Mira assisting in clinical evaluation and treatment

Infertility Case Report Utilizing Naprotechnology and Mira

mira

For Healthcare Professionals

Patient background

29 year old female

G0

Initial visit Jan 2023
for infertility of 7 years

Weight: 144 lb

Height: 5 ft 5 in

BMI: 24.2

No allergies

Medications

None

Supplements

- Generic prenatal vitamin
- Omega 3
- Co Q 10
- Vitamin D3 2,000U

Past medical history

Endometriosis

Prior Interventions

2017/2018
Completed some rounds of Clomid and letrozole.

2019
Did IUI and letrozole along with post peak progesterone capsules

Had 2 lap surgeries for endometriosis
First surgery in 2018 was treated with cautery.
Second surgery in 2021 was completed by a endometriosis specialist who excised stage 3 endometriosi (excised all the endometrial implants and reapproximate tissues). They discovered septum in uterus and completed a septoplasty.

Surgery helped with some of the dysmenorrhea.
Going gluten free has made periods less painful.

Hysterosalpingogram
April 2018 (clear) and April 2021 (clear).

Started IVF process April 2022
Had 8 embryos but only one survived.
Did 1 transfer and it did not work. Did not complete genetic testing.

Menstrual Cycle History

Cycle length
Usually 26-33 days. Most recent cycle 26 days

Duration of flow
5 days

Heavy menses
1st and 2nd day are “heavy”. Reports bleeding through super pad/tampon regularly every 3 hours for first two days

Dysmenorrhea
Currently moderate but previously was severe. Prior to removing gluten 2 years ago patient reported severe cramping and throbbing pain with nausea, diarrhea, and bloating.

Treatment for dysmenorrhea in past
Extra strength Tylenol “around the clock” for two days

Premenstrual spotting
Yes, 5-7 days of spotting before her period comes. This has happened for years.

Tail end brown bleeding
Yes, along with premenstrual cramping, happening for years.

PMS symptoms
Irritability, tearful, cry easily, fatigued, food cravings, breast tenderness and bloating.

Follow up lab review visit: February 2023

- Elevated prolactin (unsure if clinically significant as serum blood drawn was obtained the day after intercourse)
- Low ferritin
- Remaining blood work within normal range
- Suggested low dose naltrexone (LDN) for PMS and endometriosis

Serial Ultrasound Review

Patient completed four ultrasound timed before and after ovulation

The endometrial thickness was good at 10 mm
Found immature follicles

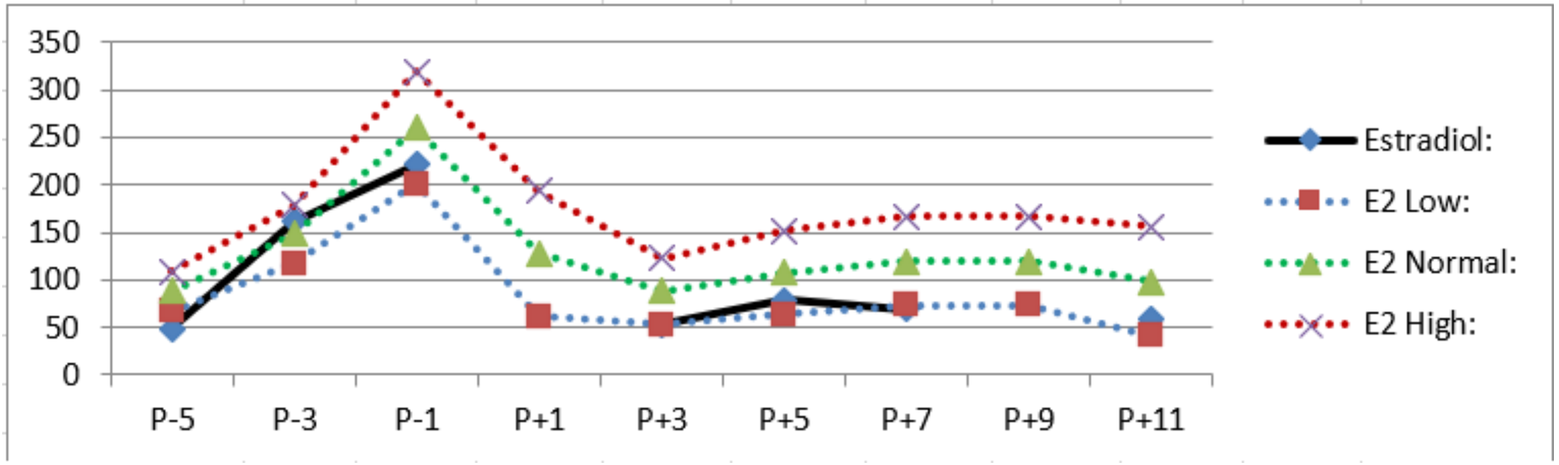
Dominant follicle on the left ovary continued to get larger on the 3 subsequent follow up ultrasounds instead of shrinking after the ovulatory event. It appeared that an immature follicle ruptured to release the egg.

Previously at an IVF clinic, she had seen 2 cysts in past that they thought were endometriomas, smaller in size.

Summary: Concern for ovulation defect

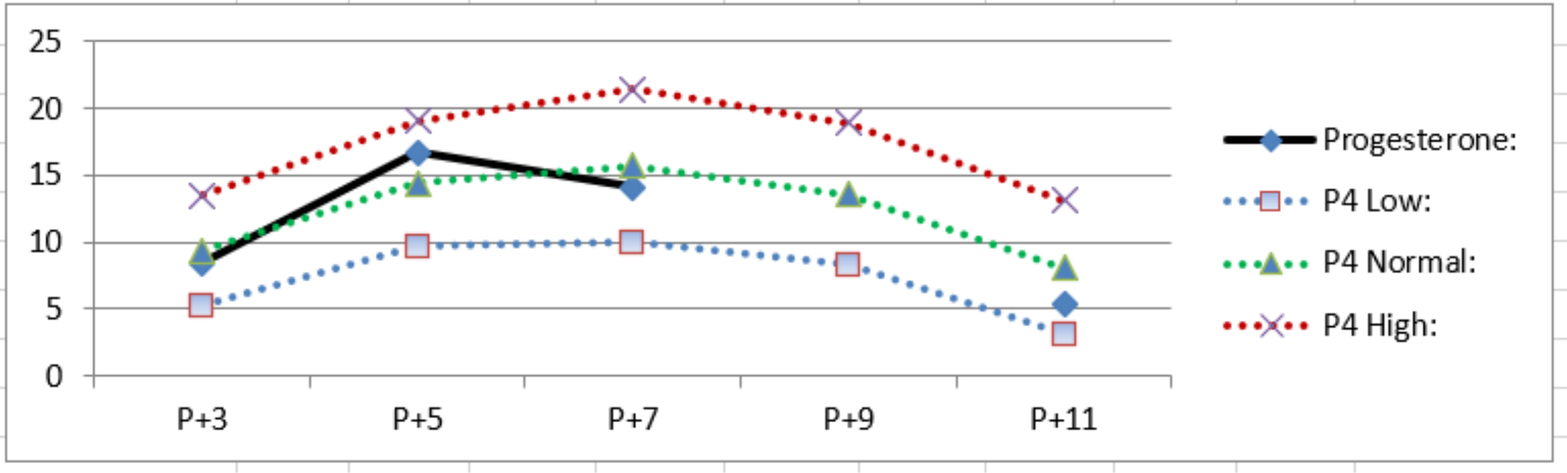
Patient E2 Levels Based on Napro Estradiol Reference Range

Date:									
pg/mL	P-5	P-3	P-1	P+1	P+3	P+5	P+7	P+9	P+11
Estradiol:	49	161	221		53	79	69		59
E2 Low:	67	117	201	62	53	64	73	73	41
E2 Normal:	88	148	260	128	88	108	120	120	98
E2 High:	109	179	319	194	123	152	167	167	156
Date:	3	7	9		13	15	17		22

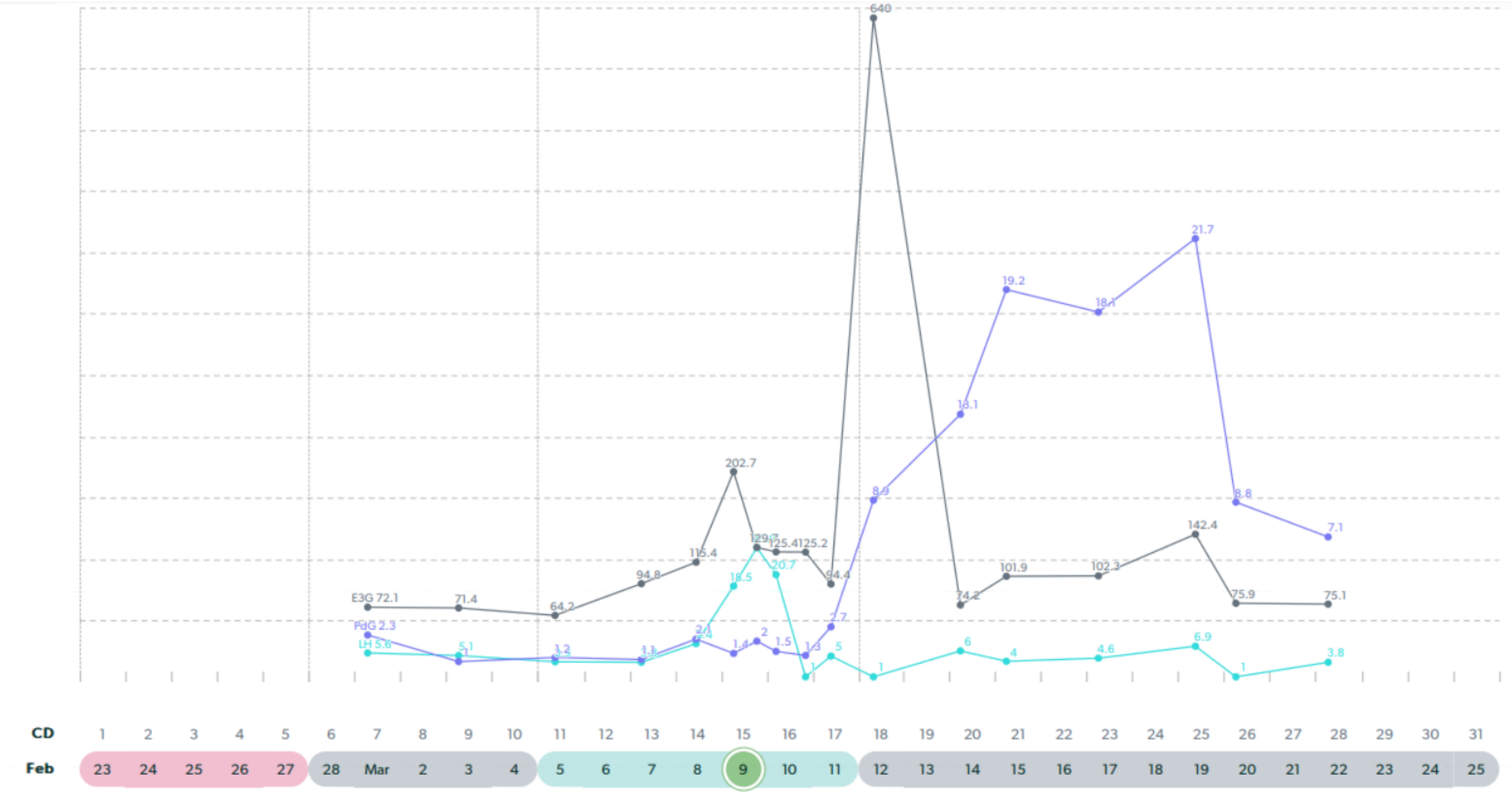


Patient Progesterone Levels Based on Napro Progesterone Reference ranges

NG/mL	P+3	P+5	P+7	P+9	P+11
Progesterone:	8.5	16.7	14.1		5.4
P4 Low:	5.3	9.7	10	8.3	3.1
P4 Normal:	9.4	14.4	15.7	13.6	8.1
P4 High:	13.5	19.1	21.4	18.9	13.1
Date:		15	17		22



Mira urinary metabolite results



Serum Hormone Profile Summary

Using serum and Mira urinary metabolite results, we see that they correlate well to identify:

- Low estradiol pre and post peak, which can lead to immature eggs.
- Late luteal phase defect with progesterone dropped significantly in the second half of the luteal phase.

For years, she had significant spotting 5–7 days prior to menses, and tail end brown bleeding. The data from serum hormones and Mira urine metabolites showed her estradiol and progesterone dropping precipitously at the time that her spotting usually starts.

Serum Hormone Profile Summary

Provider opted to treat low estradiol and low progesterone with Pregnyl (human chorionic gonadotropin) 2,000 U subcutaneous on peak plus 3, 5, 7, 9 (3 days after suspected ovulation, 5 days after suspected ovulation, etc).

Pregnyl treatment stimulates the ovaries to make more estradiol and progesterone in the luteal phase, and can also improve ovulation in subsequent cycles.

Her abnormal spotting resolved after starting Pregnyl 2000 units on peak plus 3, 5, 7, 9.

Follow up Visit: May 2023

- 2 hour oral glucose tolerance test with insulin = normal.
- Hemoglobin A1c is 5.1, excellent.
- Ferritin was very low at 18.
- Started Floranex liquid iron, magnesium glycinate 400 mg daily, and Conception prenatal vitamin.
- Prolactin 25.8, higher than ideal for fertility, so started cabergoline 0.5 mg once a week, then recheck prolactin level in 1 month.

Provider’s Summary

Serum hormonal profile and Mira urine metabolites correlated, confirming follicular phase defect, which was also correlated with ultrasound data showing immature follicle rupturing, which would lead to poor embryo quality.

Poor embryo quality was also suggested by her attempt at IVF, which yielded 8 ova, but only 1 embryo was formed, and that embryo failed to implant.
Serum hormones and Mira also correlated and confirmed late luteal defect, which leads to implantation failure, recurrent miscarriage, and PMS.
Given the relative ease of testing hormones throughout the cycle with Mira, compared to serum hormone testing every other day in a lab, the patient was able to see evidence of improvement with treatment. Seeing improvement in cycle hormones **motivates the patient** to continue with treatment plan and **encourages compliance**.

Provider’s Summary

The Mira testing also suggested (to the patient and the physician) the possibility of additional issues contributing to implantation failure, which prompted further immune workup.

The immune workup indeed showed immune related causes of reproductive failure, which are amenable to treatment.

Further investigation of correlation between serum levels and urine metabolites should be pursued.

Thank you!