

IMPROVEMENT IN ENDOMETRIAL VASCULARITY AND FOLLICULAR DEVELOPMENT FOLLOWING AN AYURVEDIC FERTILITY INTERVENTION: A CARE-COMPLIANT CASE REPORT

*¹Dr. Sachin Ramkrishna Patil, ²Dr. Rohit Madhav Sane, ³Dr. Amruta Patil

¹Medical Head Rebornn Women Care.

²MD Rebornn Women Care.

³Clinic Head Rebornn women Care Clinic.

Article Received on 09 Sept. 2026,
Article Revised on 29 Sept. 2026,
Article Published on 01 October 2026

<https://doi.org/10.5281/zenodo.23115772>

*Corresponding Author

Dr. Sachin Ramkrishna Patil

Medical Head Rebornn Women Care.



How to cite this Article: *¹Dr. Sachin Ramkrishna Patil, ²Dr. Rohit Madhav Sane, ³Dr. Amruta Patil. (2026). Improvement In Endometrial Vascularity And Follicular Development Following An Ayurvedic Fertility Intervention: A Care-Compliant Case Report. World Journal of Pharmaceutical Research, 15(19), 767-778.

This work is licensed under Creative Commons Attribution 4.0 International license.

ABSTRACT

Introduction: Endometrial receptivity is a multifactorial determinant of implantation. Ultrasound assessment of endometrial thickness, morphology and vascularity is widely used in fertility practice, although the predictive value of individual ultrasound markers remains uncertain. This case is notable for a change in reported Zone III endometrial vascularity and Applebaum uterine score between two monitored cycles following an Ayurvedic fertility intervention.

Case presentation: A woman in her mid-30s undergoing infertility care underwent serial follicular monitoring before and after a reported one-month course of Fertility Detox Treatment under the SAFE Axis Therapy Protocol. In the pre-intervention monitored cycle, the Applebaum score was 7 and Zone III vascularity was reported as absent. The dominant follicle reached 14 × 10 mm and subsequently ruptured on

cycle day 14; endometrial thickness at rupture was 7.2 mm. In the subsequent monitored cycle, the Applebaum score was 12 and Zone III vascularity was reported as present. The dominant follicle enlarged from 14 × 12 mm on cycle day 10 to 21 × 18 mm on cycle day 16, with endometrial thickness increasing from 6.2 to 7.7 mm. Follicular rupture was documented on cycle day 19 with an endometrial thickness of 7.8 mm and minimal free fluid in the pouch of Douglas. **Conclusion:** This case documents an observable cycle-to-cycle change in ultrasound markers of uterine and follicular status temporally associated with an Ayurvedic

fertility intervention. The findings are hypothesis-generating and do not establish causality, improved implantation, or pregnancy. Standardized prospective studies with reproducible Doppler methodology and patient-important reproductive outcomes are warranted.

KEYWORDS: infertility; endometrial receptivity; Zone III vascularity; Applebaum uterine score; follicular monitoring; Ayurveda; case report.

1. INTRODUCTION

Infertility is a disease of the reproductive system characterized by failure to achieve pregnancy after a defined period of regular unprotected intercourse. Its causes may be female, male, combined, or unexplained.

Contemporary infertility assessment therefore considers ovulation, ovarian reserve, uterine and tubal factors, and male reproductive factors rather than attributing infertility to a single mechanism.^[1,2]

Implantation is a complex biological process requiring coordination between embryo competence and a receptive endometrium. Ultrasonography provides a non-invasive means of evaluating the uterus and ovaries during fertility treatment. Endometrial thickness and pattern, as well as uterine and endometrial/subendometrial vascularity, have been investigated as potential markers of receptivity. The Applebaum uterine scoring concept incorporates several sonographic and Doppler features, including endometrial thickness, morphology, blood flow and uterine artery parameters.^[3-6]

The present case is clinically interesting because the same patient had two serially monitored cycles with a documented change in Applebaum score from 7 to 12 and a change in reported Zone III vascularity from absent to present after a reported one-month Ayurvedic fertility intervention. The case also provides an opportunity to illustrate how serial follicular development and endometrial measurements can be documented in a CARE-compliant case report.^[8,9]

2. FOCUSED LITERATURE REVIEW

2.1 Endometrial receptivity and ultrasound assessment

The endometrium undergoes marked structural and vascular changes across the menstrual cycle. Reviews of three-dimensional ultrasound and Doppler techniques have described cyclical changes in endometrial vascularization and have examined the potential relationship

between vascularity and implantation. However, heterogeneity in ultrasound timing, patient populations, equipment, and definitions of vascular regions has limited the ability to translate these measures into a universally accepted clinical test.^[4]

Endometrial and subendometrial blood flow can be assessed using colour or power Doppler. A review of the literature noted that blood supply is biologically relevant to implantation, while also emphasizing that studies have produced conflicting results because of differences in timing, patient selection and methods.^[5]

2.2 Applebaum scoring and Zone III vascularity

Applebaum originally described the uterine biophysical profile as a composite ultrasound-based assessment of uterine receptivity.^[3] Subsequent studies have used modified Applebaum scoring systems incorporating endometrial thickness, morphology, Zone III vascularity, myometrial echogenicity, uterine artery Doppler indices and end-diastolic flow.^[6]

In a 200-patient study of women undergoing embryo transfer, multifocal Zone III vascularity was associated with higher pregnancy rates, while absent endometrial flow was associated with failure to conceive in that study.^[6] These findings support the biological relevance of endometrial vascularity but should not be interpreted as proof that a particular vascularity finding independently determines implantation in every patient.

2.3 Contemporary evidence on predictive performance

A systematic review and meta-analysis of conventional and modern endometrial receptivity markers found associations between several ultrasound markers and pregnancy, but emphasized that their ability to predict clinical pregnancy was generally insufficient for routine clinical decision-making.^[7] A further systematic review and meta-analysis of ultrasound-assessed receptivity measures found differences between pregnancy and non-pregnancy groups for several measures, including endometrial thickness, endometrial volume and some vascularity indices, but also noted methodological heterogeneity and lack of consistently reliable conclusions.^[11] A separate meta-analysis of endometrial/subendometrial vasculature found associations between selected three-dimensional Doppler indices and pregnancy, while concluding that the predictive accuracy of these indices requires further evaluation.^[12]

Accordingly, restoration of Zone III vascularity in an individual patient should be interpreted

as an imaging observation rather than as a validated surrogate for implantation.

2.4 Ayurveda and infertility

A 2024 systematic review of Ayurveda interventions for infertility identified 14 studies involving 248 patients, including original studies and case reports. The review described encouraging signals but substantial heterogeneity, small sample sizes and lack of standardized treatment protocols, and called for more rigorous experimental research.^[10] This context is directly relevant to the present report: the case may contribute an objectively documented imaging observation, but it cannot establish the efficacy or mechanism of the intervention.

3. CASE PRESENTATION

3.1 Patient information

A woman in her mid-30s presented for infertility care and underwent serial follicular monitoring. The available ultrasound records identify her as 35 years in the first report and 36 years in the later report; the exact age should be reconciled against the clinical record before journal submission. The patient's name and other direct identifiers have been removed.

The available source material does not contain sufficient verified information regarding the duration of infertility, primary versus secondary infertility, menstrual regularity, obstetric history, prior fertility treatments, tubal patency, semen analysis, endocrine investigations, medical/surgical history, family history, psychosocial history, or relevant lifestyle factors. These elements should be completed from the original clinical record rather than inferred.

3.2 Clinical findings and diagnostic assessment

Serial follicular growth studies were used to assess follicular development, endometrial thickness and selected Doppler/receptivity parameters. In the pre-intervention cycle, the uterus was reported as normal in size and echotexture, measuring 47 × 25 × 32 mm; the right ovary measured 22 × 16 × 15 mm and the left ovary 24 × 13 × 14 mm. The Applebaum score was reported as 7, with Zone III vascularity absent.

During that cycle, on cycle day 10 the right dominant follicle measured 12 × 9 mm and the endometrium measured 5.3 mm with a Type 2 pattern. On cycle day 12 the dominant follicle measured 14 × 10 mm and the endometrium measured 6.9 mm. On cycle day 14 the dominant follicle was reported to have ruptured and the endometrium measured 7.2 mm. No free fluid

was documented in the pouch of Douglas in the baseline cycle.

In the subsequent monitored cycle, the uterus was reported as normal in size and echotexture, measuring $54 \times 27 \times 31$ mm. The right ovary measured $23 \times 10 \times 16$ mm and the left ovary $28 \times 15 \times 19$ mm. The Applebaum score was reported as 12 and Zone III vascularity was reported as present.

On cycle day 10, the left dominant follicle measured 14×12 mm and the endometrium measured 6.2 mm with a Type 2 pattern. On cycle day 12, the follicle measured 20×16 mm and the endometrium 6.8 mm. On cycle day 14, the follicle measured 21×17 mm and the endometrium 7.2 mm. On cycle day 15, the follicle remained 21×17 mm and the endometrium was 7.4 mm. On cycle day 16, the follicle measured 21×18 mm and the endometrium 7.7 mm. On cycle day 19, follicular rupture was reported, with endometrial thickness 7.8 mm and minimal free fluid in the pouch of Douglas.

Table 1: Serial ultrasound findings.

Cycle	Cycle day	Dominant follicle	Endometrial thickness	Remarks
Pre-intervention	10	Right 12×9 mm	5.3 mm, Type 2	No free fluid
Pre-intervention	12	Right 14×10 mm	6.9 mm, Type 2	—
Pre-intervention	14	Ruptured	7.2 mm, Type 2	No free fluid documented
Follow-up	10	Left 14×12 mm	6.2 mm, Type 2	No free fluid
Follow-up	12	Left 20×16 mm	6.8 mm, Type 2	—
Follow-up	14	Left 21×17 mm	7.2 mm, Type 2	—
Follow-up	15	Left 21×17 mm	7.4 mm, Type 2	—
Follow-up	16	Left 21×18 mm	7.7 mm, Type 2	—
Follow-up	19	Ruptured	7.8 mm, Type 2	Minimal free fluid in POD

4. THERAPEUTIC INTERVENTION

The treating team reported that the patient received one month of “Fertility Detox Treatment under the SAFE Axis Therapy Protocol” between the monitored cycles. The protocol was described clinically as an Ayurvedic fertility intervention.

For publication-quality reproducibility, the following must be inserted from the treatment record before submission: exact formulations/medicines; botanical or classical names; manufacturer; batch/quality information where relevant; dose and unit; route; frequency;

duration; timing relative to meals/cycle; any Panchakarma procedures; diet and lifestyle advice; supplements; conventional medicines; concurrent fertility treatment; and any treatment changes with their rationale. These details are intentionally not fabricated because they were not contained in the ultrasound records reviewed for this draft.

5. TIMELINE

Figure 1. CARE-adapted CONSORT-style timeline of the clinical episode



*Exact formulations, doses, route, adherence and co-interventions must be inserted from the treatment record before submission.

Figure 1: CARE-adapted CONSORT-style timeline of the clinical episode. The figure uses a flow/timeline presentation similar in visual logic to CONSORT, but CONSORT reporting itself is not applicable because this is a single-patient case report.

6. FOLLOW-UP AND OUTCOMES

The principal documented imaging changes were: (1) Applebaum score 7 to 12; (2) Zone III vascularity absent to present; (3) endometrial thickness at documented follicular rupture 7.2 to 7.8 mm; (4) maximum recorded dominant follicle size 14 × 10 mm in the pre-intervention cycle versus 21 × 18 mm in the follow-up cycle; (5) documented follicular rupture on cycle day 14 versus cycle day 19; and (6) pouch-of-Douglas free fluid none documented at baseline versus minimal free fluid after rupture in the follow-up cycle.

The maximum endometrial thickness increased by 0.6 mm, approximately 8.3%, and the Applebaum score increased by 5 points (approximately 71.4% relative to the baseline numerical score). These descriptive calculations should not be interpreted as effect sizes or evidence of treatment efficacy.

Pregnancy, biochemical pregnancy, clinical pregnancy, miscarriage and live birth outcomes

were not available in the source material reviewed for this draft. They must be added if documented.

Adherence, tolerability and adverse events were also not available in the source material. The final manuscript should state how adherence was assessed, whether any adverse or unanticipated events occurred, and whether the patient discontinued or modified any treatment.

Table 2: Main before-and-after observations.

Parameter	Pre-intervention	Follow-up
Applebaum score	7	12
Zone III vascularity	Absent	Present
Endometrial thickness at rupture	7.2 mm	7.8 mm
Maximum recorded dominant follicle	14×10 mm	21×18 mm
Documented rupture	CD14	CD19
POD free fluid	None documented	Minimal

7. DISCUSSION

This case describes a temporal association between a reported one-month Ayurvedic fertility intervention and subsequent improvement in several ultrasound parameters across two monitored cycles. The most visually distinct change was the report of Zone III endometrial vascularity changing from absent to present, accompanied by an increase in the reported Applebaum score from 7 to 12. The follow-up cycle also demonstrated progressive follicular growth to 21 × 18 mm and documented rupture on cycle day 19.

Zone III vascularity is an ultrasound descriptor of vascular penetration into the endometrial region used in Applebaum-derived classifications. In studies of infertile patients undergoing embryo transfer, deeper or multifocal endometrial vascularity has been associated with pregnancy outcomes.^[6,12] However, the broader literature demonstrates substantial heterogeneity and limited predictive accuracy for individual ultrasound markers.^[7,11] The present case therefore supports the statement that Zone III vascularity changed on serial assessment; it does not support the stronger claim that its restoration caused implantation or pregnancy.

The Applebaum uterine scoring concept is composite, and a change in total score can reflect changes in one or several components. In the present records, the reported total score changed from 7 to 12 and Zone III vascularity changed from absent to present. However, the source

documents available for this draft do not provide all component-level score values or the Doppler indices needed to independently reconstruct the total score. Consequently, the score should be reported as documented rather than reverse-engineered.

Endometrial thickness increased from 7.2 to 7.8 mm at the time of documented follicular rupture, while the dominant follicle reached a larger recorded size in the follow-up cycle. These findings are compatible with normal cycle-to-cycle variation as well as possible treatment-associated change. Endometrial thickness alone is an imperfect marker of receptivity, and the literature does not support using a single thickness threshold as a surrogate for implantation competence.^[7,11]

From an Ayurvedic clinical perspective, fertility is traditionally conceptualized as requiring coordinated adequacy of reproductive timing, the reproductive field, nourishment and gametes. Contemporary case reporting, however, requires a clear distinction between traditional therapeutic rationale and empirically demonstrated mechanism. The present case documents imaging changes after an Ayurvedic intervention but does not establish the biological mechanism through which those changes may have occurred.^[10]

Strengths of this report include serial objective imaging before and after the intervention, documentation of follicular growth across multiple cycle days, explicit reporting of Zone III vascularity and Applebaum score, and preservation of the original monitoring records in de-identified form. The case also highlights an imaging outcome that is more specific than simply reporting pregnancy status.

Several limitations materially affect interpretation. First, this is a single-patient observational case without a comparator. Second, cycle-to-cycle biological variation can produce changes in follicular growth and endometrial parameters independently of treatment. Third, the source reports do not provide a standardized Doppler acquisition protocol, machine settings, operator blinding, or component-level Applebaum scoring. Fourth, the intervention is not yet described at the level required for reproducibility. Fifth, relevant infertility factors and concurrent interventions have not been fully documented in the available records. Sixth, pregnancy and live-birth outcomes are unavailable. These limitations preclude causal inference.

The case suggests a testable hypothesis: standardized integrative fertility interventions may be

associated with measurable changes in endometrial vascularity and composite uterine ultrasound scores in selected patients.

Future prospective studies should prespecify inclusion criteria, infertility phenotype, treatment components, Doppler acquisition settings, operator training, blinded image review, timing of scans, component-level scoring, adverse-event monitoring and clinically meaningful reproductive outcomes including clinical pregnancy and live birth.

8. CONCLUSION

This CARE-compliant case report documents a cycle-to-cycle change in reported endometrial Zone III vascularity and Applebaum score, together with changes in follicular development and endometrial thickness, following a reported one-month Ayurvedic fertility intervention. The observation is clinically interesting and hypothesis-generating, but it does not establish that the intervention caused the imaging changes or improved implantation or pregnancy. Reproducible prospective studies are required before therapeutic efficacy can be inferred.

9. PATIENT PERSPECTIVE

To be completed using the patient's own words after obtaining permission to include the perspective. The authors should not create or paraphrase a patient perspective without verification.

10. INFORMED CONSENT

Written informed consent for publication of the case report and de-identified clinical images must be obtained from the patient before journal submission. The consent statement should be updated to match the journal's required wording.

11. ETHICS STATEMENT

For a single case report, institutional requirements vary. The authors should confirm whether institutional ethics committee/IRB review or a formal exemption determination is required by the target journal and local policy.

12. CONFLICTS OF INTEREST

To be completed by all authors. If the intervention or protocol is proprietary, commercial, or affiliated with an organization in which an author has a financial or professional interest, this relationship should be transparently disclosed.

13. FUNDING

No external funding was documented in the materials reviewed for this draft. Confirm with all authors and the institution before submission.

14. AUTHOR CONTRIBUTIONS

To be completed using the journal's preferred contributor taxonomy (for example, conceptualization, clinical care, data curation, imaging interpretation, writing—original draft, writing—review and editing, supervision).

15. DATA AVAILABILITY

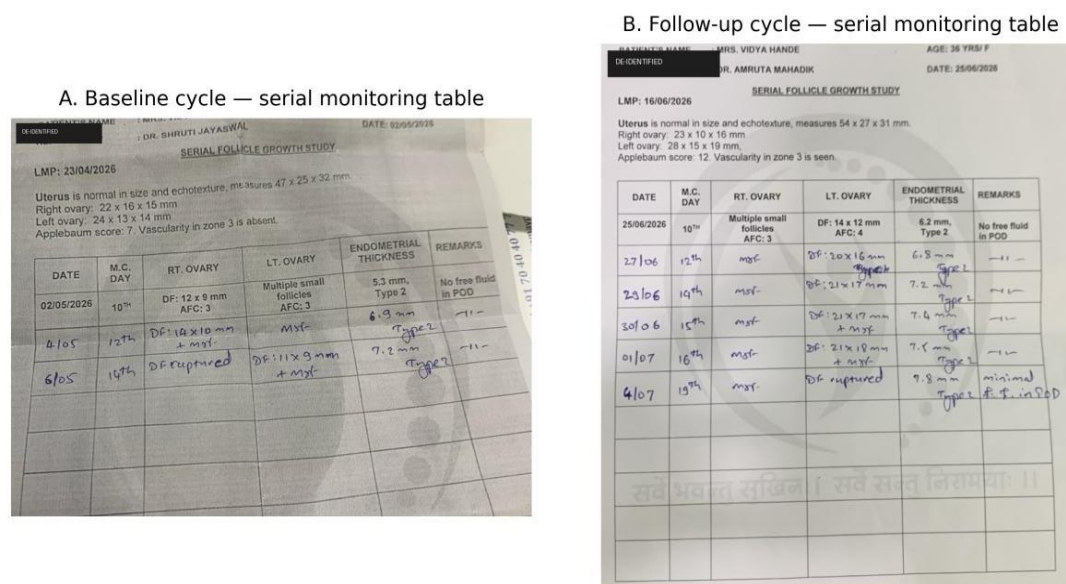
De-identified clinical data supporting this report are contained within the case report and its supplementary materials, subject to patient consent and applicable privacy requirements.

16. CARE CHECKLIST

CARE item	Section	Status	Manuscript location / action
1	Title	Present	Title identifies the clinical focus/intervention and includes “case report”.
2	Keywords	Revise	Seven keywords are currently listed; reduce to the target journal's 2–5 keyword limit if required.
3	Abstract	Present	Introduction, important findings, intervention, outcomes and conclusion are included.
4	Introduction	Present	Rationale and uniqueness are stated with literature support.
5	Patient information	Partial	Age discrepancy and key infertility history need verification/completion.
6	Clinical findings	Present	Available ultrasound findings are reported.
7	Timeline	Present	Figure 1 provides a chronological clinical timeline.
8	Diagnostic assessment	Partial	Ultrasound assessment is documented; full infertility work-up should be added if performed.
9	Therapeutic intervention	Partial	Intervention name and duration are stated; exact formulation/dose/route/frequency are required.
10	Follow-up and outcomes	Partial	Imaging outcomes are present; pregnancy outcome, adherence, tolerability and adverse events are pending.
11	Discussion	Present	Literature, strengths, limitations, rationale and take-away are addressed.
12	Patient perspective	Pending	Must be obtained from the patient in her own words.
13	Informed consent	Pending	Written publication consent required before submission.

17. FIGURES

Figure 2. De-identified serial follicle-monitoring records



Baseline: Applebaum 7; Zone III absent; DF 14×10 mm; ET 7.2 mm at rupture. Follow-up: Applebaum 12; Zone III present; DF 21×18 mm; ET 7.8 mm at rupture.

Only clinically relevant monitoring tables are shown; patient and administrative identifiers are excluded.

Figure 2: De-identified serial follicle-monitoring records. Only clinically relevant monitoring sections are shown; patient and administrative identifiers are excluded.

18. REFERENCES

1. World Health Organization. Guideline for the prevention, diagnosis and treatment of infertility. Geneva: WHO., 2025.
2. Practice Committee of the American Society for Reproductive Medicine. Fertility evaluation of infertile women: a committee opinion. Fertil Steril., 2021; 116(5): 1255-1265. doi:10.1016/j.fertnstert.2021.08.038.
3. Applebaum M. The uterine biophysical profile. Ultrasound Obstet Gynecol., 1995; 5(1): 67-68. doi:10.1046/j.1469-0705.1995.05010067.x.
4. Alcázar JL. Three-dimensional ultrasound assessment of endometrial receptivity: a review. Reprod Biol Endocrinol., 2006; 4: 56. doi:10.1186/1477-7827-4-56.
5. Ng EHY, Chan CCW, Tang OS, Yeung WSB, Ho PC. The role of endometrial blood flow measured by three-dimensional power Doppler ultrasound in the prediction of pregnancy

- during in vitro fertilization treatment. *Eur J Obstet Gynecol Reprod Biol.*, 2007; 135(1): 8-16. doi:10.1016/j.ejogrb.2007.06.006.
6. Khan MS, Shaikh A, Ratnani R. Ultrasonography and Doppler study to predict uterine receptivity in infertile patients undergoing embryo transfer. *J Obstet Gynaecol India*, 2016; 66(Suppl 1): 377-382. doi:10.1007/s13224-015-0742-5.
 7. Craciunas L, Gallos I, Chu J, Bourne T, Quenby S, Brosens JJ, Coomarasamy A. Conventional and modern markers of endometrial receptivity: a systematic review and meta-analysis. *Hum Reprod Update*, 2019; 25(2): 202-223. doi:10.1093/humupd/dmy044.
 8. Gagnier JJ, Kienle G, Altman DG, Moher D, Sox H, Riley D; CARE Group. The CARE guidelines: consensus-based clinical case reporting guideline development. *J Med Case Rep.*, 2013; 7: 223. doi:10.1186/1752-1947-7-223.
 9. Riley DS, Barber MS, Kienle GS, Aronson JK, von Schoen-Angerer T, Tugwell P, et al. CARE guidelines for case reports: explanation and elaboration document. *J Clin Epidemiol.*, 2017; 89: 218-235. doi:10.1016/j.jclinepi.2017.04.026.
 10. Rath I, Mavi A, Shannawaz M, Saeed S, Yadav A, Hasan S. Effectiveness of Ayurveda intervention in the management of infertility: a systematic review. *Cureus*, 2024; 16(4): e57730. doi:10.7759/cureus.57730.
 11. Wu J, Sheng J, Wu X, Wu Q. Ultrasound-assessed endometrial receptivity measures for the prediction of in vitro fertilization-embryo transfer clinical pregnancy outcomes: a meta-analysis and systematic review. *Exp Ther Med.*, 2023; 26(3): 453. doi:10.3892/etm.2023.12152.
 12. Wang J, Xia F, Zhou Y, Wei X, Zhuang Y, Huang Y. Association between endometrial/subendometrial vasculature and embryo transfer outcome: a meta-analysis and subgroup analysis. *J Ultrasound Med.*, 2018; 37(1): 149-163. doi:10.1002/jum.14319.