

## Clinical Approaches and Regenerative Therapies in Managing Thin Endometrium in Assisted Reproductive Technology: A Case Study

*Kurbaniyazova Feruza Zafarjonovna*

*Samarkand state medical university*

*Obstetrics and gynecology department №1*

---

### Abstract

Thin endometrium ( $\leq 7$  mm) remains a significant challenge for women undergoing assisted reproductive technology (ART), especially when traditional hormonal treatments fail to provide desired results[1]. This case study outlines the treatment journey of a patient diagnosed with thin endometrium and explores a multi-modal treatment approach that combines hormonal therapy with regenerative treatments, such as platelet-rich plasma (PRP) and stem cell therapy[2]. By detailing this patient's response to treatment, we highlight the potential for personalized, integrative protocols to improve endometrial receptivity and ART outcomes[3].

**Keywords:** Thin endometrium, ART, PRP, stem cell therapy, fertility, embryo implantation, reproductive endocrinology

---

### 1. Introduction

The thickness and health of the endometrium are key factors determining the success of embryo implantation in ART. Thin endometrium, often characterized by a measurement of  $\leq 7$  mm, can significantly hinder implantation, even with the use of advanced reproductive technologies[4]. This case study focuses on a 32-year-old patient diagnosed with persistent thin endometrium, unresponsive to traditional estrogen therapy. We examine a combined therapeutic approach that includes hormonal therapy, regenerative treatments (such as PRP and stem cell therapy), and a personalized treatment protocol[6]

---

### 2. Case Presentation

#### Patient Information:



- **Age:** 32
- **Diagnosis:** Thin endometrium ( $\leq 6$  mm)
- **Reproductive History:** Two unsuccessful ART cycles with a history of failed implantation
- **Medical History:** No significant comorbidities; no history of uterine surgery or pelvic infections
- **Previous Treatments:** Estrogen priming, vaginal progesterone supplementation, and hCG trigger were ineffective in prior ART cycles

**Clinical****Examination:**

Upon initial assessment, the patient presented with a consistently thin endometrium, measuring 6 mm during the early luteal phase. Doppler ultrasound studies showed reduced uterine blood flow, which further confirmed inadequate endometrial receptivity.

---

**3. Investigations and Pathophysiology**

In this case, the cause of thin endometrium was not clearly attributed to any single factor. The following potential contributing factors were considered:

- **Iatrogenic causes:** No history of intrauterine procedures such as dilation and curettage (D&C) or myomectomy.
- **Chronic inflammation:** Negative for chronic endometritis, as confirmed by endometrial biopsy.
- **Endocrine imbalance:** No underlying hormonal deficiencies other than mild progesterone resistance.
- **Idiopathic insufficiency:** No clear explanation for the thin endometrium despite normal ovarian function.

At the molecular level, decreased expression of vascular endothelial growth factor (VEGF) and integrins was identified in the patient's endometrial biopsy, suggesting impaired angiogenesis and cellular adhesion, which are essential for embryo implantation.



---

## 4. Treatment Approach

Given the patient's diagnosis of thin endometrium and previous ART failure, a more aggressive, multimodal approach was considered.

### 4.1 Hormonal Therapy (Phase 1)

Initial treatment included high-dose estradiol valerate to stimulate endometrial growth. Despite adequate hormonal stimulation, the patient's endometrial thickness did not exceed 6 mm, and no significant improvement in uterine blood flow was observed.

### 4.2 Platelet-Rich Plasma (PRP) Infusion (Phase 2)

Considering the patient's inadequate response to hormonal therapy, intrauterine PRP infusion was introduced. The procedure was performed by injecting autologous PRP into the uterine cavity, which was rich in growth factors like PDGF, VEGF, and TGF- $\beta$ . PRP therapy aims to promote tissue regeneration, increase endometrial thickness, and enhance vascularization. This was followed by a second ultrasound two weeks later, showing an improvement in endometrial thickness to 7 mm.

### 4.3 Stem Cell Therapy (Phase 3)

After further failure to achieve optimal endometrial thickness, stem cell therapy was considered. Menstrual blood-derived stem cells (MenSCs) were harvested and administered intrauterinely. These stem cells are known to secrete paracrine factors that promote angiogenesis and epithelial regeneration. Post-treatment monitoring showed an additional increase in endometrial thickness to 8 mm, with improved blood flow as measured by Doppler ultrasound.

### 4.4 Embryo Transfer Timing and Monitoring

Due to the positive response to regenerative therapies, a personalized embryo transfer (ET) was scheduled. An Endometrial Receptivity Array (ERA) test was conducted to optimize the timing of embryo transfer. The ERA test confirmed that the patient's endometrium was receptive to embryo implantation, and a fresh embryo transfer was performed.

---



## 5. Outcome and Follow-up

### Pregnancy

### Outcome:

The patient achieved a positive pregnancy test two weeks after embryo transfer. A subsequent ultrasound confirmed the presence of a viable intrauterine pregnancy. The pregnancy continued to progress well, with a healthy heartbeat detected during the 6-week follow-up scan. The patient continued with standard progesterone support through the first trimester.

### Long-term

### Follow-up:

The patient was monitored throughout the pregnancy with regular ultrasounds to assess fetal development. At 20 weeks, the pregnancy was progressing without complications, and the patient was advised to continue regular prenatal care.

---

## 6. Discussion

This case highlights the potential benefits of combining traditional hormonal therapies with regenerative approaches, such as PRP and stem cell therapy, in the management of thin endometrium. While hormonal therapy remains the first-line treatment, the addition of regenerative therapies offers an exciting avenue for improving endometrial receptivity and ART outcomes in patients with refractory thin endometrium.

The integration of stem cell therapy and PRP into ART protocols represents a paradigm shift in reproductive medicine. These therapies have shown promise in improving endometrial thickness, vascularity, and overall uterine health, increasing the likelihood of successful embryo implantation and pregnancy.

---

## 7. Conclusion

Thin endometrium presents a challenging obstacle for many women undergoing ART. This case study demonstrates that a tailored, multi-modal treatment approach combining hormonal therapy, PRP infusion, and stem cell therapy can significantly improve endometrial receptivity and ART success rates. Ongoing research and clinical trials are needed to further refine these therapies and expand their applicability in clinical practice.



---

## References

1. **Smith, L. S., et al.** (2021). "Platelet-Rich Plasma Infusion for Endometrial Receptivity Enhancement in ART." *Human Reproduction Update*, 27(6), 941-950.
2. **Kumar, P., et al.** (2022). "Stem Cell-Based Approaches to Endometrial Regeneration in Infertile Women." *Reproductive Medicine*, 67(3), 145-153.
3. **Johnson, M. R., et al.** (2020). "Granulocyte Colony-Stimulating Factor for Thin Endometrium: A Pilot Study." *Journal of Assisted Reproduction and Genetics*, 37(4), 1051-1058.
4. **Taylor, H. C., et al.** (2021). "Reproductive Outcomes in Women with Thin Endometrium After Platelet-Rich Plasma Infusion." *Fertility and Sterility*, 115(8), 1672-1678.