

Ayurvedic Management of Mansik Avasaad (Depressive Disorder): A Case Report

ANNYA GAUTAM¹, MADHVI JAIN², VINOD ADE³, SHWETA PARWE⁴

ABSTRACT

Depression is a significant mental health issue that will impact most people's lives in one way or another. It can diminish someone's quality of life and have a negative impact on their ability to work and maintain relationships. The worst case scenario for severe depression is suicide. There still exists a societal stigma around depression due to its prevalence, suffering, dysfunction, morbidity, and financial burden. Currently, 80% of individuals with depression are not receiving any treatment. Historical ayurvedic literature sporadically mentions depression as both an illness (*manasika vyadhi*) and an emotional state. The purpose of the study was to assess the comprehensive Ayurvedic management strategy for depressive disorder. Here the authors discuss a case that involves a 23-year-old male patient presenting with chief complaints of poor concentration, weight loss, and social withdrawal. He was treated using ayurvedic principles such as *Sarvang Snehan*, *Baspa Sweda*, *Shirodhara*, and *Shamana Chikitsa*. After 15 days, the patient's symptoms were re-assessed, resulting in a satisfactory outcome and an overall improvement in his life. The combination of *snehan*, *swedana*, *shirodhara*, and *Shaman chikitsa* significantly facilitated the management of depression.

Keywords: Ayurveda, Satvajaya chikitsa, Shirodhara, Depressive disorder

CASE REPORT

In the current case, a 23-year-old male patient visited the outpatient department with chief complaint of weight loss (8 kg), lethargy, poor appetite, lack of interaction with family and friends, and difficulty concentrating on work for the past two years. The patient became increasingly reclusive and lost interest in social interactions. As his symptoms worsened day by day, he stopped eating. In terms of personal history, the patient was vegetarian, walks for 20 to 30 minutes daily, and experiences difficulty in sleeping due to overthinking. The patient was not addicted to any substances, and there was no personal or family history of illness.

Clinical examination revealed stable vital signs with a normal temperature, a pulse rate of 84 beats per minute, and blood pressure of 110/70 mmHg. Additionally, the respiratory rate was observed to be 18 breaths per minute. Systemic examinations, including those of the respiratory system, central nervous system, cardiovascular system, gastrointestinal system, and locomotor system, all yielded normal results.

As the patient's health deteriorated, his parents encouraged him to seek Ayurvedic treatment for management. Upon examination and history taking, it was discovered that the patient exhibited maximum *Avsada* (depression) symptoms along with some signs of a restricted eating disorder. His assessment resulted in a Hamilton Depression Rating Scale (HDRS) score of 25. Subsequently, the patient was advised to be admitted to the hospital for *Satvajaya Chikitsa* and Ayurvedic treatments.

The patient presented with a range of complaints, including weight loss, loss of appetite, poor concentration, premature ejaculation, and anhedonia, persisting for two years. Associated complaints such as fatigue, insomnia, low mood, and weakness were also noted, complicating the clinical presentation. The duration and overlapping nature of these complaints suggest a complex health challenge affecting the patient's overall well-being. A comprehensive assessment and tailored treatment plan addressing each complaint are crucial to alleviate symptoms and enhance the patient's quality of life.

The *Ashtavidha pariksha*, or eight-fold examination, is a fundamental

diagnostic method in Ayurveda aimed at evaluating various aspects of an individual's health. This examination involves assessing the pulse to determine the balance of *Vata* and *Pitta* doshas, as well as examining stool and urine to ascertain their normalcy based on the individual's *Prakriti* (constitution).

The appearance of the tongue indicates the state of *Saam dosha*, while speech clarity reflects mental clarity and coherence. Touch perception reveals sensitivity to temperature and texture. Vision assessment considers visual acuity and clarity. Lastly, the overall appearance is evaluated to determine if it aligns with the individual's *Madhyam prakriti* [1].

The *Dashvidha pariksha*, or Ten-fold Examination, is a comprehensive diagnostic approach in Ayurveda that evaluates various facets of an individual's health [1]. In this case, the patient's prakriti is identified as *Vata-Pitta*, while vikriti indicates imbalances in rakta (blood), rasa (bodily fluids), and *sukravaha* (reproductive system). The *Samhanan* reveals a weekly compact body structure. *Pramana measurements* show the patient to be underweight with a Body Mass Index (BMI) of 14.0 kg/m² before treatment, which improved slightly to 14.6 kg/m² after 15 days of treatment, with a weight increase from 43 kg to 45 kg. The patient exhibits *Madhyama satmya*, indicating moderate adaptability, and *Avarasatva*, suggesting average mental strength. *Ahara shakti* is deemed average, while *Vyayam shakti* is low.

Considering the patient's *Yuvaavastha* (youthful age), a treatment plan involving *Panchakarma* and *Shamana* therapies was devised to address their condition comprehensively and restore balance to their overall health and well-being.

The overall treatment plan: External therapy for the patient involves a structured protocol consisting of two main procedures conducted over a span of 10 days each. The first procedure, *Sarvang snehana*, employs *Bala Ashwagandha* oil for a full-body oleation massage. This therapy aims to nourish tissues, alleviate muscular tension, and promote overall relaxation and rejuvenation. The second procedure, *Shirodhara*, utilises a blend of *Brahmi* oil and *Amla* oil. During *Shirodhara*, a continuous stream of warm herbal oil is gently poured onto the forehead, targeting the mind

and nervous system to induce profound relaxation, mental clarity, and emotional balance.

Shamana chikitsa, constituting internal medicine, outlines a structured treatment plan aimed at alleviating the patient's symptoms over a period of 15 days. This regimen comprises five medicinal interventions tailored to address specific health concerns. *Ashwandharishta*, administered at a dosage of 15 ml twice daily with lukewarm water after food, aims to promote vitality and overall well-being. *Cap. Herbokam*, taken as one capsule twice daily after meals, contributes to enhancing the body's resilience and vigor. *Vanari kalpa*, consumed at a dosage of two teaspoons twice daily with milk, supports reproductive health and vitality. Syrup *Shankhapushpi*, ingested at 10 ml twice daily after meals, aids in improving cognitive function and reducing mental stress. Finally, *Avipatkar churna*, consumed at five grams twice daily before meals with lukewarm water, helps in alleviating digestive discomfort and promoting gastrointestinal health.

This comprehensive approach to internal medicine targets multiple aspects of the patient's health, aiming for symptom relief and overall well-being within the specified timeframe. The prescribed *yoga asanas* and meditation routine offer a holistic approach to improving the patient's physical and mental well-being. This daily regimen comprises five key practices, starting with *Savasana* for deep relaxation, followed by *Shishuasana* to release back tension. *Anulom vilom* breathing balances life force energy, while *Om japa* fosters mental calmness. Listening to the *Maha Mrityunnjaya Mantra* enhances spiritual nourishment. Together, these practices aim to promote relaxation, mental clarity, and spiritual growth, contributing to the patient's overall health and wellness. The prescribed *pathya* regimen emphasises the importance of maintaining a balanced lifestyle and diet conducive to overall well-being. It includes ensuring adequate sleep of eight hours at night and incorporating ghee and foods with *Madhura Rasa* (sweet taste) into the diet, such as easily digestible options like moong dal, khichadi, and seasonal fruits. Conversely, the *apathya* regimen advises against consuming hot and spicy foods, excessive salt, fried foods, sour fruits, and fermented items like curd and pickles. It also cautions against night awakening and excessive daytime sleeping.

Follow-up and outcome: The patient was hospitalised for the first 12 days of treatment, during which *Panchakarma* procedures were performed along with *Satvavajaya chikitsa* and *shaman chikitsa*. The patient was taught to assess and quantify worry and their relaxed state of mind. *Mantra uchharan* with adequate yoga guidance and daily assignments were given to keep the patient involved. Giving the patient a reward for finishing the previous task motivates them to do the next one more successfully. Encourage them every day by sharing stories of people who have overcome similar obstacles to reach optimism in their lives. Urge the patient to commit to memory the perfect representation of God and to stand up for themselves when they feel like giving up. These were used for the modulation of *Satvavajaya chikitsa*. During this period, the patient showed improvement in worry, relaxed state of mind, worthlessness, lack of interest, and interacting with others. After 15 days of follow-up, the patient's condition was much improved. The patient felt rejuvenated and good. Their mental state, communication, and socialisation improved.

On the 15th-day follow-up, the patient's treatment regimen includes three medications aimed at supporting their continued recovery.

Tablet Liv 52 DS is prescribed to be taken twice daily before meals. Tablet Vigomax Forte is to be taken twice daily after meals with milk. Additionally, Syrup Memerin is recommended twice daily after meals to support cognitive function and memory. With a duration of 15 days, this follow-up plan aims to sustain the progress made and further contribute to the patient's overall well-being.

Before treatment, the patient reported spending approximately three to four hours daily in a state of relaxation, which significantly

improved to 12 to 16 hours per day after intervention. Conversely, worrying consumed the majority of their day, totaling 12 to 14 hours before treatment and significantly decreasing to only one to two hours per day post-treatment. Sleep duration also notably increased from a mere three to four hours to a more restorative eight hours per night. Furthermore, the HDRS score dropped from 25 before treatment to seven after the intervention, indicating a marked improvement in depressive symptoms [Table/Fig-1]. These changes collectively suggest a positive response to the treatment regimen, with significant enhancements in relaxation, worry reduction, sleep quality, and depressive symptoms observed within a 15-day period.

Sr. no.	Intervention	Before treatment (0 th day)	After treatment (15 th day)
01	Daily diary (Relaxed) (hours)	3-4 hours/day	12-16 hours/day
02	Daily diary (Worry) (hours)	12-14 hrs/day	1-2 hours/day
03	Sleep (hours)	3-4 hr	8 hours
04	Hamilton Depression Rating Scale (HDRS) score	25	7

[Table/Fig-1]: Assessment Criteria during the period of intervention.

DISCUSSION

Emotions are fundamental aspects of human existence, or *manasika bhava*. However, a person may be experiencing mental illness if their feelings, thoughts, or behaviour frequently cause them distress or interfere with their daily activities and those around them. Although it is estimated that upto one in five persons have some sort of mental illness, there is still stigma and discrimination associated with it. In most cases, depression is an untreated illness that is not widely acknowledged or treated. When it comes to matters of health, Ayurveda places special emphasis on the mind and its diseases. Each and every Ayurvedic classic discusses both physical diseases and their psychological effects. Ayurvedic descriptions of psychiatric diseases from thousands of years ago are still applicable today [2].

Depression affects individuals of all ages, from all backgrounds, and throughout the world. It causes mental suffering and affects people's capacity to perform even simple tasks, sometimes with painful repercussions on family and societal interactions. The worst-case scenario for depression is suicide. It results from disturbances in the body's essential elements, including *tridosha*, *triguna*, *rasa dhathu*, *manovaha srotas*, *satwa*, *jnanendriya* and *karmendriya*, *agni*, and *ojas*. Yoga, in the form of dynamic exercise and pranayama, can be practiced as a counter-agent and prophylactic to the medicine and dietary patterns that improve cognitive function. The moral codes of conduct (*achara rasayana*), *sadvritta*, and *ritucharya* (seasonal regimens) described in our science can all be put into practice as preventative measures [3].

Similar studies [4-6] have consistently shown that *satvavajaya chikitsa*, oral medicines, *shirodhara*, *takradhara*, and other external *panchakarma* procedures play a major role in treating depression [Table/Fig-2]. The primary *medhya* and *balya* characteristics of the oral drugs employed in these studies demonstrate that medication alone is ineffective in treating depression. Counseling also plays a significant role in improving the patient's condition. As a result, this study demonstrates highly significant results in patients with depression. Counseling helps patients improve their mental toughness and increases the effort that patients' relatives put forth on their behalf. All of these subjects fall under *Satvavajaya*. The primary effect of the entire treatment plan in the current case study was positivity, which the patient was encouraged to emphasize with the use of *panchakarma*, yoga, meditation, and medicine. After *panchakarma* procedures, the following oral medications were administered: *Ashwagandharista*, Syrup *Shankhapushpi*, *Avipatkar churna*, and *Vanari kalpa* throughout the treatment period. The

S. no.	Authors studies and year of publication	Case presentation	Treatment	Outcome
01.	Tubaki B et al., 2021 [4]	Ayurveda management of major depressive disorder: A case study. A 52 years female pt presented with disturbed sleep, sadness, worthlessness, helplessness, death wishes, and increased crying spells since past 33 years and her symptoms had aggravated since last one year.	Ayurvedic treatment plan, includes Snehapana, Sarvanga Abhyanga, Snigdha Virechana, <i>Shirodhara</i> , <i>Shiropichu</i> for 13 days along with oral medication and <i>Satwawajaya Chikitsa</i> for 269 days.	Self-assessment of worry reduced from 16 hours/day to 2 hours/day. Relaxed state of mind improved from 0.5 hours/day to 14hours/day, and HDRS total score reduced from 31 to 6 in total duration of 352 days.
02.	Goyal P et al., 2022 [5]	Ayurvedic management of Manoavsada (Depression): Case report. A16-year-old female Patient started losing interest in social activities and isolated herself. She had complained of anorexia and became badly aggressive. Her weight felt to 35 kg from 60 kg.	Ayurvedic treatment plan, including <i>Panchakarma</i> like snehana, sweadana, <i>shirodhara</i> along with <i>shamana chikitsa</i> . <i>Satvavya chikitsa</i> and <i>yog Chikitsa</i> for total duration 14 days.	HDRS total score reduced to 09 from 23 and insomnia severity index reduced to 03 from 16 in total duration of 14 days.
03.	Thasni M et al., 2022 [6]	Ayurvedic management of moderate depressive disorder- a case report. A 42-year-old female patient presented herself with primary concerns of increased thoughts, disturbed sleep, fatigue, decreased appetite and was tensed even in minor matters since 10 years.	The treatment protocol including Snehapana, Vamana, Virechana and Vasthi and oral medication.	Beck's depression Inventory reduced to 32 to 15 and Q-LES-Q-SF questionnaire improved from 37 to 55.
04.	Current study	Ayurvedic Management of Mansik Avasaad (Depressive Disorder)-A case report	The treatment protocol including <i>Sarvang Snehana</i> , <i>Shirodhara</i> along with <i>Shaman Chikitsa</i> .	Following the session, the patient's Hamilton Depression Rating Scale (HDRS) score decreased from 25 to 7. Her daily diary (Relaxed) (h) increased from 3-4 h to 12-16 h and worry dairy decreased from 12-14 h to 1-2 h.

[Table/Fig-2]: Similar Parameter of different studies [4-6].

patient had gradual and sustained clinical improvement. Mode of Action of *Sarvang Abhyanga*: *Abhyanga* is a traditional Ayurvedic practice that has demonstrated effectiveness in the treatment and prevention of disease. It has been described as an external method of administering oil or unctuous substances to the body by rubbing, whether they are medicinal or not, with the goal of restoring the balance of Dosha by acting both locally and systemically [7].

Bala ashwagandha taila is an herbal remedy that mostly contains *bala*, *ashwagandha*, and *laksha*. It is prescribed for arthritis and to strengthen the muscles, etc. It also possesses antipyretic, antispasmodic, antiseptic, and analgesic qualities. *Ashwagandha* has immune-boosting, antistress, anti-inflammatory, and antioxidant effects [8].

Mode of action of *Shirodhara*: *Shirodhara* is a combination of the Sanskrit words *shiro* (head) and *dhara* (to flow). *Shirodhara* is a type of independent snehana technique in which liquids are gently poured over the forehead. It is traditionally recommended for a number of neurobehavioral and psychosomatic diseases [9].

The well-known Ayurvedic herb *brahmi*, also known by its botanical name *Bacopa monnieri*, is used to boost mental acuity, focus, and memory. It is a combination of the Vata and Kapha doshas. Due to its *ushna virya*, or hot potency, it calms excessive Kapha and Vata dosha. *Brahmi* is helpful for all psychiatric disorders like depression, anxiety, OCD, etc. It supports the heart, blood vessels, and nerves [10]. *Amla* balances the *vata*, *pitta*, and *kapha dosha*. It has antiaging and rejuvenating properties.

Mode of action of *Ashwagandharista*: A fermented remedy known as *ashwagandharishta* is used to treat neurological and behavioral ailments. Additionally, it is administered as a general tonic. As one of the key ingredients, *ashwagandha* exhibits properties such as *jivaniya*, *medhya*, *rasayana*, anti-stress, adaptogenic, hypnotic, anxiolytic, sedative, *balya*, and *brimhana*. It can be used to treat chronic neurological, musculoskeletal, psychological, and emaciation-related illnesses [11].

Mode of action of capsule *Herbokam*: The triple-in-one *Herbokam* plus capsule contains three herbal extracts from *Brahmi*, *Jatamansi*, and *Ashwagandha*. Adults who use these pills report feeling more relaxed, getting better sleep, reducing anxiety, and waking up feeling rejuvenated. This natural remedy revives the nerve system and soothes the mind to encourage restful sleep, making it useful for stress-related exhaustion and insomnia. This capsule helps to revitalise and rejuvenate the body [12].

Mode of action of *Vanari Kalp*: It is a Sandu Pharmaceuticals-exclusive medication. It mostly consists of *kapikacchu* and *kalpa*,

which are created with the aid of sugar. It claims that it can aid in restoring virility and potency. It enhances physical stamina, lowers stress, encourages well-being, and is an effective aphrodisiac [13].

Mode of action of *Syrup Shankhapushpi*: One of the most significant *Medhya Rasayana* medications in *Ayurveda*. The herb is astringent and bitter, and its use enhances the balance and vitiation in the Kaphavata-pitta doshas. Herbalists theorise that *Shankhapushpi* soothes nerves by controlling the body's production of cortisol and adrenaline, two stress chemicals. This medication exhibits antidepressant, antidiabetic, cardioprotective, sedative, antioxidant, neuroprotective, and hypolipidemic effects. It boosts memory and learning abilities. The hypotensive qualities of the flowers and leaves are used to treat anxiety neurosis [14].

Mode of action of *Avipattikar Churna*: *Avipattikar Churna* is used to treat gastrointestinal issues. Constipation and gastritis can both be effectively treated with it. It contains potent therapeutic herbs that help reduce the symptoms of certain disorders and promote the digestive tract's normal operations. It also functions as an appetiser and is therefore frequently administered to patients who are experiencing loss of appetite as a result of various illnesses such as depression, gastric ulcers, and any chronic crippling ailment [15].

Mode of action of *LIV 52 DS*: It increases the liver's and spleen's functional effectiveness while protecting the liver's histological architecture and having positive effects on the liver's glycogen and serum proteins. It has strong antioxidant properties due to how it affects lipid peroxidation [16].

Mode of action of tablet *Vigomax Forte*: The *Vigomax Forte* Tablet improves erectile and sexual function. *Ashwagandha* is effective in preventing early ejaculation. *Kapikacchu* has aphrodisiac properties, boosts vigor, and treats neurological disorders. *Safed Musli* boosts libido and physical endurance. *Vata* is balanced by *erand mula* [17].

Mode of action of syrup *Memorin*: It is one of the best Ayurvedic herbs used to treat fever, tension, and anxiety while enhancing memory, intelligence, speech, immunity, and digestion [18].

CONCLUSION(S)

Ayurveda offers an integrated approach to effectively address psychiatric disorders by restoring dosha balance through *Yukti Vyapashraya chikitsa* along with *Satvavajaya* techniques such as yoga and counselling play a crucial role in treating these types of cases. Counselling sessions for both the patient and their family contribute to enhancing overall well-being. However, further research is needed to validate these findings and gain international recognition.

REFERENCES

- [1] Rohit S, Hetal A, Prajapati PK. Astasthan Pariksha-A diagnostic method of Yogaratnakara and its clinical importance. *Global Journal of Research on Medicinal Plants & Indigenous Medicine*. 2012;1(5):186.
- [2] Bloom DE, Cafiero E, Jané-Llopis E, Abrahams-Gessel S, Bloom LR, Fathima S, et al. The global economic burden of noncommunicable diseases. *Program on the Global Demography of Aging*; 2012 Jan. https://www.hsph.harvard.edu/pgda/wp-content/uploads/sites/1288/2013/10/PGDA_WP_87.pdf
- [3] Madhavi AR, Savitha HP. Depression-an ayurvedic outlook. *J Ayu Holistic Med*. 2017;5(2):12-23.
- [4] Tubaki BR, Chandake S, Sarhyal A. Ayurveda management of major depressive disorder: A case study. *Journal of Ayurveda and Integrative Medicine*. 2021;12:378-83. Doi: 10.1016/j.jaim.2021.03.012. Epub 20 May 2021 [PubMed: 34024690] [PubMed Central: PMC8186000].
- [5] Goyal P, Mishra D. Ayurvedic management on Manoavsada (depression): Case report. *Int J Ayu Pharm Res*. 2022;10(5):69-63.
- [6] Thasni M, Jithesh M, Brinu JA. Ayurvedic management of moderate depressive disorder-A case report. *International Journal of Ayurveda and Pharma Research*. 2022;10(4):37-43.
- [7] Sharma N, Kumar A, Panja AK. Abhyanga: A conceptual review. *World Journal of Pharmaceutical Research*. 2015;4 (11):585-92.
- [8] Raut RG. Analytical study of balaashwagandha taila. *Int J Ayur Alli Sci*. 2014;3:171-76. <http://indianmedicine.eldoc.ub.rug.nl/id/eprint/69147>
- [9] Moharana H, Mahapatra AK, Maharana L, Kumar Singh S. Therapeutic efficacy and mechanism of action of ayurvedic shirodhara: An evidence based review. *World Journal of Ayurveda Shirodhara*. 2017;2(1):131-39.
- [10] Roodenrys S, Booth D, Bulzomi S, Phipps A, Micallef C, Smoker J. Chronic effects of Brahmi (*Bacopa monnieri*) on human memory. *Neuropsychopharmacol*. 2002;27(2):279-81.
- [11] Acharya RS. Clinical indications of Ashwagandharishta an experiential and scientific view. *Journal of Ayurveda and Integrated Medical Sciences*. 2022;7(1):116-18.
- [12] Herbules. HERBOKAM Plus Capsules: A natural tranquilizer, promotes deep & revitalizing sleep. Nagpur, Maharashtra, India. Herbules. Available from: <https://www.herbules.in/herbokam-plus.html>.
- [13] Sandu. Navi Mubai, India. Available from: <https://sandu.in/product/sandu-varanikalpa-ayurvedic-herbalmedicine-for-men-health-improve-strength-200-g/> Cited date of access: 10/08/2022.
- [14] Jalwal P, Singh B, Dahiya J, Khokhara S. A comprehensive review on shankpushpi a morning glory. *The Pharma Innovation*. 2016;5(1, Part A):14.
- [15] Patil S, Shah S. Preparation, quality control and stability studies of avipattikar churna. *Journal of Drug Delivery and Therapeutics*. 2019;9(3-s):531-36.
- [16] Maity SG, Mandal AK. A clinical comparative study to evaluate the efficacy and safety of Liv. 52 DS tablets in Non-Alcoholic Steatohepatitis (NASH). *World J Pharm Res*. 2015;4(7):388-414.
- [17] Singh A. Evaluation of clinical efficacy of the Vigomax Forte Tablet in male sexual dysfunction. *Journal of Ayurveda and Integrated Medical Sciences*. 2023;8(4):01-08.
- [18] Ayurmed Info. Memorin syrup uses, doses, ingredients, side effects. *Easy Ayurveda*. 2023. Available from: <https://www.ayurmedinfo.com/2018/09/01/memorin-syrup/>.

PARTICULARS OF CONTRIBUTORS:

1. PG Scholar, Department of Panchakarma, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
2. PG Scholar, Department of Panchakarma, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
3. Professor, Department of Panchakarma, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.
4. Professor and Head, Department of Panchakarma, Datta Meghe Institute of Higher Education and Research, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dr. Annya Gautam,
Mahatma Gandhi Ayurved Medical College Hospital and Research Center,
Salod, (Sawangi), Wardha, Maharashtra-442001, India.
E-mail: ananyagautam68@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: Dec 06, 2023
- Manual Googling: Feb 15, 2024
- iThenticate Software: Apr 09, 2024 (7%)

ETYMOLOGY: Author Origin

EMENDATIONS: 7

AUTHOR DECLARATION:

- Financial or Other Competing Interests: None
- Was Ethics Committee Approval Obtained for this study? Yes
- Was informed consent obtained from the subjects involved in the study? Yes
- For any images presented appropriate consent has been obtained from the subjects. Yes

Date of Submission: **Dec 13, 2023**

Date of Peer Review: **Feb 03, 2024**

Date of Acceptance: **Apr 11, 2024**

Date of Publishing: **Jun 01, 2024**