

CASE REPORT

Improvement in Hematological and Iron Profile Parameters Following Individualized Ayurvedic Management of Iron Deficiency Anemia: A Case Report

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ABSTRACT

Iron deficiency anemia is a common nutritional disorder among women and is associated with fatigue, reduced functional capacity, and impaired quality of life. Documentation of objectively measured outcomes following Ayurvedic management in routine clinical practice remains limited. This report describes the clinical and laboratory outcomes of a patient with IDA managed in an Ayurvedic outpatient setting. A 35-year-old female presented with generalized weakness, easy fatigability, and occasional giddiness. She was a known case of hypothyroidism receiving Thyroxine 50 µg/day. Clinical examination revealed marked pallor. Hematological investigations demonstrated microcytic hypochromic anemia with depleted iron stores, establishing the diagnosis of IDA. From an Ayurvedic perspective, the condition was diagnosed as Pandu Roga. The patient received individualized Ayurvedic management for more than 6 months, comprising *Lauha Bhasma*, *Amalaki Churna*, *Yashada Bhasma*, *Swarnamakshika Bhasma*, *Drakshasava*, and subsequently *Dhatri Lauha*, along with dietary counseling and lifestyle modifications. The treatment regimen was modified during follow-up according to clinical findings. Serial follow-up demonstrated progressive improvement in hematological and iron profile parameters during follow-up. Hemoglobin improved from 7.7 g/dL to 12.0 g/dL, while serum ferritin increased from 5.03 ng/mL to 30.52 ng/mL. Serum iron improved and unsaturated iron binding capacity decreased, indicating restoration of iron status. Peripheral blood smear findings normalized from a microcytic hypochromic picture with anisopoikilocytosis to a normocytic normochromic blood picture. Clinical symptoms also improved substantially. This case demonstrates favorable clinical and laboratory outcomes following individualized Ayurvedic management of IDA. The findings provide preliminary real-world evidence and support the need for further observational studies and controlled clinical trials evaluating Ayurvedic interventions in IDA.

1. BACKGROUND

Iron deficiency anemia (IDA) is among the most common causes of morbidity worldwide and is frequently encountered in primary care and outpatient practice.^[1] According to global and national estimates, anemia affects a substantial proportion of Indian women and contributes to fatigue, reduced work capacity, impaired quality of life, adverse reproductive outcomes, and significant socioeconomic burden.^[2] Although effective treatment strategies are available,

there remains growing interest in understanding patient outcomes achieved in real-world clinical settings outside controlled research environments. Real-world evidence generated from routine clinical practice can complement data from experimental studies by providing insights into patient presentation, management pathways, treatment adherence, and longitudinal outcomes.

Ayurvedic healthcare institutions in India serve a large number of patients presenting with common chronic and nutritional disorders. However, documentation of objectively measured clinical outcomes, particularly serial hematological and biochemical parameters, remains limited in the published literature. Most available reports focus on symptom relief, while fewer studies describe longitudinal changes in

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laboratory markers, such as hemoglobin concentration, serum ferritin, iron profile, and peripheral blood morphology.

The integration of modern diagnostic evaluation with individualized Ayurvedic management offers an opportunity to document clinically relevant outcomes in routine practice. Such observations can contribute to hypothesis generation and inform the design of future observational and interventional studies.

This report presents a real-world case of IDA identified during routine evaluation of a woman attending an Ayurvedic outpatient department. The case highlights the diagnostic pathway, management approach, and serial changes in hematological and iron profile parameters observed during follow-up.

2. PATIENT INFORMATION

A 35-year-old woman presented to the Kayachikitsa outpatient department at the National Institute of Ayurveda with complaints of generalized weakness, easy fatigability, and occasional giddiness for several weeks. The symptoms were gradual in onset and progressively interfered with her daily routine.

She was a known case of hypothyroidism and had been receiving Thyroxine 50 µg/day regularly. She was not taking any other medications, including oral iron supplements, injectable iron therapy, vitamin-mineral preparations, or other hematonic agents, at the time of presentation or during the follow-up period.

There was no significant family history of hematological disorders, chronic systemic illness, bleeding disorders, or inherited blood diseases. She adhered to a vegetarian diet and reported no history of gastrointestinal illness, chronic blood loss, previous blood transfusion, or any major medical or surgical illness.

2.1. Clinical Findings

On general physical examination, marked pallor was observed. Vital parameters were within normal limits. Systemic examination of the cardiovascular, respiratory, abdominal, and nervous systems did not reveal any significant abnormality.

From an Ayurvedic perspective, the clinical presentation was suggestive of *Pandu Roga* (Anemia disorder). The patient's history revealed dietary practices, such as *Adhyashana* (consumption of food before complete digestion of the previous meal) and *Ajirhashana* (eating in a state of incomplete digestion), which are described as dietary indiscretions that impair *Agni* (metabolic factors) and predispose to disease.^[3] The associated hypothyroid condition was interpreted as indicative of *Dhatvagnimandya* (diminution of digestive power located in tissues).

In view of the presenting complaints and clinical findings, further laboratory investigations were undertaken for diagnostic evaluation.

2.2. Diagnostic Assessment

Considering the presenting complaints and clinical findings, hematological, iron profile, peripheral blood smear, and thyroid function investigations were performed. The baseline and follow-up findings are presented in Tables 1 and 2. Based on the overall clinical and laboratory assessment, a diagnosis of IDA was established. From an Ayurvedic perspective, the condition was diagnosed as *Pandu Roga* (Anemia disorder).

2.3. Timeline

The chronological timeline of the patient's clinical course is presented in Table 3.

2.4. Therapeutic Interventions

The patient received Ayurvedic management comprising herbo-mineral formulations along with dietary and lifestyle modifications. Dietary counseling included regular consumption of green leafy vegetables, seasonal fruits, and a balanced diet, along with avoidance of tea immediately after meals to facilitate iron absorption. Lifestyle advice included maintaining regular meal timings and avoiding dietary practices, such as *Ajirhashana* and *Adhyashana*. The therapeutic interventions were modified during follow-up based on the patient's clinical status and laboratory findings mentioned in table 3. Details of the interventions are presented in Table 4.

2.5. Follow-up and Outcomes

The patient was reviewed periodically with clinical assessment and serial laboratory investigations. Progressive improvement in generalized weakness, easy fatigability, and giddiness was observed during follow-up. Hematological, biochemical, and morphological assessments demonstrated progressive improvement in hemoglobin concentration, iron profile parameters, and peripheral blood morphology.

The treatment regimen was modified according to the patient's evolving clinical status and laboratory findings. During follow-up, the patient reported per-vaginal discharge that had not been disclosed during the initial consultation; accordingly, *Pradarantaka Lauha* and *Drakshasava* were introduced as part of the individualized treatment plan. Following improvement in the per-vaginal discharge, *Pradarantaka Lauha* was discontinued. As hematological parameters and iron stores improved, *Lauha Bhasma* was discontinued and *Dhatri Lauha* was initiated as a maintenance formulation. The combination of *Amalaki Churna*, *Yashada Bhasma*, and *Swarnamakshika Bhasma* was continued throughout the treatment period. No adverse events or treatment-related complications were reported during follow-up.

3. DISCUSSION

The present case describes the management of IDA in a routine Ayurvedic clinical setting and documents favorable clinical, hematological, biochemical, and morphological outcomes during serial follow-up.

From an Ayurvedic perspective, the clinical presentation was consistent with *Pandu Roga* (anemia disorder), characterized by *Panduta* (pallor), *Daurbalya* (weakness), *Shrama* (physical exhaustion disorder), and *Nisarta* (weak tissues).^[4] Classical Ayurvedic texts describe *Agnimandya* (diminution of *Agni*) as a central factor in the pathogenesis of *Pandu Roga*. Impairment of *Jatharagni* (metabolic factors located in the digestive tract) and subsequent *Dhatvagni* (metabolic factors located in dhatu) may result in inadequate formation and nourishment of *Rasa Dhatu* (primary product of digested food) and *Rakta Dhatu* (blood tissue), ultimately manifesting as *Pandu Roga* (anemia disorder).^[5]

An additional aspect warranting consideration in the present case was the coexistence of hypothyroidism. The patient continued Thyroxine 50 µg/day throughout the observation period. Contemporary evidence suggests a bidirectional relationship

between thyroid dysfunction and iron deficiency, often referred to as the iron–thyroid axis, in which impaired thyroid function may adversely influence erythropoiesis and iron metabolism, while iron deficiency may further compromise thyroid hormone synthesis through reduced activity of iron-dependent enzymes.^[6,7] From an Ayurvedic perspective, this relationship may be interpreted through the concept of *Dhatvagnimandya* (diminution of Agni at tissue-level), which provides a conceptual framework for understanding how impaired tissue metabolism may influence tissue nourishment and *Rakta Dhatu* (blood tissue) formation.^[6,8] Although thyroid function demonstrated partial improvement during follow-up, complete normalization was not consistently achieved. Therefore, while improved thyroid status may have contributed to overall clinical well-being, it is unlikely to fully explain the hematological recovery and restoration of iron status observed in this patient.

Accordingly, the therapeutic objective was not merely correction of laboratory abnormalities but restoration of physiological balance through correction of *Agni*, improvement of *Dhatu Poshana* (tissue nourishment), and support of *Rakta Dhatu* formation. The therapeutic strategy incorporated *Lauha*-containing formulations indicated in *Pandu Roga* along with *Rasayana* (rejuvenation and revitalization therapy) interventions. The selection and sequential modification of *Lauha*-containing formulations were guided by periodic clinical reassessment together with serial hematological and biochemical evaluation, reflecting a phased, patient-specific approach rather than a fixed treatment protocol. *Amalaki* (*Emblica officinalis*) was included because of its *Rasayana* properties and reported role in facilitating iron utilization,^[9] while *Yashada Bhasma* and *Swarnamakshika Bhasma* were administered as supportive formulations with potential roles in hematopoietic processes.^[10] Unlike conventional oral iron preparations, in which elemental iron content is standardized, the therapeutic intervention in the present case cannot be directly translated into an equivalent elemental iron dose. Processed *Lauha Bhasma* has been shown to contain iron predominantly in oxide forms within complex herbo-mineral matrices, and the overall iron content of compound Ayurvedic formulations varies according to their composition and manufacturing process.^[11,12] Therefore, these formulations were prescribed according to classical dosage recommendations rather than a calculated elemental iron content. This phased modification of therapy reflects an important principle of Ayurvedic clinical practice, wherein treatment is individualized and periodically reassessed according to changes in the patient's clinical presentation and objective laboratory findings.

Another important observation was the improvement in multiple hematological and iron status indicators during follow-up. Beyond correction of anemia, improvement in serum ferritin suggested replenishment of depleted iron stores,^[13] while changes in serum iron and unsaturated iron-binding capacity (UIBC) were consistent with restoration of iron homeostasis.^[7] Peripheral blood smear examination demonstrated progressive improvement in red cell morphology during follow-up, with resolution of anisopoikilocytosis and a reported normocytic normochromic blood picture. Although mean corpuscular volume and mean corpuscular hemoglobin remained below the reference range at the final follow-up, the overall hematological profile suggested recovery from the underlying iron deficiency state. The persistence of reduced red cell indices despite morphological improvement may reflect delayed normalization of erythrocyte indices or another coexisting hematological condition. However, further investigations in this regard were not performed in the present case.

A major strength of the present report is the documentation of serial objective outcome measures over an extended follow-up period. Nevertheless, the limitations inherent to a single-case observation remain. The contribution of dietary modifications, treatment adherence, and other unmeasured factors cannot be excluded, and a causal relationship between the intervention and observed outcomes cannot be established.

3.1. Practice Implications

This case highlights the importance of appropriate hematological evaluation in patients presenting with common symptoms, such as weakness and easy fatigability. Serial monitoring of hematological and iron profile parameters, alongside Ayurvedic clinical assessment, can facilitate individualized treatment modifications and objective evaluation of therapeutic outcomes. Systematic documentation of such real-world clinical outcomes may contribute to strengthening the evidence base for the Ayurvedic management of *Pandu Roga* and IDA.

4. CONCLUSION

This case demonstrates positive clinical and hematological outcomes in a patient with IDA managed through an individualized Ayurvedic treatment approach. Improvement was observed not only in hemoglobin concentration but also in iron profile parameters and peripheral blood morphology, suggesting recovery of the underlying iron deficiency state. The case further highlights the importance of systematic clinical evaluation and objective laboratory monitoring in routine Ayurvedic practice. While the findings from a single case cannot establish causality, they provide preliminary real-world evidence supporting the potential role of Ayurvedic interventions in the management of IDA. Further well-designed observational studies and controlled clinical trials are warranted to validate these findings.

4.1. Patient Perspective

The patient reported marked improvement in her symptoms and overall well-being during the course of treatment. She expressed satisfaction with the management received and reported that the improvement in her symptoms enabled her to resume routine daily activities with a better quality of life.

4.2. Informed Consent

Written informed consent was obtained from the patient for publication of this case report and the accompanying clinical data. Every effort has been made to protect the patient's identity, and no personally identifiable information has been disclosed.

5. ACKNOWLEDGMENTS

Nil.

6. AUTHORS' CONTRIBUTIONS

Abhishek Upadhyay: Patient management, manuscript editing and revision, referencing, and final approval. Sakshi Chahar: Collected and organized the data, first draft preparation, and referencing. Praween Sawant: Manuscript editing. All authors reviewed and approved the final manuscript.

7. FUNDING

Nil.

8. ETHICAL STATEMENT

Ethical approval was not required for this study as it is a case report.

9. CONFLICT OF INTERESTS

The authors declare no conflicts of interest regarding the publication of this paper.

10. DATA AVAILABILITY STATEMENT

All relevant clinical data supporting the findings of this case report are provided within the article and its supplementary material. Patient-identifying information has been removed to maintain confidentiality.

11. DISCLAIMER/VIEW AND OPINIONS

The opinions expressed in this article are solely those of the authors and do not reflect the views of the International Research Journal of Ayurveda and Yoga or its editorial board.

12. AI-USE DECLARATION

ChatGPT (OpenAI, GPT-5.5) was used to improve the language and clarity of the manuscript. All clinical information, interpretation of findings, references, and conclusions were independently verified by the authors, who assume full responsibility for the final content.

13. PUBLISHER'S NOTE

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Table 1: Changes in hematological and iron profile parameters during follow-up

Parameter	Reference range	Baseline (January 2025)	Follow-up 1 (March 2025)	Follow-up 2 (July 2025)
RBC count (million/ μ L)	3.8–4.8	4.67	4.80	5.84
Hemoglobin (g/dL)	12–15	7.70	10.10	12.00
Hematocrit (%)	36–46	27.50	35.10	39.30
Mean corpuscular volume (fL)	83–101	58.90	67.90	67.30
Mean corpuscular hemoglobin (pg)	27–32	16.65	19.50	20.50
Serum iron (μ g/dL)	33–193	22.93	51.99	75.70
Ferritin (ng/mL)	13–150	5.03	23.69	30.52
UIBC (μ g/dL)	135–392	487.30	334.30	311.40
Vitamin B12 (pg/mL)	180–914	234.90	—	—
Peripheral blood film	Qualitative	Microcytic hypochromic RBCs with moderate anisopoikilocytosis	Microcytic hypochromic picture with mild anisopoikilocytosis	Normocytic normochromic blood picture

Table 2: Changes in thyroid function parameters during follow-up

Parameters	Reference range	13 January 2025	17 March 2025	24 July 2025
T3 (ng/mL)	0.8–2.0	1.33	—	—
T4 (μ g/dL)	5.1–14.1	4.84	—	—
TSH (μ IU/mL)	0.270–4.20	8.85	3.31	5.91

Note: Values outside the laboratory reference range are shown in bold. TCH: Thyroid stimulating hormone

Table 3: Timeline of clinical events

Date	Clinical event
January 2025	Presented with generalized weakness, easy fatigability, and giddiness
11 January 2025	Baseline hematological, iron profile, peripheral smear, and thyroid investigations performed
13 January 2025	Diagnosed with iron deficiency anemia (Pandu Roga), initiated <i>Amalaki Churna+Yashada Bhasma+Swarnamakshika Bhasma+Lauha Bhasma</i>
03 February 2025	Treatment modified: <i>Drakshasava</i> and <i>Pradarantaka Lauha</i> added following history of per-vaginal discharge
17 March 2025	First follow-up: Clinical and laboratory improvement; <i>Lauha Bhasma</i> and <i>Pradarantaka Lauha</i> discontinued following improvement in clinical and laboratory parameters
21 April 2025	<i>Dhatri Lauha</i> initiated as maintenance formulation; <i>Drakshasava</i> discontinued
24 July 2025	Final follow-up: Continued improvement in hematological and iron profile parameters

Table 4: Therapeutic interventions administered during the treatment period

Intervention	Period	Dose	Anupana
Combination of <i>Amalaki Churna+Yashada Bhasma+Swarnamakshika Bhasma</i>	13 January–24 July 2025	3 g+125 mg+60 mg twice a day	Honey
<i>Lauha Bhasma</i>	13 January–17 March 2025	250 mg twice a day	Honey
<i>Drakshasava</i>	03 February–21 April 2025	20 mL twice a day	Water
<i>Pradrantak Lauha</i>	03 February–17 March 2025	500 mg twice a day	Water
<i>Dhatri Lauha</i>	21 April–24 July 2025	500 mg twice a day	Water



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Answer Sheet Code, Exam Date, Register Number



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Register No. [REDACTED]	SS Year of [REDACTED]	Order Date [REDACTED]	13.01.2023 13:30 PM	Sample Collection at [REDACTED]	13.01.2023 13:30 PM
Roll No. [REDACTED]	Order Ref [REDACTED]	Order Ref [REDACTED]	13.01.2023 13:30 PM	Sample Received Date & Time [REDACTED]	13.01.2023 13:30 PM
Patient Address [REDACTED]		Dr. Atanand Kishorey (Dr. Atanand Kishorey, New Delhi)		Authentication Date & Time [REDACTED]	13.01.2023 13:30 PM





Sample Type: Serum

Test	Method	Result	Unit	Ref. Interval
Tarmin	Electrocardiogram	5.63	agent	13-256

Instrument: Cobas e 411

Ref. ref. Interval

Interpretation:

Normal. Acidic and chronic liver disease, Alcoholism, malignancies, Infective and Inflammatory, Hypertension, Diabetes, liver deficiency, Hemodialysis

[Signature]

Dr. Suresh Gupta
Pathologist (MBBS, MD)

Note - Results are subject to normal fluctuations. Please consider critically. This report is not valid for medico-legal purposes.



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		Central Laboratory केन्द्रीय प्रयोगशाला NATIONAL INSTITUTE OF AYURVEDA (Formerly Dept. Of Ayurveda, Yashwantrao Chavan Pratishthan Building) Banswari Vengla Road, Ashok Road, Rajpur-110086			
Applicant: Ref: Patient Address: (Printed/Handwritten Name Only)	Sl. No. of: Order Date: Recd. By:	LAB/2023/123/045 Dr. Ashwini Vaidya Resident Physician - General	Sample Collection at: (Name of Hospital/Date & Time) (Date & Time) (Signature)		
					
Sample Type: EDTA Whole Blood					
Peripheral Blood Smear					
METHOD- MICROSCOPIC [LEISHMAN STAINING] BAC - Smear micrograph, hepatocellular carcinoma, urinary metastatic deposit of atypical epithelial cells. No bacilli seen. No tubercle bacilli seen. No tubercle bacilli seen.					
WBC: WBC count normal (4000-10000/cmm). WBC count normal (4000-10000/cmm). WBC count normal (4000-10000/cmm). WBC count normal (4000-10000/cmm). WBC count normal (4000-10000/cmm).					
Interpretation: Micrograph, hepatocellular carcinoma (100x magnification, photomicrograph)					
(Date: 11/11/2023, Time: 10:00 AM)					
					
					
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Central Laboratory

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General Hospital, New Hospital Building

NATIONAL INSTITUTE OF AYURVEDA

(Channel 17) New Hospital Building

Jawahar Road, Aravalli Road, Mayapuri



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Sl. No. /

Ref. Address

City/State/Zip Code

Order Date

Order Id

Ref. No.

Sample Collection at

Sample Receiver Date & Time

Authorized Date & Time

13/03/2025 12:34 PM

13/03/2025 12:34 PM

13/03/2025 12:34 PM

Instrument: Sysmex P-100

Sample Type: EDTA White Blood

Complete Blood Count

Method	Result	Unit	Ref. interval
WBC	8.19	$\times 10^9 / L$	4.0 - 11.0
Hb	14.0	g/dL	12.0 - 16.0
Hct	42.3	%	37.0 - 47.0
MCV	17.5	fL	83.0 - 101.0
MCH	17.2	pg	27.0 - 32.0
MCHC	98.5	g/dL	31.5 - 34.5
RDW-CV	54.8	%	11.4 - 14.0
RDW-SD	26.6	fL	11.0 - 14.0
WBC - Total	6.68	$\times 10^9 / L$	4.0 - 12.0

WBC - Total

Differential Leucocyte Count

Neutrophils	F.F.C. / Microscopy	62.3	%	42.00
Lymphocytes	F.F.C. / Microscopy	29.3	%	20.00
Eosinophils	F.F.C. / Microscopy	2.9	%	1.00
Monocytes	F.F.C. / Microscopy	8.8	%	1.00
Basophils	F.F.C. / Microscopy	0.8	%	0.1

Absolute Neutrophils Count

Calculated	1.45	$\times 10^9 / L$	0.6 - 7.8
Counted	1.4	$\times 10^9 / L$	0.6 - 7.8

Absolute Lymphocytes Count

Calculated	1.4	$\times 10^9 / L$	0.2 - 1.8
Counted	0.56	$\times 10^9 / L$	0.2 - 1.8

Absolute Eosinophils Count

Calculated	0.15	$\times 10^9 / L$	0.0 - 0.5
Counted	0.15	$\times 10^9 / L$	0.0 - 0.5

Absolute Monocytes Count

Calculated	0.59	$\times 10^9 / L$	0.0 - 1.0
Counted	0.59	$\times 10^9 / L$	0.0 - 1.0

Absolute Basophils Count

Calculated	0.07	$\times 10^9 / L$	0.0 - 0.2
Counted	0.07	$\times 10^9 / L$	0.0 - 0.2

Interpretation /

Remarks /

The Counted cell numbers state that the disease state is the preferred reporting method for the WBC differential. CMC Hematology and C.L.S. Pathology Laboratory, New Hospital Building.

Comments: (WBC) Leukocytosis Focusing Impaired. (Hb) Sideric Leukemia. (RDW-CV) Pathologic Distribution. (RDW-SD) Pathologic Distribution.

Dr. Soma Gupta
Pathologist (MBBS/MD)



BMA



NIA

Note: Results are subject to normal fluctuations. Please correlate clinically. This report is not valid for medical legal purposes.

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The image displays ten Central Laboratory report forms from the National Institute of Ayurveda. The reports are organized into a grid, showing various medical tests and their results. Each report includes patient information, test details, and a signature.

Report 1 (Top Left): Peripheral Blood Smear. Test: Peripheral Blood Smear. Result: Normal. Interpretation: No significant abnormalities observed.

Report 2 (Top Middle): IRON & IBC. Test: IRON & IBC. Result: Iron: 150 µg/dL, IBC: 100 µg/dL. Interpretation: Iron levels are within normal range.

Report 3 (Top Right): CBC. Test: CBC. Result: Hemoglobin: 12.0 g/dL, Hematocrit: 36.0%, RBC: 4.5 million/mm³. Interpretation: Hemoglobin levels are within normal range.

Report 4 (Middle Left): TSH. Test: TSH. Result: 0.02 µIU/mL. Interpretation: TSH levels are within normal range.

Report 5 (Middle Middle): CBC. Test: CBC. Result: Hemoglobin: 12.0 g/dL, Hematocrit: 36.0%, RBC: 4.5 million/mm³. Interpretation: Hemoglobin levels are within normal range.

Report 6 (Middle Right): Peripheral Blood Smear. Test: Peripheral Blood Smear. Result: Normal. Interpretation: No significant abnormalities observed.

Report 7 (Bottom Left): TSH. Test: TSH. Result: 0.02 µIU/mL. Interpretation: TSH levels are within normal range.

Report 8 (Bottom Middle): TSH. Test: TSH. Result: 0.02 µIU/mL. Interpretation: TSH levels are within normal range.

Report 9 (Bottom Right): TSH. Test: TSH. Result: 0.02 µIU/mL. Interpretation: TSH levels are within normal range.

Report 10 (Bottom Center): TSH. Test: TSH. Result: 0.02 µIU/mL. Interpretation: TSH levels are within normal range.