSIONS

This case underscores the necessity of individualized ovarian stimulation in patients with LHCGR polymorphisms. It demonstrates that high-dose hCG, in combination with minimal stimulation, can effectively overcome maturation challenges and improve ART outcomes. The findings suggest that standard stimulation protocols may be insufficient for patients with genetic variations affecting LH receptor function.

Tailored ovarian stimulation strategies incorporating high-dose hCG can enhance oocyte maturation and embryo quality in patients with LHCGR polymorphism. Further research is needed to optimize stimulation protocols and explore the broader applicability of these findings in clinical practice.



Pelvic Ultrasound proving the successful adhesion and implantation of the chorion, and visualising uterine pregnancy of 7-8 gestational weeks

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