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DIETARY INTERVENTIONS IN ENDOMETRIOSIS

Lea Jankov[1*], Maja Obrovac Glišić[1]

[1] Nuferti d.o.o., Franca Prešerna 19, Karlovac, Croatia

Corresponding author: lea@majaog.com

Abstract

Endometriosis is a chronic inflammatory disease characterized by the presence of endometrial-like tissue anywhere outside the lining of the uterus, but usually on the outer surface of the uterus, ovaries, fallopian tubes, abdominal wall, intestines or lungs. This paper focuses on a female diagnosed with endometriosis and blocked fallopian tubes confirmed by Hysterosalpingo-Contrast Sonography test, HyCoSy test. After three months of supplementation with fibrinolytic enzymes, a repeat HyCoSy test revealed that both fallopian tubes were passable with a little more pressure. Five months after starting the fibrinolytic enzyme supplementation, she became spontaneously pregnant, however, the pregnancy unfortunately ended in a missed abortion. The paper also outlines the dietary measures and supplementation strategies implemented for the client. Dietary recommendations for endometriosis are based on lowering chronic systemic inflammation, supporting liver and gut health, and fibrinolysis of adhesions. Limitations of this paper include the single-patient focus. Nevertheless, this case provides compelling evidence of the potential for non-invasive, personalized interventions to achieve significant reproductive health improvements.

Keywords: *Endometriosis, inflammation, glycemia, gut health, nutritional deficits*

Introduction

Endometriosis is a chronic inflammatory disease characterized by the presence of endometrial-like tissue anywhere outside the lining of the uterus, but usually on the outer surface of the uterus, ovaries, fallopian tubes, abdominal wall, intestines or lungs (Barnard et al., 2023). It affects approximately 10% of the female population during their reproductive years (190 million cases in 2023, WHO) and 70% of women with chronic pelvic pain (Piecuch et al., 2023; Parasar et al., 2017). According to the Australian Longitudinal Study on Women's Health (ALSWH), around 1 in 7 (14%) women born between 1973 and 1978 had been diagnosed with endometriosis by the age 44-49.

If the lesions are in the muscular layer of the uterus, we are talking about adenomyosis, which is also commonly seen in women with endometriosis (Ottolina et al., 2024). Endometriosis is often accompanied by intra-uterine and intra-abdominal adhesions and fallopian tube blockage (hydrosalpinx). These are all common complications of endometriosis. Common symptoms include chronic pelvic pain, dysmenorrhea, dyspareunia, fertility complications, fatigue, heavy and prolonged periods, lower back pain, bloating, constipation, and diarrhea (Barnard et al., 2023; Lin et al., 2018). Less known symptoms are for thoracic endometriosis; shortness of breath, painful breathing, chest pain, pain in the chest and upper abdomen, and spontaneous pneumothorax (Nezhat et al., 2019). Because symptoms can overlap with many other conditions, it often takes more than 10 years to diagnose. Since most women with endometriosis experience symptoms beginning in adolescence, early referral, diagnosis, and treatment can help alleviate pain, prevent disease progression, and preserve fertility (Parasar et al., 2017).

Endometriosis is far more complex than just a condition associated with painful periods and infertility. It can present as asymptomatic or mildly symptomatic, even in cases with extensive tissue involvement and large cysts. On the other side, severe, paralyzing symptoms can occur with a small cyst and minimal, superficial lesions. The only definitive method for diagnosing and accurately assessing the condition is through laparoscopic or open surgery, which allows direct visualization of the affected tissues (Allaire et al., 2023).

Endometriosis is estrogen-dependent disease characterized by immune dysfunction (Zhang et al., 2023), estrogen dominance and progesterone resistance (Zhang and Wang, 2023), which leads to additional inflammation in the body. This hormone imbalance leads to heightened inflammation and may also promote lesion growth, increase the pelvic pain of the disease and decrease endometrial receptivity to embryo implantation (Marquardt et al., 2019). The pathogenesis of endometriosis is affected by numerous factors including immune, endocrine, genetic, and environmental influences (Zhang et al., 2023).

Dietary changes and appropriate supplementation have therapeutic potential in modifying chronic inflammatory processes and reducing pain perception. That is why dietary recommendations for endometriosis are based on lowering chronic systemic inflammation, supporting liver and gut health, and also fibrinolysis of adhesions (Donnez and Cacciottola, 2022; Qin et al., 2022).

Materials and Methods

Client description and medical history

A 40-year-old female diagnosed with endometriosis, insulin resistance, and Hashimoto's thyroiditis. In November 2023, she presented with a history of three failed IVF attempts, poor digestion (irregular bowel movements, occasional bloating and flatulation), disrupted sleep, and multiple nutritional deficiencies, including suboptimal levels of vitamins B12, B9, B6, D, and iron. Hormonal testing revealed high follicular and mid-luteal estradiol (showed in results of the DUTCH test), suboptimal mid-luteal progesterone (showed in results of the DUTCH test), and evidence of estrogen dominance. Her BMI was 18.6 kg/m², placing her in the lower range of the normal weight category.

The client reported pain in the lower vaginal area. Upon personal request, an MRI of the pelvis and lower back was performed in Dubai London Hospital LCC, Dubai, U.A.E. The findings indicated probable adenomyosis and an endometrioma on the left ovary. Both ovaries were adhered to the lateral peritoneum due to adhesions.

Hysterosalpingo-Contrast Sonography test (HyCoSy) was conducted in Feto Maternal & Genetyx Center, Dubai, U.A.E in February 2022. Test was performed to evaluate the patency (openness) of the fallopian tubes, which is essential for spontaneous conception. Test confirmed both fallopian tubes were blocked. In September 2022, the client became

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pregnant through an IVF procedure but unfortunately experienced a miscarriage at 9 weeks, followed by a curettage.

The client's family history revealed a pattern of estrogen dominance and thyroid disease. Both the client's mother and grandmother had breast cancer, while the mother also has hypothyroidism (previously diagnosed with hyperthyroidism), which is one of characteristic's of Hashimoto's thyroiditis.

Additional Testing

Advanced diagnostic testing via DUTCH test and GROW BABY test were performed, both conducted at Nordic Laboratories, Copenhagen K, Denmark. The DUTCH test revealed elevated oxidative stress at the cellular level, borderline high levels of 4-OH estrogen metabolites (revealing estrogen dominance), and a glutathione deficiency. Methylation was suboptimal, requiring intervention to enhance this critical biochemical process. Melatonin status was within normal ranges.

The GROW BABY test highlighted significant impairments in phase II liver detoxification and severely weakened methylation pathways (as also showed in DUTCH test). This indicates a need to minimize exposure to environmental toxins such as parabens, phthalates, plastics in cosmetics, and heavy metals in food and water and maximize detoxification pathways.

Dietary recommendations and supplementation

Dietary recommendations were focused on reducing systemic inflammation and supporting hormonal balance, emphasizing nutrient-dense, anti-inflammatory foods and minimizing processed and pro-inflammatory foods. It was crucial for the client to prioritize sufficient caloric, macronutrient, and micronutrient intake to promote healthy weight gain and muscle mass development. The types and doses of supplements are listed in Table 1.

The client was advised to make significant adjustments to her diet to support hormonal balance, reduce inflammation, and optimize overall health. One of the first steps was to eliminate coffee and caffeine entirely, as these can contribute to metabolic stress and hormonal imbalances. Minimizing gluten intake was strongly recommended due to her Hashimoto's and its potential role in exacerbating inflammation. To support digestion, especially when consuming gluten, it was recommended to take one capsule of digestive enzymes containing DPP-IV (Gluten DPP-IV digestive enzymes) at the start of each main meal. Additional measures included optimizing gut health with probiotics.

Special attention was given to stabilizing blood sugar levels. Instead of frequent small meals, the client was instructed to eat 3 main meals, ensuring balanced glycemic control. Every meal should include a high-quality source of protein, such as meat, fish, eggs, goat cheese, legumes, seeds, or nuts, with a daily target of at least 80 grams of protein. Regular consumption of white fish and small blue fish, such as sardines or anchovies, was advised to increase omega-3 fatty acid intake. The client was also encouraged to make her meals as nutrient-dense and diverse as possible by incorporating a variety of fresh vegetables. Additionally, she was encouraged to introduce a variety of cruciferous vegetables into her diet, to aid in hormonal detoxification and liver support. Furthermore, healthy fats like avocados, nut butters, and tahini were recommended to support hormonal health and ensure an adequate intake of essential fatty acids. It was advised to include 3-4 tablespoons of seeds and nuts spread throughout the day.

A comprehensive intervention plan was initiated in November 2023, targeting the multifactorial contributors to the client's condition. The intervention included a 3-month supplementation protocol with Boluoke lumbrokinase (120 mg of lumbrokinase daily) to address potential adhesions from curettage, as well as fibrin buildup and adhesions contributing to the blockage of the fallopian tubes.

We also needed to optimize estrogen levels and progesterone resistance with strong anti-inflammatory supplement protocol. These adjustments are designed to improve endometrial receptivity and enhance the sensitivity of progesterone receptors. Concurrently, nutritional deficiencies were addressed through targeted supplementation. Recommendations included avoiding synthetic folic acid and instead using methylated forms of folate (methylfolate) and vitamin B12 (methylcobalamin). Supplementation with adequate amounts of vitamins B2, B4, B6, zinc, selenium, glutathione, and omega-3 fatty acids were essential. In DUTCH test phase I metabolism showed a preference for 2-OH metabolism, which is the protective pathway. Following phase I metabolism, estrogen metabolites such as 4-OH and 2-OH (but not 16-OH) must undergo methylation to be safely deactivated and eliminated from the body. Glutathione is also important for phase II liver detoxification, that is necessary for elimination of excess estrogen from the body.

To further enhance detoxification and provide glycemic support, the

Table 1. Supplements list

Supplements	Dosage	How to take it
Gluten DPPIV digestive enzymes	3x1 capsules per day	1 capsule at the beginning of each meal
Omega 3 fatty acids	3 grams of EPA and DHA per day	With food
R-ALA	300 mg per day	With food
Liposomal glutathione	450 mg per day	Away from food
Boluoke lumbrokinase	3x2 capsules per day (in total 120 mg)	Away from food
Melatonin	1-3 mg	Before bed
Probiotic	1x per day	20 minutes before meal
Methyl folate (B9)	400 mcg	With food
Methyl cobalamin (B12)	500 mcg	With food
Zinc	25 mg	With food
Selenium	50 mcg	With food
Pyridoxal 5-phosphate (B6)	5 mg	With food

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antioxidant R-alpha lipoic acid (R-ALA) was included in the client's supplement regimen. Regular supplementation of vitamin D, with lab checks three times per year to ensure levels remain above 100 nmol/L. Iron and ferritin levels were closely monitored, with a target ferritin level above 50 µg/L, and supplementation was recommended if deficiencies were detected. Given the heavy menstrual bleeding, it was crucial to prevent the recurrence of anemia.

Emphasis was placed on maintaining optimal sleep hygiene, this included going to bed early and sleeping in complete darkness. If late nights were unavoidable, it was recommended to take 1-3 mg of melatonin during such periods to support the circadian rhythm.

Physical activity and other specialist

The client reported a high level of stress associated with three years of trying to conceive. As a result, psychotherapy was recommended to help manage the emotional stress and improve overall well-being. Psychotherapist worked with her on stress management techniques.

At the start of our work together, she began sessions with a physiotherapist specializing in pelvic floor health. The pelvic floor specialist provided significant support in helping her relax her body, identify specific areas requiring attention, and develop awareness and techniques for deep relaxation. This approach greatly complemented the overall treatment plan.

In terms of physical activity, the focus was placed on short, strength-based training sessions designed to build muscle mass while avoiding overexertion. This approach aimed to enhance overall physical resilience and support the client's hormonal balance and recovery process.

Progress was monitored via regular follow-up consultations. This tailored dietary approach was designed to address her specific nutritional deficiencies, support hormonal balance, and promote overall reproductive health.

Results and Discussion

After only three months of intervention, significant improvements were observed in reproductive health and biochemical markers (Table 2). A follow-up HyCoSy test performed in February 2024 at Feto Maternal & Genetyx Center in Dubai, U.A.E., showed that both fallopian tubes were passable with a little more pressure. This was an obvious improvement from the complete blockage found in 2022. These findings suggest the efficacy of lumbrokinase supplementation in addressing adhesions and improving fallopian tubes patency.

Lumbrokinase, a fibrinolytic enzyme extracted from the earthworm, supports the wound healing process. Due to its effective fibrinolytic activity and inhibitory effects on platelet aggregation, lumbrokinase has been clinically proven to prevent and treat cardiovascular disease. It does not activate plasminogen into plasmin, thereby reducing the risk of hemorrhage. Furthermore, it shows high specificity for fibrin and does not induce hyperfibrinolysis (Nguyen et al., 2023). It appears to be a pure fibrinolytic, without anticoagulant effects and does not interfere with the clotting cascade (Tjandrawinata et al., 2016). Additionally, it has been safely combined with warfarin, low-molecular weight heparin, and aspirin (Jiang et al., 2017; Kasim et al., 2009). Study done by Nguyen et al. in 2023 showed that lumbrokinase treatment significantly decreased the severity and the area of intra-abdominal adhesion in vivo in a dose-dependent manner compared with the controls.

Adhesions formation is known complication after curettage (that client had in late 2024 after pregnancy loss), as demonstrated by Sroussi et al. (2022). The same study indicates that curettage has the potential to lead to severe infertility.

Targeted supplementation corrected the client's nutritional deficiencies, improving her levels of vitamins B12, B9, B6, D, and iron. Deficiencies in B vitamins can cause low levels of methyl donors that are needed for methylation (phase II) of estrogen metabolites (2-OH-E1 and 4-OH-E1 metabolites) in liver - especially for the harmful 4-OH-E1 metabolite, because methylation makes it significantly less active (Chagay and Mkrtumyan, 2019).

Liposomal glutathione was also supplemented, it is a powerful antioxidant that plays a role in the body's detoxification processes, including the metabolism and elimination of excess estrogen (Kaplowitz, 1981). Glutathione supports phase II liver detoxification by binding to these potentially toxic metabolites, making them water-soluble for safe excretion through bile (Panda et al., 2023). Supplementation and lifestyle interventions aimed at reducing hormonal imbalances helped to reduce estrogen dominance and improved mid-luteal progesterone levels, addressing key contributors to the client's endometriosis

Table 2. Client's laboratory results

	Before treatment	**After treatment**
Lab. results:	**July 2023**	**February 2024**
	Both fallopian tubes blocked	Both fallopian tubes passable with a little more pressure
Vitamin B12	352.0 pmol/L	568 pmol/L
Folate		20.5 nmol/L
Vitamin D	176 nmol/L	88 nmol/L
Iron		18.44 µmol/L
Ferritin	81.39 ng/mL	55.60 ng/mL
3th day of menstrual cycle		
Estradiol	649 pmol/L	179 pmol/L
DHEAs	5.64 µmol/L	5.54 µmol/L
Glucose (0 min)	5.48 mmol/L	5.03 mmol/L
Insulin (0 min)	4.0 µIU/mL	4.7 µIU/mL
HOMA-IR	1	1.1

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symptoms. Improvements in digestion, sleep, and oxidative stress were also observed, contributing to the client's overall quality of life.

Probiotics were given to improve client's gut health. The gut microbiota plays a significant role in estrogen metabolism, and its balance can influence the development and progression of endometriosis. The gut microbiota has the ability to regulate circulating estrogen levels via the estrobolome. In a healthy gut, beta-glucuronidase activity is balanced, allowing the liver to effectively detoxify and eliminate excess estrogen. However, in cases of gut dysbiosis, excessive beta-glucuronidase activity can lead to increased reabsorption of estrogen back into circulation, contributing to estrogen dominance. A diet high in fiber from vegetables, fruits, and whole grains can help reduce beta-glucuronidase activity by promoting the growth of beneficial bacteria (Hu et al., 2023).

In April 2024, the client conceived spontaneously, a breakthrough that had previously been impossible due to blocked fallopian tubes. Unfortunately, the pregnancy resulted in a missed abortion at seven weeks. Despite this outcome, the spontaneous conception highlights restored fertility potential, underscoring the effectiveness of the comprehensive approach.

In October 2024, the client underwent an ultrasound at Medcare Women & Children Hospital in Dubai, U.A.E., which revealed significant improvements in her condition. Both ovaries were normal in size and shape, with no detectable cystic or solid lesions. There was no evidence of endometriotic foci or deep infiltrating endometriosis (DIE). Additionally, dynamic examination showed no signs of pelvic adhesions. Also, she repeated the HyCoSy test in November 2024 at Medcare Women & Children Hospital in Dubai, U.A.E., which revealed that both fallopian tubes were fully patent.

The client conceived spontaneously in October 2025 and gave birth to healthy baby girl, born at term in early July 2026.

Limitations of this paper include the single-patient focus. Nevertheless, this case provides evidence of the potential for non-invasive, personalized interventions to achieve significant reproductive health improvements, even in complex cases involving longstanding tubal blockage and hormonal dysregulation.

Conclusions

This case illustrates the potential of integrative interventions, particularly the use of lumbrokinase, to improve fallopian tube function and fertility in women with endometriosis and associated complications. High oxidative stress and impaired detoxification, identified through advanced testing, were addressed through dietary and supplement strategies targeting methylation and liver detoxification pathways. These findings align with existing research on the role of oxidative stress, suggesting that reducing inflammation and improving detoxification can restore reproductive health.

This case emphasizes the critical role of fibrinolytic enzymes in breaking down adhesions and improving outcomes, particularly in clients with advanced cases. These enzymes can be crucial in addressing the physical complications of endometriosis, such as formation of adhesions in pelvis and blocked fallopian tubes, as demonstrated in this case.

This paper highlights the importance of a holistic approach to addressing endometriosis, highlighting the connection of hormonal health, detoxification, and overall well-being. Early intervention can prevent the progression of the condition, making treatment more manageable, less costly, and shorter in duration. When cases progress significantly, as in this client's situation, therapy becomes far more intensive, expensive, and typically requires a minimum of six months to yield results.

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