



**A Case Report of Platelet-Rich Plasma Therapy for Thin Endometrium**

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**Abstract**

*A 36yrs old female with secondary infertility and POR came to us for IVF. The patient had a history of pregnancy termination & D&C done for pregnancy with Down Syndrome. Post procedure her USG revealed a thin endometrial lining meaning between 5-6mm. Diagnostic Hysteroscopy was performed to rule out intrauterine adhesions and findings revealed cavities with minimal adhesions.*

*Ovarian stimulation and oocyte retrieval was carried out, two good quality embryos were formed. Embryos were sent for PGT-A. One embryo was confirmed to be euploid. Endometrial preparation was done using a combination of estrogen supplementation, G-CSF, oral sildenafil and PRP was done for her. The regimen resulted in improved endometrial thickness of approx 7mm with tri-laminar pattern. The euploid embryo was transferred leading to single intrauterine pregnancy.*

**Introduction**

Infertility is a global health issue and 13% of couples suffer from this. Pregnancy rates can be high by increasing the ET thickness, the minimum thickness required is 7 mm.

Thin endometrium significantly increased the risk of embryo implant failure as pregnancy rate in women with <6mm of endometrial thickness was only 29.43% .[1,2]

There is growing interest in the use of PRP to improve ART outcomes. White blood cells and platelets produce and secrete cytokines and growth factors some of which are known for their association with embryo implantation. PRP has been used particularly as an agent to induce endometrial growth in patients whose endometrium lining does not reach the desired thickness (>7mm) for embryo transfer. Results have shown improved ART outcomes associated with increased ET after PRP administration. (Chang et al., 2015; Tandulwadkar et al., 2017; Zadehmodarres et al., 2017; Molina et al., 2018).

PRP therapy is an inexpensive, non-invasive technique. It is composed of high platelet concentration plasma from peripherally drawn blood. Plasma contains protein, hormones & cytokines and stimulates growth, division and proliferation of cells.

## Case Presentation

### Patient information

A patient visited a test tube center in noida, india, where it was determined that a 36yr old female patient had secondary infertility.

### Medical/surgical history

Patient had POR and previous history of 2 IUI procedure. They had history of dilation and curettage post abortion of baby with down syndrome at 12 weeks of gestation. There was no medical history of either partner having asthma, heart issue, tuberculosis or hypertension. Couple family history was also negative.

### Physical examination

Male partner had BMI(Body Mass Index) of 25.6 kg/m<sup>2</sup> while the female had BMI of 23.5 kg/m<sup>2</sup>. According to husband's semen analysis, morphological defect was 96%, motility was 64% and sperm count was 60 million/ml. His semen had normal morphology of 4%. His report stated that semen profile was normozospermia. Table 1 shows semen report.(3).

Parameter	Observed Limit	Reference limit (WHO 2021)
Semen volume	1.8 mL	>1.4 mL [8]
Morphological defects	94%	96% [8]
Normal morphology	6%	>4% [8]
Vitality	47%	>54% [8]
Progressive motility	30%	>30% [8]
Count	40 mil/mL	16 mil/mL [8]
pH	7.2	>7.2 [8]
Color	Opaque white	Opaque white [8]
Viscosity	Liquified	

(8th reference) - see the table

**Table:** Semen parameter of the male partner.

The female partner underwent ultrasonography and shows POR, for a thin endometrium 5mm was suggested hysteroscopy. Her hormonal levels showed AMH level of 1.5 mIU/mL and an FSH level of 12IU/mL

## Treatment

Gonadotropin injections were started to patients and antagonists were added that helped to control timing and ovulation and help in growth of follicles in the ovary. A trigger was given to her for oocyte pickup. After 36 hours oocyte pickup was done. During OPU 8 oocytes was retrieved and 5 were in MII stage, two at MI stage and one at GV stage. Two good quality blastocyst was formed 4AA & 4AB. Embryos were sent to PGT-A and one embryo came out to be Euploid. Which was transferred post PRP and Hysteroscopy procedure.

We advised PRP treatment for thin endometrium. A 5ml of peripheral venous blood is drawn in the syringe containing 2.5ml of acid citrate A Anticoagulant solution (ACD-A). Blood is centrifuged immediately at 1200rpm for 12min to separate the red blood cells.

Plasma is centrifuged again at 3300rpm for 7 minute to obtain the PRP. The 0.5ml of PRP is inserted into uterine cavity with IUI catheter. We did two sitting of PRP for patient and the endometrium thickness reached to 7.8mm triple line which was good for implantation.(PIC of USG).



**BEFORE PRP**



**AFTER PRP**

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**Follow up**

After embryo transfer, the patient was instructed to take all the prescribed medication on time. After 14 days of embryo transfer, the serum B-HCG level was done which was 843 mIU/mL. After her conceiving first USG was done which showed single live intrauterine pregnancy of 6 weeks 2 days and she is on regular follow up at the clinic.

**Discussion**

PRP is defined as plasma fraction of autologous blood with intensive platelet concentration and growth factors that improve cytokine milieu and cellular proliferation.

In their cases, Intrauterine PRP was used, which affected the thickness of the endometrium in women undergoing IVF cycles. PRP intrauterine infusion significantly improves endometrial thickness, embryo implantation and clinical pregnancy rate.

Chang et al. were the first to describe the effectiveness of intrauterine PRP in improving endometrial thickness in women with thin endometrium (4).

Research on PRP injection sub-endometrially improved clinical pregnancy rates for thin endometrium patients (5).

In our case, uterine curettage had occurred which led to injury and chronic inflammation of the endometrium. The functional impairment or mechanical damage resulted in decreased endometrial regenerative activities and increased implantation failure.

The commonly accepted minimal endometrial thickness is 7 mm, and we used a diagnostic cut-off of 7 mm to define thin endometrium (6).

PRP has a high concentration of growth factors and cytokines, and can stimulate proliferation and mitogenesis of endometrial cells and then activates endocrine - paracrine pathway for improving the endometrial response to promote embryo implantation and pregnancy. (7)

Autologous PRP is safe, readily available, and inexpensive, making it a promising treatment for women with refractory endometrium. If performed under short aseptic conditions, adverse effects are very minimal.

The procedure would decrease emotional, psychological and financial burden faced by patients with thin endometrium who would otherwise face risk of repeated cancellation or recurrent implantation failure.

However large scale randomised trial is needed to optimise the success rate of the PRP Procedure.

## Conclusion

In conclusion, the present case aims to call attention to positive effects of PRP which acts mostly by triggering endometrial receptivity rather than promoting growth. It helps in increasing implantation rate & clinical pregnancy rate as it contains growth factor & cytokines that have positive effect on local infertile women with endometrium <6mm. Since PRP is autologous it is an easily obtained, inexpensive & safer protocol used from patients own blood. If performed under aseptic conditions, adverse effects are virtually none. tissue repair & endometrial receptively.

The findings need more evidence based randomized trials with larger samples.

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