How Mira assists in clinical evaluation and treatment

Case Report: Postpartum hormonal imbalances discovered while using a fertility awareness method

mira

For Healthcare Professionals

Mira Webinar

Listen to Mira's Medical Affairs Specialist, Rose MacKenzie, present how women tracking their hormones with Mira can discover underlying hormones imbalances during postpartum amenorrhea.

Watch now

Case report: Patient #1

Patient background

39 y.o. woman, 40 y.o. man
G5P6 (twins)
Last baby born November 2022

Reported regular cycles

History of ongoing constant mucus even after ovulation

Weight: 123 lb
Height: 5 ft 7 in
BMI: 19.4

Past medical history

No significant medical history

Menstrual Cycle History

Patient tracking her fertility with the Clearblue fertility monitor and LH test strips.

After her 5th baby her menstrual cycles return December 2020.

Cycle 1–6 Insignificant pattern.

Cycle 7 LH surge (peak) CD 14, luteal phase 12, cycle length 27.

Cycle 8 LH surge (peak) CD 14, luteal phase 12, cycle length 27.

Cycle 9 Unable to find LH surge (peak), unable to deteremine luteal phase, cycle length 26.

Cycle 10 LH surge (peak) CD 11, luteal phase 14, cycle length 26.

Cycle 11 LH surge (peak) CD 11, luteal phase 14, cycle length 26. Completely weaned from breastfeeding.

Cycle 12 Unable to find LH surge (peak), unable to deteremine luteal phase, cycle length 20.

Cycle 13 (Nov 2021) Unable to find LH surge (peak), unable to deteremine luteal phase, cycle length 18.

Cycle 14 (December 2021) LH surge (peak) CD 9. Intercourse on CD 4 resulted in unintentional conception.

Summary of Problems

History of ongoing constant mucus even after ovulation

Irregular cycles with very short cycles of 18-20 days

Unable to find ovulation in multiple cycles (missed LH surges)

Unintended pregnancy in cycle 14 (December 2021) with intercourse on CD 4 and LH surge on CD 9.

Course of Action

The patient met with a Marquette Method of NFP instructor in Jan 2023 after the birth of 6th baby with the goal of tracking her hormones to avoid a future pregnancy

- The patient’s motivation to avoid pregnancy was high
- The couple planned to take a conservative approach to avoid a pregnancy

The patient began testing her hormones with Clearblue fertility monitor utilizing the Marquette Method Cycle 0: 10 day protocol and tracking temperature with Tempdrop

Postpartum Amenorrhea (Cycle 0)

Initial Chart

Cycle	0	Start date	1/25/2023	Couple intention:				Notes:
		End date		Avoid	x	Achieve		

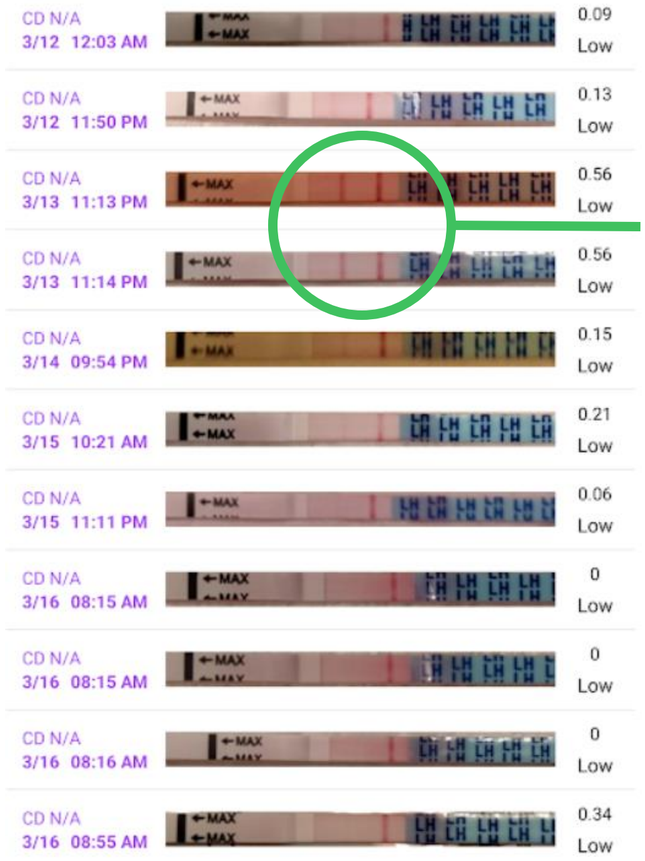
Monitor day	6	7	8	9	10	11	12	13	14	15	5	6	7	8	9	10	11	12	13	14	15	5	6	7	8	9	10	11	12	13	14	15	5	6	7	8	9	10	11	12	13	14	15	5
Date	25	26	27	28	29	30	31	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15																						
Bleeding																																												
Monitor	L	L	L	L	L	L	L	P	-	-	-	L	L	L	L	L	L	L	L	L	P	-																						
Mucus																																												
OPK									N	N	N							N	N	N	P	N	N																					
Intercourse																																												

The patient was tracking fertility with Clearblue fertility monitor and Tempdrop

Problem: Had two non-ovulatory LH surges (lack of thermal shift in temperatures and no menstrual period followed)

Postpartum Amenorrhea (Cycle 0)

Continued



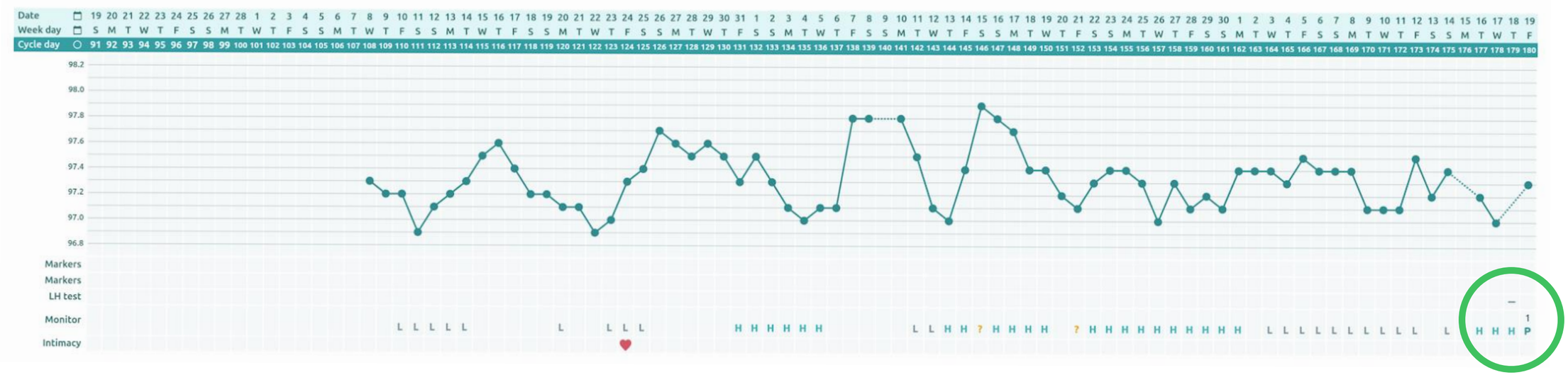
LH surge detected

No thermal shift after LH surge

Problem: The patient had a third non-ovulatory LH surge (lack of thermal shift and no menstrual cycle to follow)

Postpartum Amenorrhea (Cycle 0)

Continued Chart



The patient continued tracking fertility with Clearblue fertility monitor and Tempdrop

Problem: Had a fourth non-ovulatory LH surge on May 19th (lack of thermal shift and no menstrual period to follow

Concerns with hormone pattern

1. The patient had a history of ongoing constant mucus even after ovulation

2. A history of irregular cycles with short cycles of 18–20 days

3. A history of early LH surges (peak days)

4. Multiple non-ovulatory LH surges (false peaks) in postpartum amenorrhea (cycle 0)

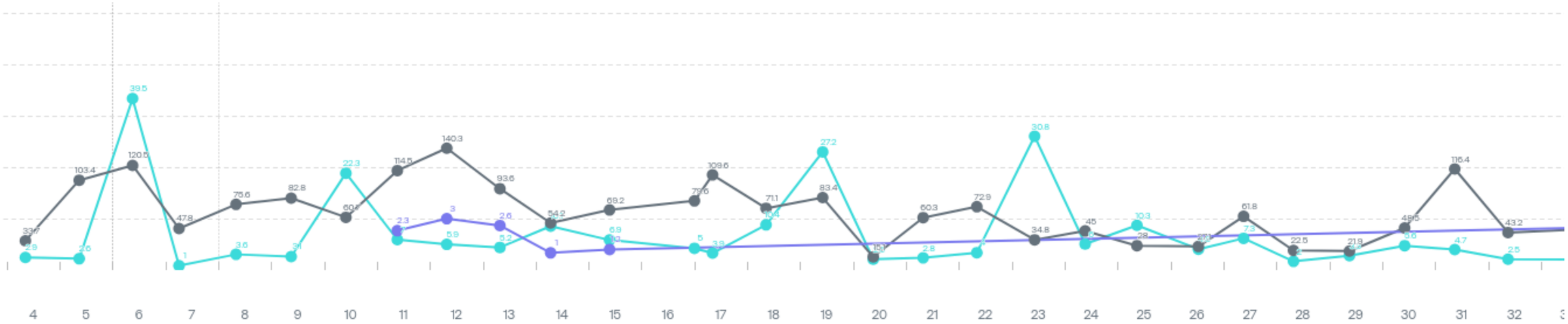
The instructor was concerned about a hormone imbalance such as PCOS

- Suggested Mira for monitoring underlying hormone pattern
- Suggested thorough workup with a restorative reproductive health provider
  (The patient did not complete workup until December 2023)

Postpartum Amenorrhea (Cycle 0)

Initial Mira chart

July 2023



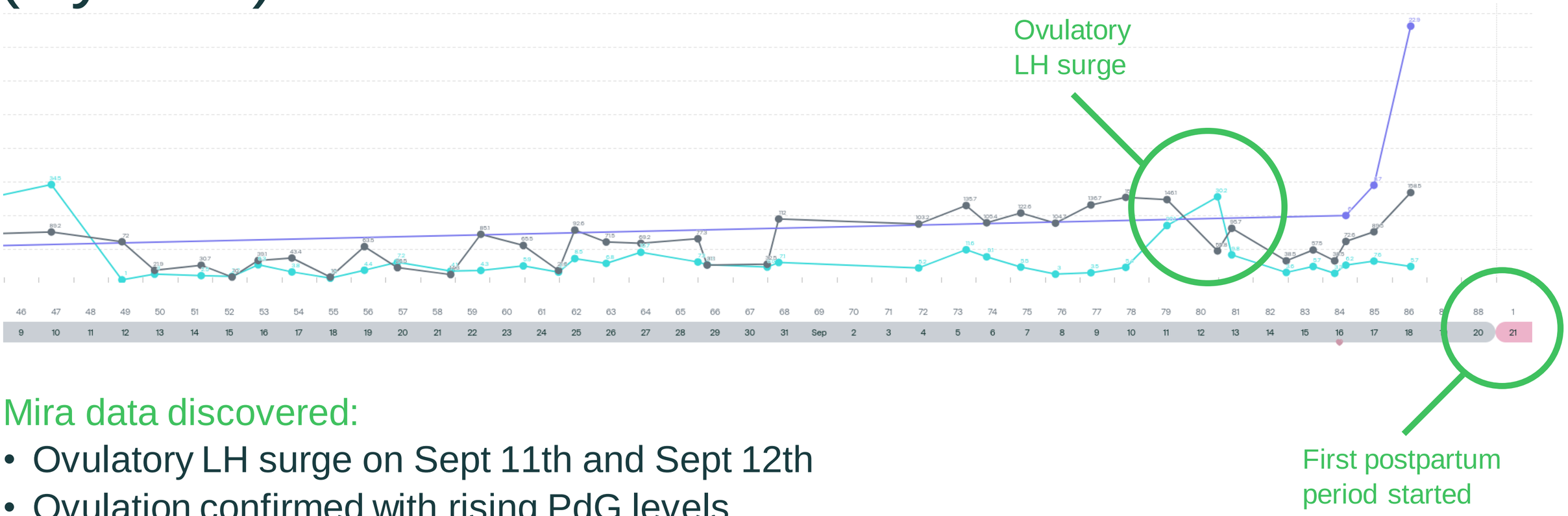
Mira data discovered:

- Frequent abnormal non-ovulatory LH surges
- Lack of coordinated hormones
- Continued hormone imbalance

Problem:

Difficulty identifying infertile pattern

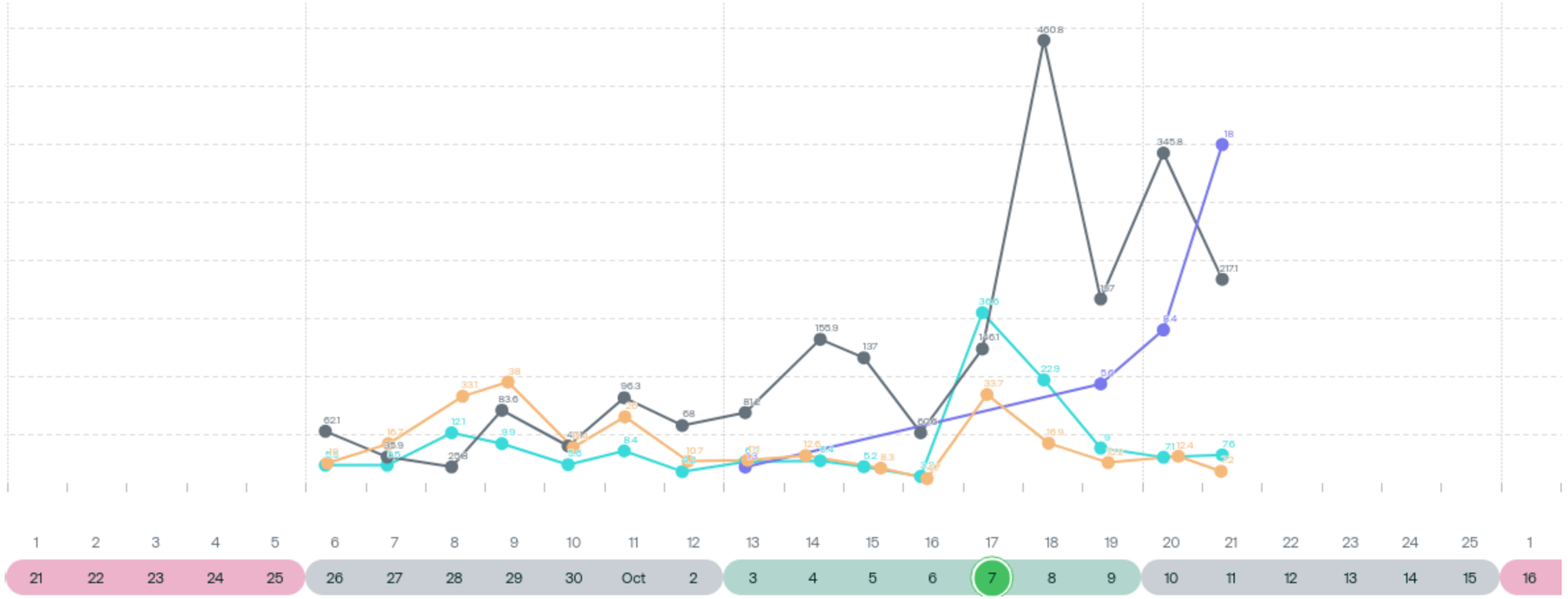
Transitioning from postpartum amenorrhea (cycle 0) to Ovulatory cycles (Cycle 1)



Mira data discovered:

- Ovulatory LH surge on Sept 11th and Sept 12th
- Ovulation confirmed with rising PdG levels
- The first postpartum period started Sept 21st
- Luteal phase 8 days

Cycle 1: First 6 breastfeeding cycles

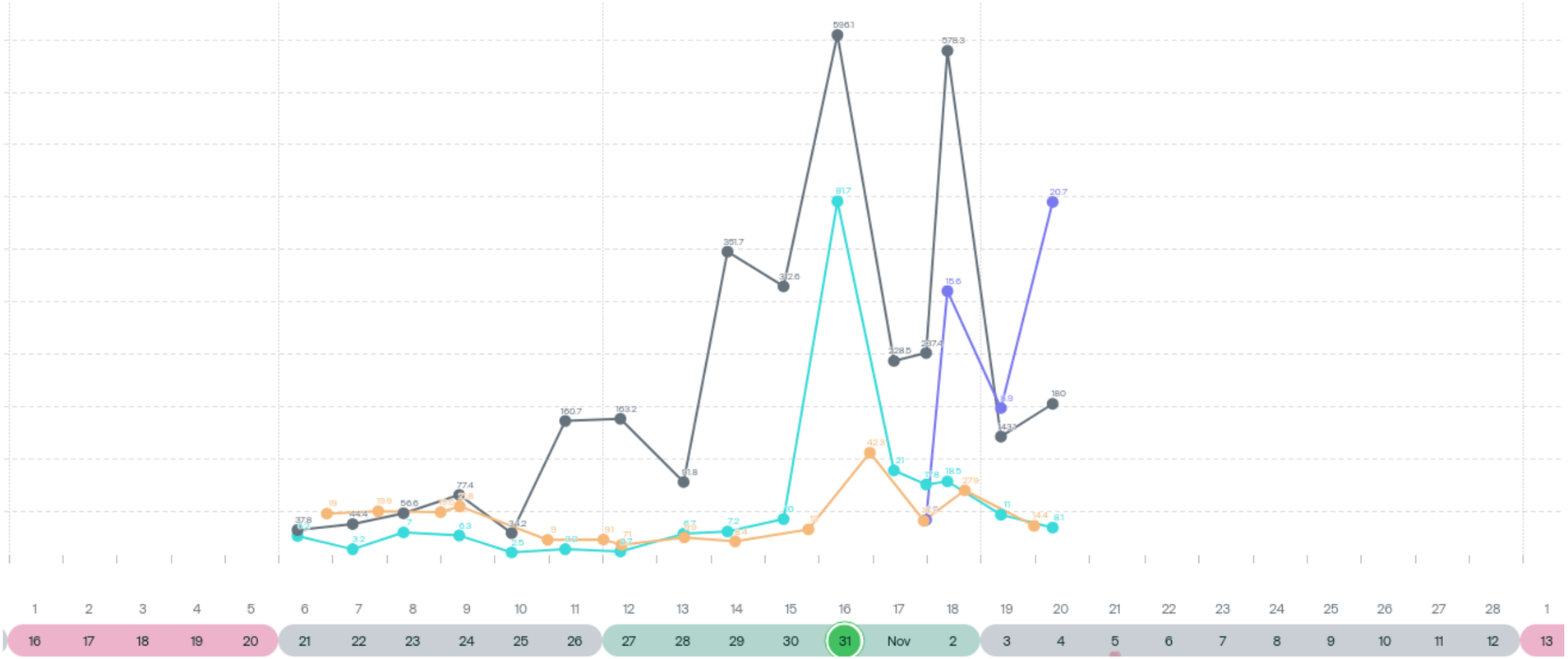


Mira data discovered:

- LH surge on CD 17 and CD 18
- Ovulation confirmed with rising PdG levels
- Luteal phase 7 days

A short luteal phase is common when postpartum breastfeeding for the first several cycles

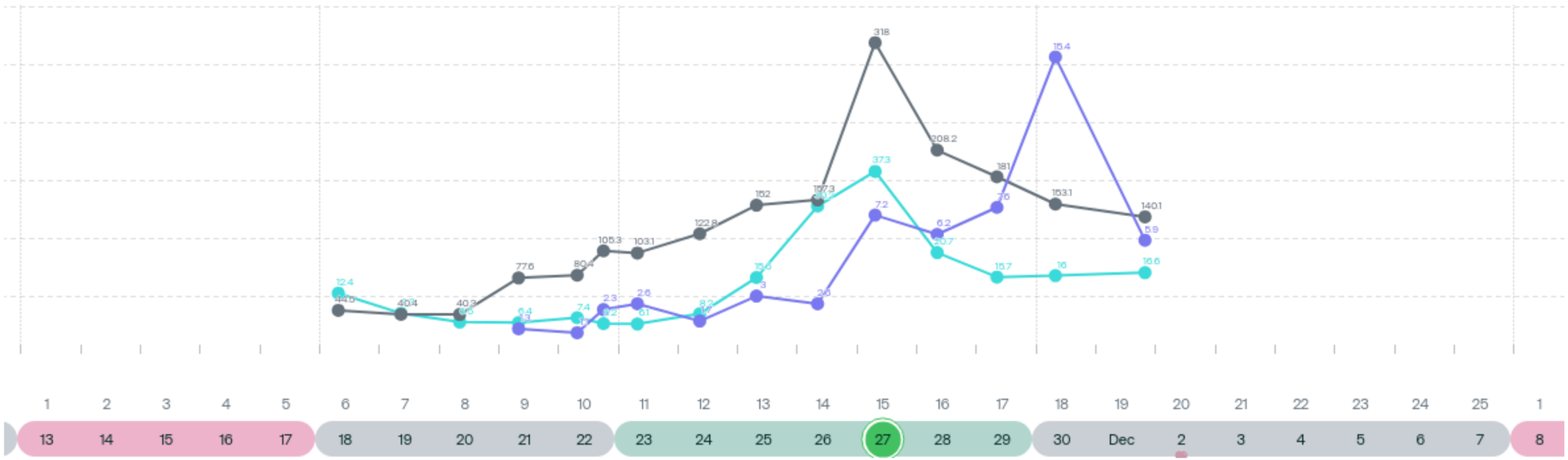
Cycle 2: First 6 breastfeeding cycles



Mira data discovered:

- LH surge on CD 16 and CD 17
- Ovulation confirmed with rising PdG levels
- Luteal phase 11 days

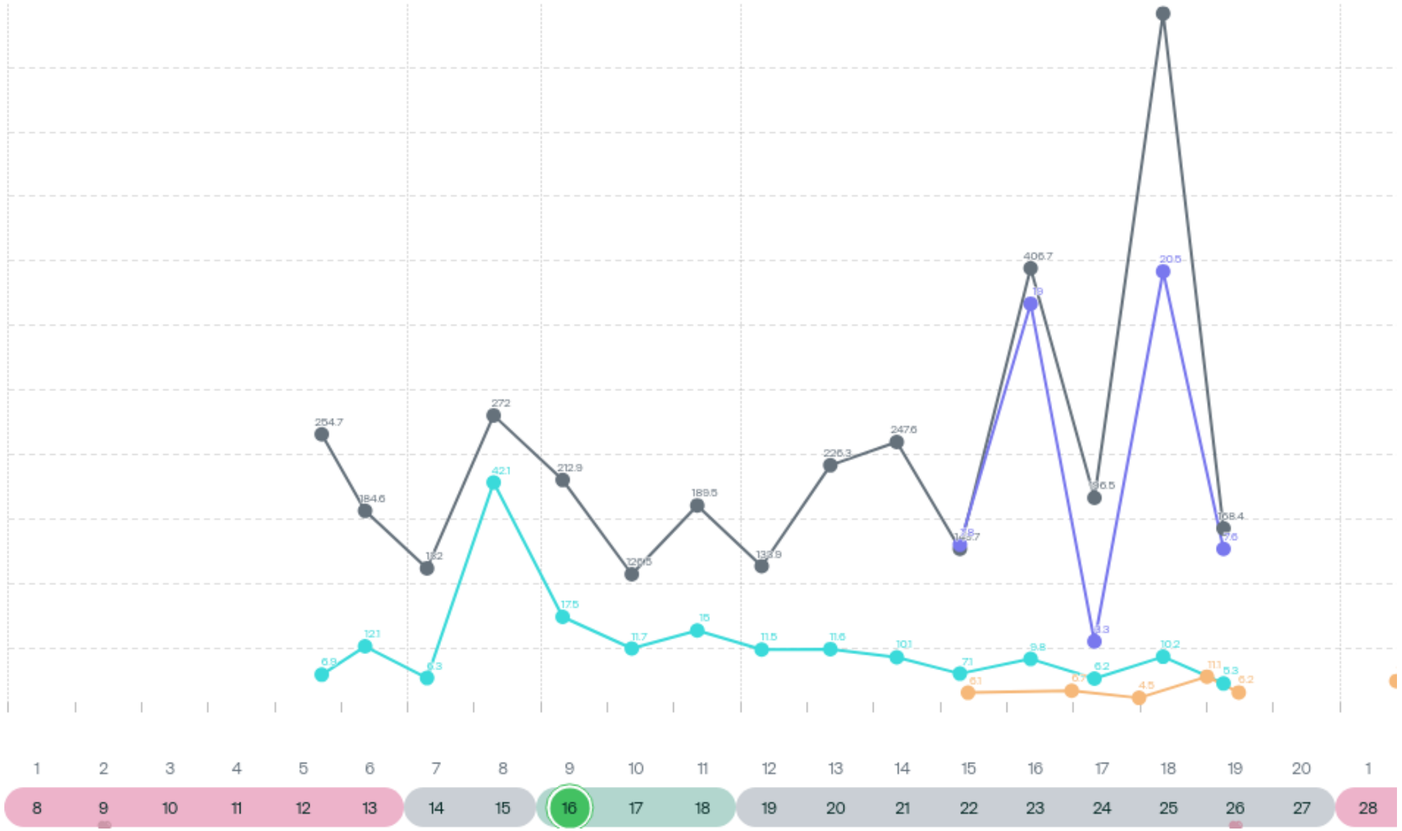
Cycle 3: First 6 breastfeeding cycles



Mira data discovered:

- LH surge on CD 14-CD16
- LH levels did not return to baseline after surge
- Ovulation confirmed with rising PdG levels
- Luteal phase 10 days

Cycle 4: First 6 breastfeeding cycles



Mira data discovered:

- LH surge on CD 8
- Ovulation confirmed with elevated PdG
- Luteal phase 11 days
- Short cycle length

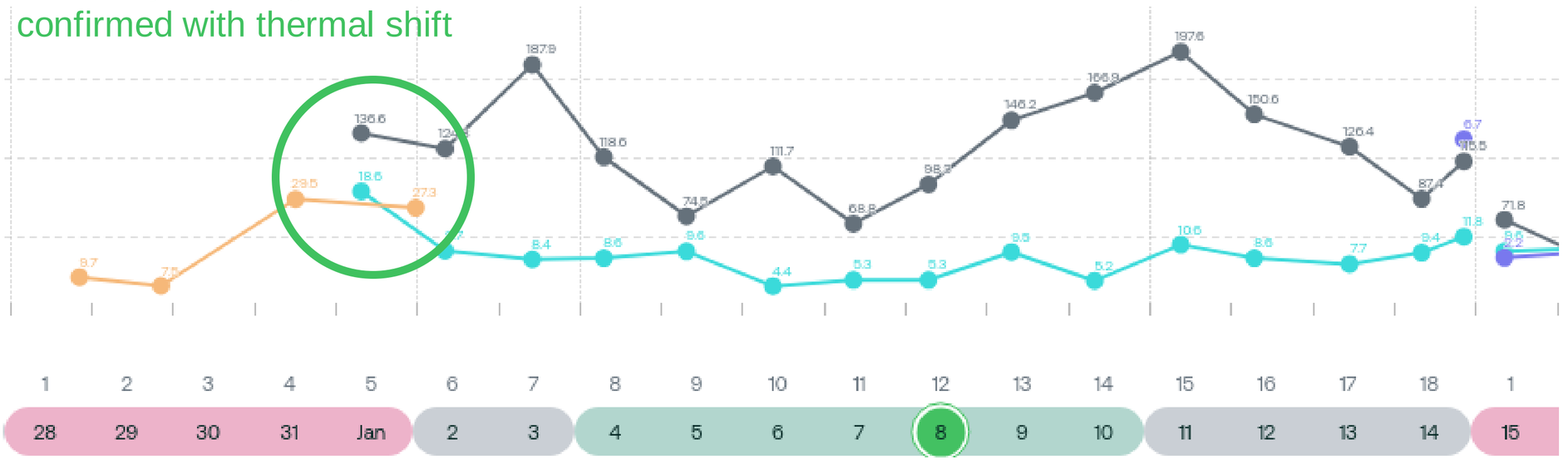
Problems:

- Early LH surge on CD 8
- Short menstrual cycle length

Cycle 5: “Regular Cycle Protocol”

No longer breastfeeding

Ovulatory LH surge
confirmed with thermal shift



Mira data discovered:

- LH surge/FSH surge on CD 5
- Luteal phase 13 days
- Cycle length 18

Problem:

- Early LH surge on CD 5
- Short menstrual cycle length
- Difficult to successfully avoid a pregnancy

Work up with restorative reproductive health provider (FEMM) Jan 2024

Blood work completed on CD 3 (Dec 30th)

Diagnosed with metabolic PCOS and insulin resistance

Findings

Abnormal insulin

Low vitamin D: 10 ng/ml

Abnormal estradiol level: 500 pg/ml on CD 3

No elevated male hormones

Treatment / Interventions

Started on Metformin

Increased protein, diet changes

Started Vitamin D supplement

Ultrasound Result

Impression
1. Bilateral ovarian follicles as above.
2. Small amount of fluid in the C-section site.
3. Endometrium is borderline prominent with trilaminar appearance. Small amount of fluid in the endocervical canal and extending into the C-section site.

EXAMINATION: Transvaginal Ultrasound Pelvis – Follicle Study
EXAM DATE: 1/24/2024 8:15 PM

TECHNIQUE: Transvaginal ultrasound evaluation only to evaluate size and number of follicles and to evaluate endometrial thickness.

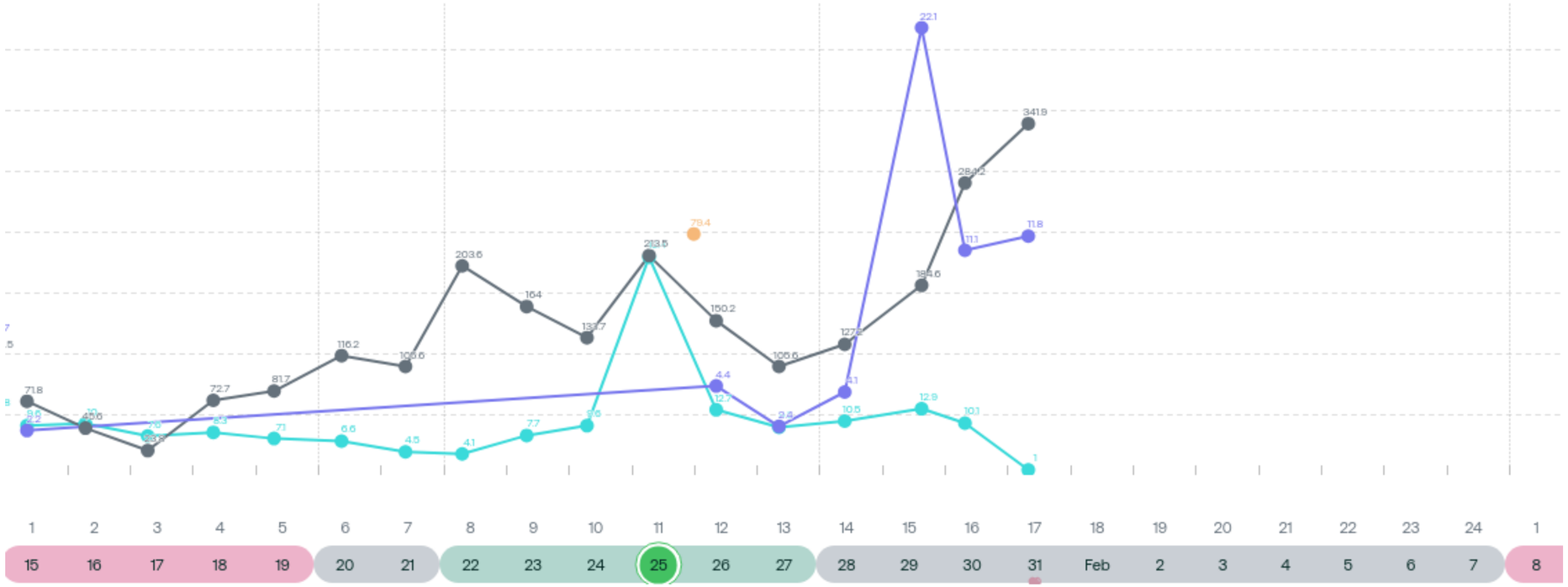
INDICATION: abn level of hormones in spec from other organs systems and tissues
COMPARISON: None

FINDINGS:
1. Uterus Size: The uterus measures 9.6 cm in dimension (length x AP x width).
2. Endometrium: The endometrium measures 14 mm in thickness. The endometrium has a trilaminar appearance.
3. Myometrium: Small amount of fluid extending into the C-section site. Fluid in the endocervical canal.

Right Ovary:
Size: 3.0 x 2.2 x 3.7 cm
All right ovarian follicles are listed below:
–2-dimensional diameter: 11 x 8 mm, mean diameter: 10 mm
–2-dimensional diameter: 24 x 18 mm, mean diameter: 21 mm

Left Ovary:
Size: 2.8 x 1.1 x 1.9 cm
There is one follicle less than 8 mm. Two follicles greater than 8 mm.
–2-dimensional diameter: 9 x 8 mm, mean diameter: Eight mm
–2-dimensional diameter: 10 x 6 mm, mean diameter: Eight mm

Follow-up Mira data

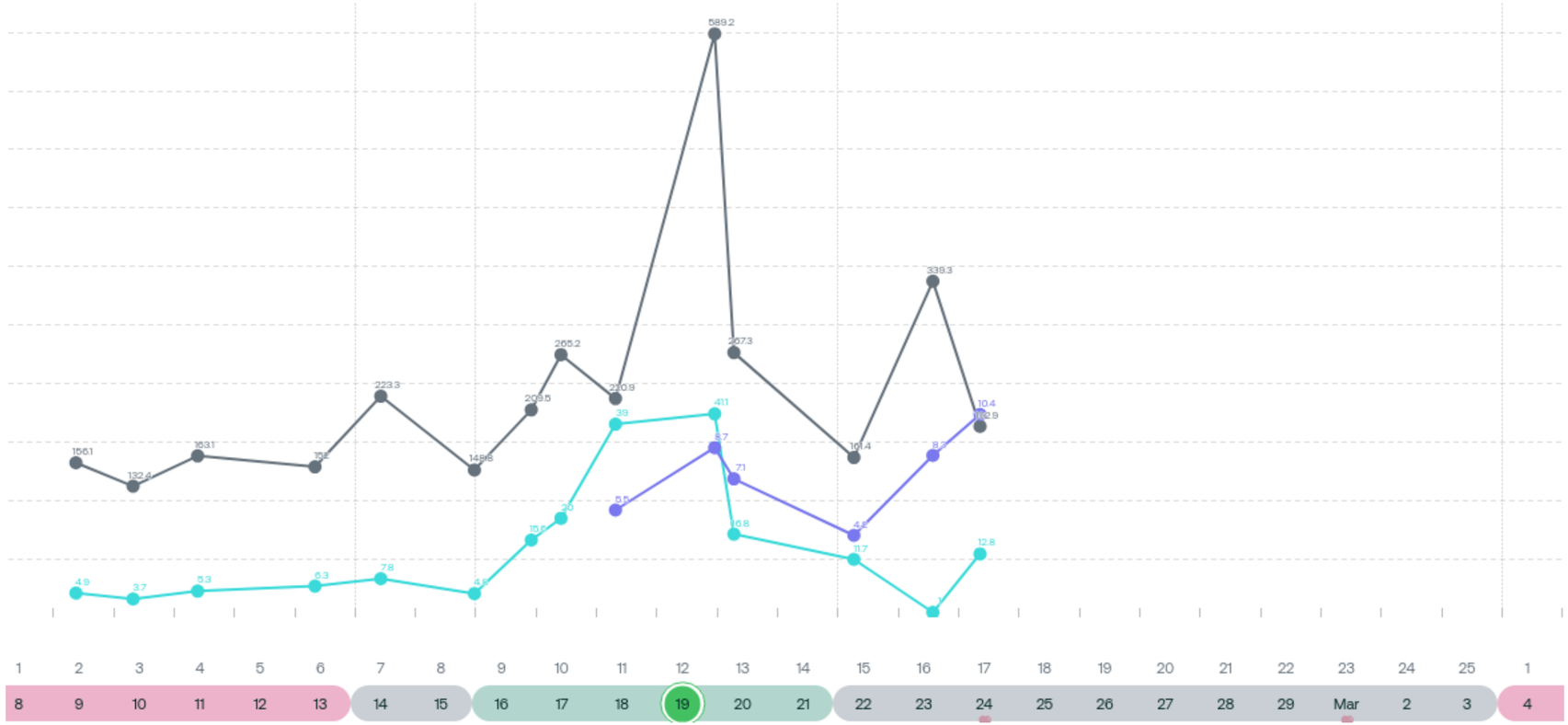


Mira data discovered:

- LH surge on CD 11
- Elevated PdG confirms ovulation
- Cycle length 24 days

The patient responded well to treatment and immediately her hormones began following a better pattern

Follow-up Mira data

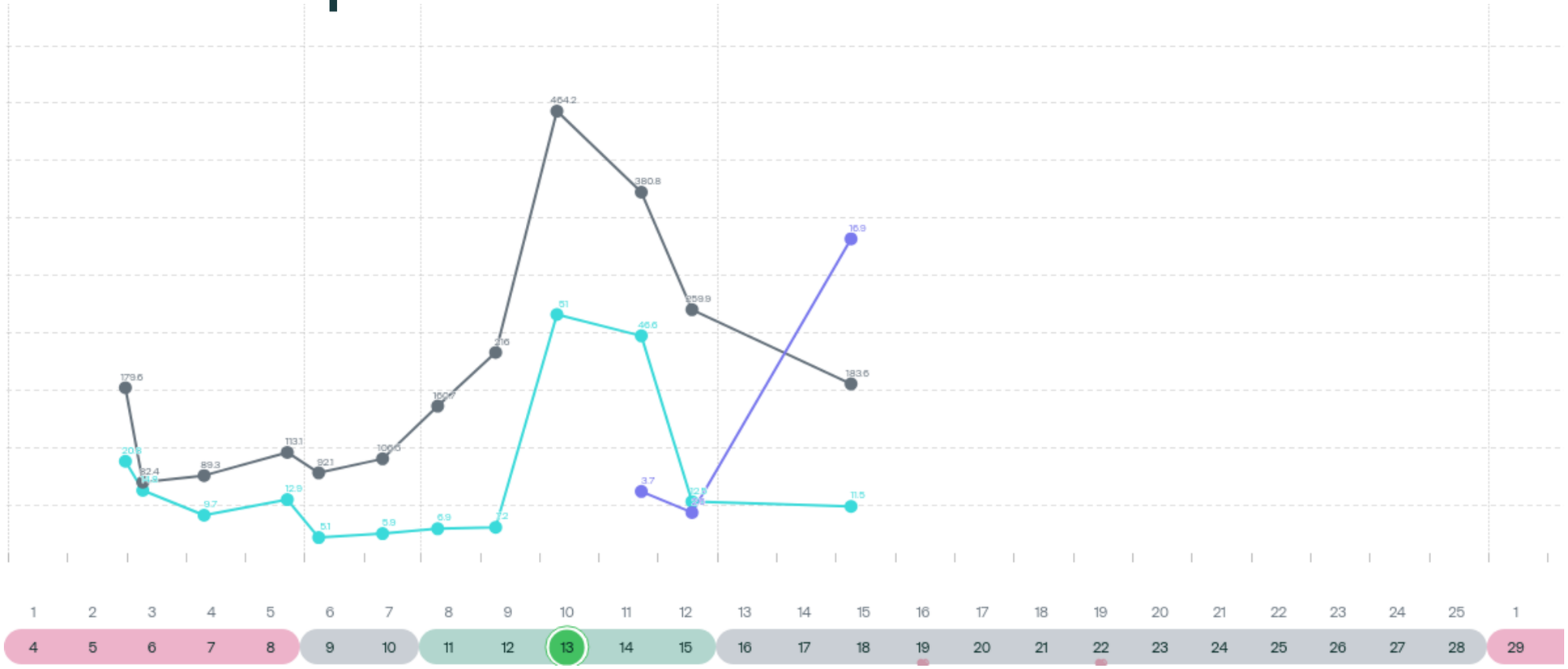


Mira data discovered:

- LH surge on CD 11 and CD 12
- Elevated PdG confirms ovulation
- Cycle length 25 days

Normalized hormone pattern
No longer having abnormally early LH surges
E3G levels are improving during luteal phase

Follow-up Mira data



Mira data discovered:

- LH surge on CD 10 and CD 11
- Elevated PdG confirms ovulation
- Cycle length 25 days

Normalized hormone patterns
Normalized LH surge
Normalized cycle length

Summary

- The Marquette Method of NFP Instructor was able to identify hormone abnormality during postpartum amenorrhea by closely monitoring underlying hormone patterns with Mira
- Mira monitor provided more detailed in-depth measurements that the Clearblue fertility monitor could not provide
- It can be difficult to convince patients to get a thorough workup or a second opinion
- The patient was diagnosed with PCOS and received appropriate treatment
- The patient’s hormone patterns have improved and she is no longer having abnormally early LH surges and short menstrual cycles
- The patient feels confident identifying her fertile window to avoid pregnancy

Case report: Patient #2

Patient background

25 year old female

G2P2; second child born 10/20/2023 at 40 weeks 2 days

Weight: 160 lb

Height: 5 ft 4 in

BMI: 27.5

Reported regular cycles

Medical history

“Gut issues”

No medications, no supplements

Gestational diabetes and hypertension during first pregnancy (neither during second pregnancy)

Patient situation

Prior to marriage, the patient learned Creighton (cervical mucus-based method) but felt overwhelmed with mucus observations

Decided to switch to Marquette Method of NFP - utilizing mucus observations and LH test strips

With the first child, the patient had a traumatic pregnancy and delivery with gestational diabetes, hypertension, failed induction, and a C-section at 38 weeks. After delivery, she resumed the Creighton Method without an instructor; however, she reported the experience to be “stressful”.

Unintentionally, she conceived her second child before her first menstrual cycle when she was 4 months postpartum and breastfeeding.

After the birth of her second child, she decided to work closely with a Marquette Method of NFP Instructor tracking her fertility with the Mira monitor. She wanted to avoid a pregnancy for 2 years after childbirth and reported high motivation, rated at 10/10.

Postpartum Amenorrhea (Cycle 0)

Initial Mira Chart

At 6 weeks postpartum patient reports “period like bleeding” (Nov 29th–Dec 3rd) with 3 days of consistent red bleeding followed by 2 days of brown spotting, and then two days of light spotting on Dec 9th and Dec 10th

Mira data discovered:

- Lack of LH surge prior to bleeding
- Fluctuating E3G levels

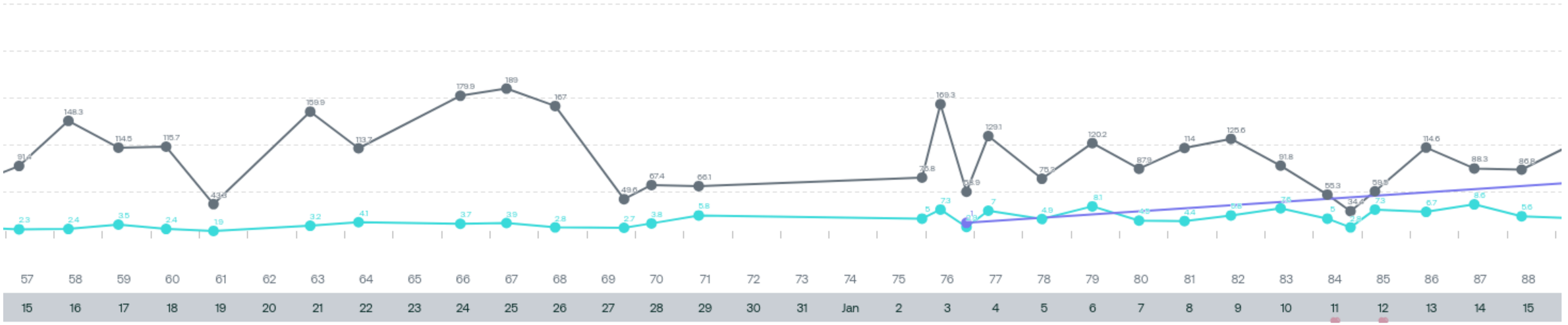
Problem

- Unsure if the bleeding was her first postpartum period
- The patient felt confident that it was a period
- The patient consulted with their OBGYN who did not feel it was her period due to being 6 weeks postpartum and breastfeeding

Plan

- The patient wanted to follow a conservative approach so the NFP instructor moved her to the first 6 breastfeeding cycle 1 instruction assuming the bleeding was a period.
- The patient started the postpartum first 6 breastfeeding cycle 1 instruction and continued testing with Mira fertility plus wands looking for an LH surge (ovulation attempt).

Postpartum Cycle 1 vs Continued Cycle 0 Chart



Mira data discovered:

- Lack of LH surge
- Fluctuating E3G levels
- Lack of coordinated hormones
- No bleeding

Problem

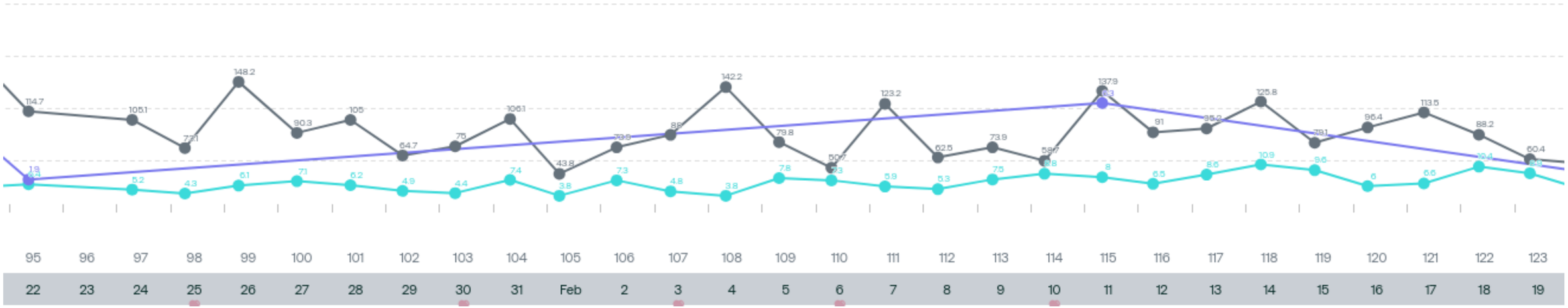
- No LH surge found
- Fluctuating E3G levels
- Continued lack of coordinated hormones
- No further bleeding

Plan

- The instructor and patient reviewed her hormone pattern. They decided to move her back to postpartum amenorrhea (cycle 0) instructions due to her lack of ovulation after an extended period of time.
- Determined previous bleeding pattern was non-menstrual (breakthrough) bleeding.

Returned to Postpartum Amenorrhea

(Cycle 0) Mira Chart



Mira data discovered:

- Fluctuating E3G levels
- Lack of coordinated hormones
- Lack of ovulation

Problem

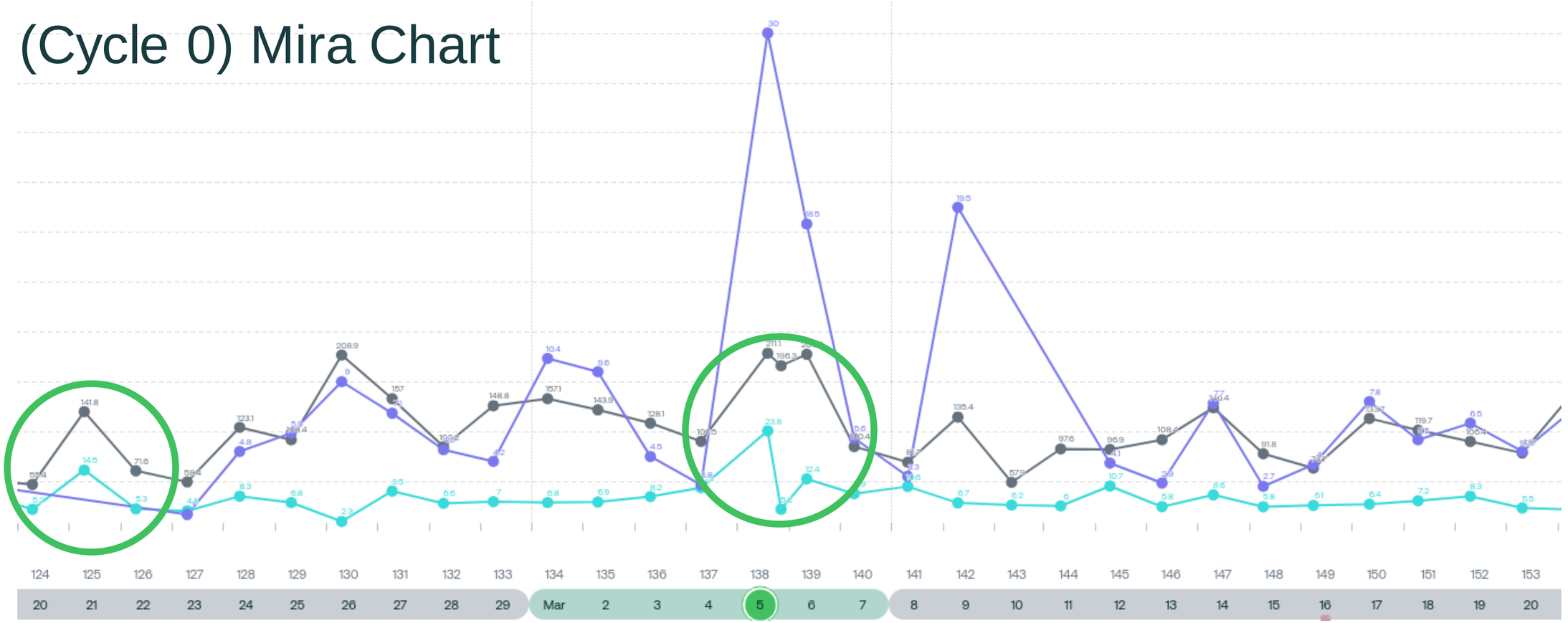
- Fluctuating E3G levels make it difficult to determine an infertile pattern
- The patient did not feel confident that she was in an infertile pattern
- The patient reports “nagging anxiety” and states “I just feel like I’ll never get over that feeling of being “scared” [that] I [will] get pregnant.”

Plan

- The NFP instructor provided reassurance of her ability to find infertile days despite fluctuating E3G levels.
- Recommended close follow-up

Returned to Postpartum Amenorrhea

(Cycle 0) Mira Chart



Mira data discovered:

- Small LH surge (14.5 mIU/ml) on Feb 21
- LH surge (23.8 mIU/ml) on March 5

Determined to be non-ovulatory LH surges due to lack of menstrual period to follow

Problem

- Patient concerned with variable E3G and multiple non-ovulatory LH surges
- Patient struggling to trust that she can find her fertile window effectively to avoid a pregnancy
- The patient fears that she will conceive before her first period as she did in the past

Plan

- NFP Instructor recommended a thorough work with a provider to evaluate for underlying causes due to abnormal LH surges and consistently fluctuating E3G levels
- The patient agreed to complete a workup with her OBGYN
- OBGYN completed blood work and ultrasound

Lab Results 4/01/2024

Date Collected: **04/01/2024**

FSH and LH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
LH [01]	9.9		mIU/mL	
		Adult Female	Range	
		Follicular phase	2.4 - 12.6	
		Ovulation phase	14.0 - 95.6	
		Luteal phase	1.0 - 11.4	
		Postmenopausal	7.7 - 58.5	
FSH [01]	5.6		mIU/mL	
		Adult Female	Range	
		Follicular phase	3.5 - 12.5	
		Ovulation phase	4.7 - 21.5	
		Luteal phase	1.7 - 7.7	
		Postmenopausal	25.8 - 134.8	

Anti-Mullerian Hormone (AMH)

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ **Anti-Mullerian Hormone (AMH)** [02]	**14.0** **High**		ng/mL	

Lab Results Continued 4/01/2024

Date Collected: **04/01/2024**

Thyroxine (T4) Free, Direct

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
T4,Free(Direct) [01]	1.32		ng/dL	0.82-1.77

TSH

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
TSH [01]	0.833		uIU/mL	0.450-4.500

Prolactin

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
▲ **Prolactin** [01]	**65.7 High**		ng/mL	4.8-33.4

Estradiol

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Estradiol [01]	56.3		pg/mL	
		Adult Female	Range	
		Follicular phase	12.5 - 166.0	
		Ovulation phase	85.8 - 498.0	
		Luteal phase	43.8 - 211.0	
		Postmenopausal	<6.0 - 54.7	
		Pregnancy		
		1st trimester	215.0 - >4300.0	
	Roche ECLIA methodology			

Triiodothyronine (T3)

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3) [01]	138		ng/dL	71-180

Triiodothyronine (T3), Free

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Triiodothyronine (T3), Free [01]	3.1		pg/mL	2.0-4.4

Lab Results Continued 4/01/2024

Thyroid Antibodies

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Thyroid Peroxidase (TPO) Ab [03]	14		IU/mL	0-34
Thyroglobulin Antibody [04]	<1.0		IU/mL	0.0-0.9

Thyroglobulin Antibody measured by Beckman Coulter Methodology
It should be noted that the presence of thyroglobulin antibodies may not be pathogenic nor diagnostic, especially at very low levels. The assay manufacturer has found that four percent of individuals without evidence of thyroid disease or autoimmunity will have positive TgAb levels up to 4 IU/mL.

Progesterone

Test	Current Result and Flag	Previous Result and Date	Units	Reference Interval
Progesterone [01]	0.4		ng/mL	
		Follicular phase	0.1 - 0.9	
		Luteal phase	1.8 - 23.9	
		Ovulation phase	0.1 - 12.0	
		Pregnant		
		First trimester	11.0 - 44.3	
		Second trimester	25.4 - 83.3	

Ultrasound Results 4/15/2024

Uterus & Endometrium

Uterine Position	anteverted			
Appearance				
Size (L, W, H)	6.4 cm	5.0 cm	2.8 cm	46.6 cm3
Endometrium	5.3 mm			
Comments				

Adnexa & Cul de Sac

Right Ovary	visualized			
Consistency				
Size (L,W,H,V)	3.0 cm	1.7 cm	1.6 cm	4.3 cm3
Color flow	Present	*Resistivity Index*		
Comments				
Left Ovary	visualized			
Consistency				
Size (L,W,H,V)	3.1 cm	1.8 cm	2.0 cm	5.9 cm3
Color flow	Present	*Resistivity Index*		

Results

- Uterus within normal limits.
- Multiple follicles found in both ovaries consistent with PCOS
- A small amount of free fluid, resolving corpus luteal in left ovary

OBGYN Summary

- Diagnosed with PCOS based on ultrasound result and AMH level
- OBGYN offered oral hormonal birth control, patient declined

Treatment / Interventions / Assistance

NFP Instructor provided PCOS resources and strategies

The patient decided to prioritize

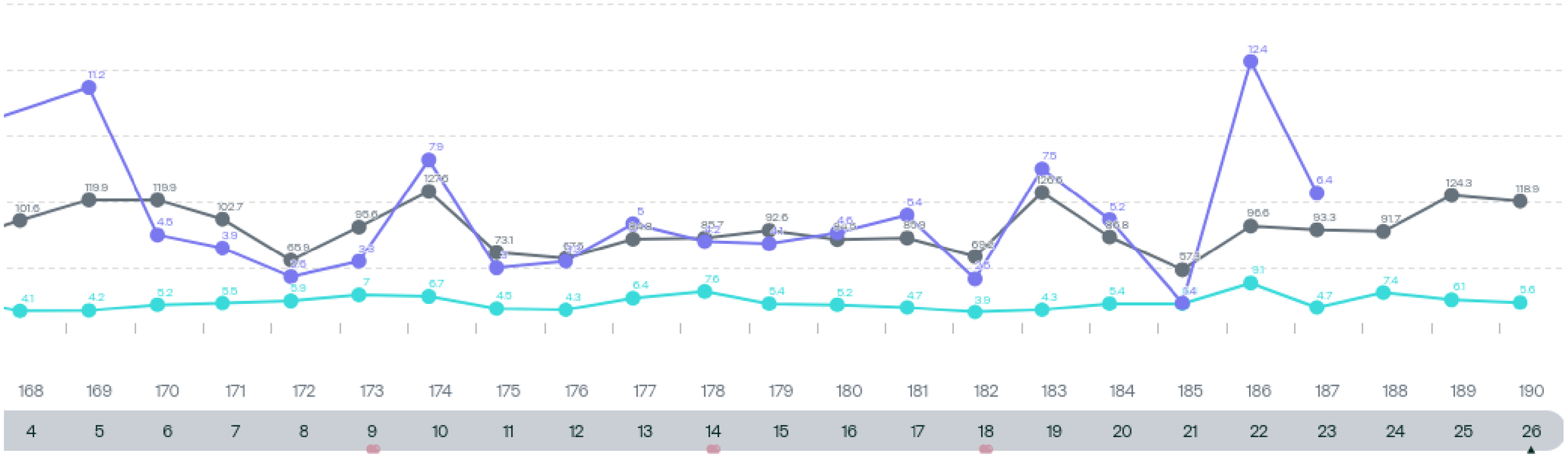
- Limiting sugar intake
- Eliminating processed foods
- Reducing carbohydrate intake

Treatment / Interventions / Assistance

The patient began working with a certified internist/chiropractor who recommended an estrogen cleanse and supplements

- Psyllium husk fiber
- Betaine Plus
- Pepti-Guard
- Hepaticlear
- Vitamin B12
- Iron
- Vitamin E
- Probiotic (Biodophilus powder)
- Liquid chlorophyll

Follow-up Mira chart



Mira data discovered:

- E3G levels- minimally fluctuating and generally low
- Lack of LH surges

Summary

- Patient no longer has non-ovulatory LH surges
- Able to identify infertile pattern

Summary

- The Marquette Method of NFP Instructor was able to identify hormone abnormality during postpartum amenorrhea by closely monitoring underlying hormone patterns with Mira
- The patient was diagnosed with PCOS and received appropriate treatment
- Although the patient was initially shocked with a PCOS diagnosis since she did not have cycle issues prior to her pregnancies and she conceived easily with both pregnancies she was relieved to find the reason for her abnormal hormone pattern
- The patient’s hormone patterns have improved and is no longer having non-ovulatory LH surges and significantly fluctuating E3G levels
- The patient is feeling more confident in her ability to identify her fertile window to avoid pregnancy

Thank you!