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Integrative approach in Heart Failure: Role of *Panchakarma* in a patient with Reduced ejection fraction

Akash Patidar[1] and Dattu N Bandapalle[2]

[1,2]Department of Rachana Sharir, Parul Institute of Ayurved, Parul University, Vadodara - 391760 (India)

Abstract

Heart failure with reduced ejection fraction (HFrEF), particularly due to ischemic cardiomyopathy, remains a challenging clinical condition with high morbidity and poor prognosis. Standard pharmacological and device-based therapies offer significant benefit, but a subset of patients remains symptomatic with minimal improvement in cardiac function. Panchakarma, the classical detoxification and rejuvenation system in Ayurveda, is increasingly being investigated for its supportive role in chronic cardiovascular conditions.

This case study explores the integrative management of a 76-year-old male with ischemic cardiomyopathy (baseline LVEF 35% and regional wall motion abnormalities) through a comprehensive Panchakarma protocol. Over a period of 12 weeks, the patient demonstrated significant clinical improvement, including an increase in LVEF to 40%, partial resolution of RWMA, and enhancement in quality of life. These findings highlight the potential of integrative cardiac rehabilitation using Panchakarma in improving myocardial function, warranting further research through controlled clinical trials.

Key words : Panchakarma, HFrEF, Ischemic Cardiomyopathy, Lvef, Rwma, Ayurveda, Cardiac Rehabilitation, Arjuna, Rasayana.

Heart failure (HF) is a complex clinical syndrome caused by structural or functional impairment of the heart's ability to fill or eject blood. Among its types, Heart Failure with Reduced Ejection Fraction (HFrEF), defined by an LVEF below 40%, is the most common and challenging. It carries high risks of morbidity, mortality, and frequent hospitalizations, despite advances in pharmacological and device-based therapies such as ACE inhibitors, beta-blockers, mineralocorticoid receptor antagonists, SGLT2 inhibitors, and implantable defibrillators. A key feature in HFrEF, especially in ischemic cardiomyopathy, is Regional Wall Motion Abnormalities (RWMA), indicating localized heart muscle

[1]Post graduate Scholar, [2]Professor

dysfunction that predicts worse outcomes. While standard treatments target neurohormonal balance and fluid management, ventricular remodeling often progresses, highlighting the need for more holistic approaches. Integrative medicine, combining modern cardiology with traditional systems like Ayurveda, is gaining interest, particularly for chronic cardiovascular diseases.

Ayurveda conceptualizes heart failure under "Hridroga," attributing it to imbalances in *Vata* and *Kapha doshas,* toxin accumulation, and disrupted circulation. Panchakarma, a five-step detoxification and rejuvenation therapy, plays a central role in Ayurvedic treatment by reducing inflammation, improving circulation, regulating autonomic function, and supporting tissue regeneration. Common herbs used in Panchakarma protocols—such as *Terminalia arjuna, Withania somnifera (Ashwagandha), Tinospora cordifolia (Guduchi),* and *Abhrak Bhasma*—have demonstrated cardiotonic, anti-inflammatory, and antioxidant effects, with evidence supporting their benefits on myocardial function and stress reduction. Additionally, Panchakarma's positive impact on autonomic regulation and mental wellbeing may improve quality of life and treatment adherence in heart failure patients. Though clinical evidence remains limited, early findings and traditional knowledge support the potential of integrating *Panchakarma* with conventional care to enhance outcomes in chronic heart failure.

This case study presents a 76-year-old male with ischemic cardiomyopathy, HFrEF (LVEF 35%), and documented RWMA, who underwent structured Panchakarma therapy. It highlights the clinical course, therapeutic interventions, and outcomes—including improvement in LVEF and regional wall motion—demonstrating the potential role of Ayurveda in complementing conventional cardiac rehabilitation.

Case presentation :

Patient profile:

- Name: Rajaram Gadhvi
- Age: 76 years
- Sex: Male
- Occupation: Retired government employee
- Marital Status: Married
- Weight: 78 kg
- Height: 172 cm
- BMI: 26.4 kg/m²
- Lifestyle: Sedentary
- Addictions: Chronic tobacco user
- Diet: vegetarian

Chief complaints :

The patient presented with:

- Exertional dyspnea for 7 months
- Fatigue and reduced exercise tolerance (could walk only ~80 meters without distress)
- Bilateral lower limb edema since 15 days
- Palpitations and occasional chest heaviness

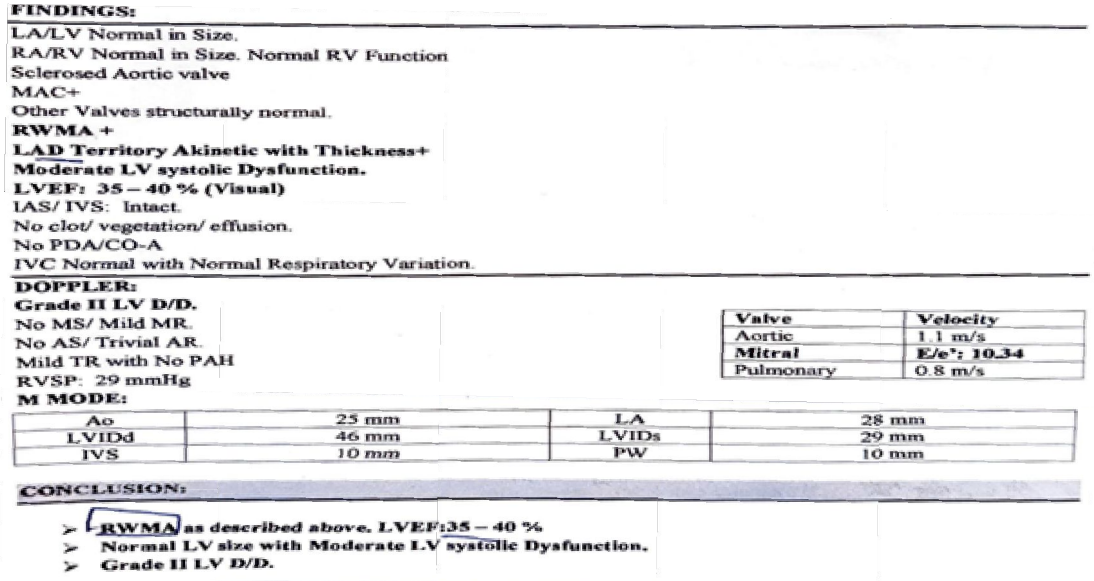
Past medical history :

- Anterior Wall Myocardial Infarction (AWMI): 1 year prior, managed with thrombolysis
- Ischemic Cardiomyopathy: Diagnosed post-MI with progressive LVEF decline
- Type 2 Diabetes Mellitus: Diagnosed 5 years ago; on medications
- Hypertension: 7 years
- Dyslipidemia: On statin therapy
- Ongoing Medications:

- Carvedilol 6.25 mg BD
- Ramipril 5 mg OD
- Furosemide 40 mg OD
- Atorvastatin 20 mg OD
- Aspirin 75 mg OD
- Tab Metformin + Glimeperide (500/2) bd
- Tab Atenolol 50 mg BD

Baseline Investigations (Feb 2025) :

- Echocardiography:
  - LVEF: 35 %
  - RWMA : LAD Territory akinetic with thickness++
  - Moderate LV systolic dysfunction
  - Diastolic dysfunction: Grade 2
- ECG: Sinus rhythm, Q waves in anterior leads
- Blood Pressure: 140/90 mmHg
- Fasting Blood Glucose: 131 mg/dL
- HbA1c: 7.9%
- Serum Creatinine: 1.26 mg/dL
- Serum Potassium: 4.4 mEq/L
- Lipid Profile:
  - LDL: 110 mg/dL
  - HDL: 36 mg/dL
  - Triglycerides: 180 mg/dL
- Thyroid Profile: Within normal limits



FINDINGS:

LA/LV Normal in Size.
RA/RV Normal in Size. Normal RV Function
Sclerosed Aortic valve
MAC+
Other Valves structurally normal.
RWMA +
LAD Territory Akinetic with Thickness+
Moderate LV systolic Dysfunction.
LVEF: 35 – 40 % (Visual)
IAS/ IVS: Intact.
No clot/ vegetation/ effusion.
No PDA/CO-A
IVC Normal with Normal Respiratory Variation.

DOPPLER:

Grade II LV D/D.
No MS/ Mild MR.
No AS/ Trivial AR.
Mild TR with No PAH
RVSP: 29 mmHg

Valve	Velocity
Aortic	1.1 m/s
Mitral	E/e': 10.34
Pulmonary	0.8 m/s

M MODE:

Ao	25 mm	LA	28 mm
LVIDd	46 mm	LVIDs	29 mm
IVS	10 mm	PW	10 mm

CONCLUSION:

- **RWMA as described above. LVEF:35 – 40 %**
- **Normal LV size with Moderate LV systolic Dysfunction.**
- **Grade II LV D/D.**

Before Treatment

Psychological and Functional Assessment:

- 6-Minute Walk Test (6MWT): 80 meters
- Anxiety/Depression Screening: Moderate anxiety (GAD-7 score: 11)
- Quality of Life Score (WHOQOL-BREF): Below average in physical and psychological domains

Patient Decision for Integrative Therapy :

Despite adherence to conventional heart failure treatment, the patient remained symptomatic and expressed interest inayurvedic therapies. After discussion with the cardiologist and Ayurvedic consultant, the patient was enrolled in a 12-week integrative cardiac

rehabilitation program, starting with 4 weeks of inpatient Panchakarma therapy, followed by outpatient Rasayana (rejuvenation) therapy.

Integrative Panchakarma Treatment Plan :

The patient underwent a carefully structured Ayurvedic Panchakarma protocol spanning 4 weeks of inpatient care, followed by 8 weeks of outpatient Rasayana therapy. The treatment was designed and administered under the joint supervision of an experienced Ayurvedic physician and a cardiologist, ensuring safety and compatibility with ongoing conventional cardiac medications.

Purvakarma (Preparatory Therapies) :

The preparatory phase aimed to gently prepare the body for deep detoxification by loosening and mobilizing toxins (Ama) and balancing the aggravated Doshas, particularly Vata and Kapha, implicated in cardiovascular pathology.

a. Snehana (Oleation Therapy) :

- Internal Oleation (Snehapana):
  - *Maha Tiktaka Ghrita* (medicated ghee) was administered orally in gradually increasing doses over 5 days. The ghrita formulation includes bitter herbs such as *Guduchi* and *Triphala*, which possess anti-inflammatory and detoxifying properties.
  - Purpose: To lubricate the channels (Srotas), soften accumulated toxins, and prepare the gastrointestinal tract for elimination.
- External Oleation (Abhyanga):
  - Daily full-body massage with warm *Bala-Ashwagandha Taila*, rich in cardiotonic and Vata-pacifying herbs.
  - Duration: 45 minutes
  - Benefits: Enhanced peripheral circulation, relief of stiffness, and calming of the nervous system.

b. Swedana (Sudation Therapy) :

- After Abhyanga, the patient received *Dashmoola* steam therapy for 15–20 minutes daily.
- *Dashmoola* (literally "ten roots") is a classical herbal decoction known for its anti-inflammatory and analgesic effects.
- Purpose: To induce mild sweating, facilitate toxin mobilization, and open microchannels.

2. Pradhanakarma (Main Detoxification Procedures) :

Panchakarma procedures aimed to eliminate the accumulated vitiated toxins and improve systemic circulation, especially benefiting cardiac tissue.

a. Virechana (Therapeutic Purgation) :

- Conducted on day 10 of therapy, after adequate Snehana and Swedana.
- The patient was administered *Trivrit Lehya* (a classical purgative herbal preparation containing *Operculina turpethum*), dosed carefully under medical supervision.
- The purgation induced moderate bowel movements over 6–7 hours.
- Purpose: To clear excess Pitta dosha, reduce systemic inflammation, and promote detoxification of the liver and gut, which are pivotal in cardiovascular health.

b. Basti (Medicated Enema Therapy) :

- Considered the most effective Panchakarma for Vata disorders, including cardiac Vata

imbalance manifesting as arrhythmias and contractile dysfunction.

- A total of 8 days of alternating *Niruha Basti* (decoction enema) and *Anuvasana Basti* (oil enema) were administered.

  ○ *Niruha Basti :*
  - Decoctions of *Dashmoola*, *Terminalia arjuna*, and *Guduchi* were used.
  - These herbs have demonstrated anti-inflammatory, antioxidant, and cardiotonic effects.
  - Volume: 500 ml, administered once daily.

  ○ *Anuvasana Basti :*
  - Medicated oil containing *Ashwagandha* and *Bala* was administered in 100 ml doses.
  - This nourishes and pacifies aggravated Vata, supports nervous system balance, and improves myocardial tone.
  - The Basti treatment was closely monitored for tolerance, and no adverse effects were noted.

3. Rasayana therapy (Rejuvenative and Supportive Care) :

Following the completion of Panchakarma detoxification, the patient was started on Rasayana therapy to strengthen cardiac tissue, improve metabolic function, and promote long-term health.

Oral Herbal Medications:

Sr.No	Medications	Dose	Route	Frequency	Uses
1	*Terminalia arjuna* (Arjuna Ksheerpaka):	10 gm	Orally	Twice a day	Known to improve myocardial contractility, reduce oxidative stress, and enhance coronary blood flow.
2	*Withania somnifera (Ashwagandha)* Root Powder:	3 gm	Orally	Twice a day	Acts as an adaptogen, reducing stress-induced myocardial damage and enhancing endurance.
3	*Tinospora cordifolia* (Guduchi):	1 gm	Orally	Twice a day	Exhibits immunomodulatory and anti-inflammatory properties.
4	*Abhrak Bhasma:*	125 mg	Orally	Twice a day	A classical Ayurvedic mineral preparation used to improve cardiac function and metabolic efficiency.

Dietary Recommendations :

- Increased intake of fresh fruits, whole grains, and herbal teas (*e.g., Arjuna* and *Tulsi* infusions).
- Avoidance of processed foods, excessive caffeine, and cold/raw foods.

Lifestyle Modifications and Supportive Measures :

- Yoga and pranayama:
  - Gentle postures targeting cardiovascular health like Tadasana, Vrikshasana and breathing exercises like *Nadi Shodhana* and *Bhramari* pranayama to improve autonomic balance and reduce stress.
- Meditation:
  - Daily guided meditation sessions to enhance emotional well-being and reduce anxiety.

4. *Safety and monitoring :*

- The patient's vital signs, blood sugar levels, and cardiac status were continuously monitored throughout therapy.
- Conventional cardiac medications were continued with no dosage changes, avoiding any potential herb-drug interactions.
- No adverse events such as hypotension, electrolyte imbalance, or gastrointestinal distress were observed.
- Weekly assessment included symptom evaluation, weight monitoring, and laboratory tests to ensure metabolic stability.

Following the completion of the 4-week inpatient *Panchakarma* protocol and subsequent 8 weeks of outpatient Rasayana therapy, the patient demonstrated notable improvements across clinical, functional, and echocardiographic parameters, while maintaining safety and good tolerability throughout the treatment period.

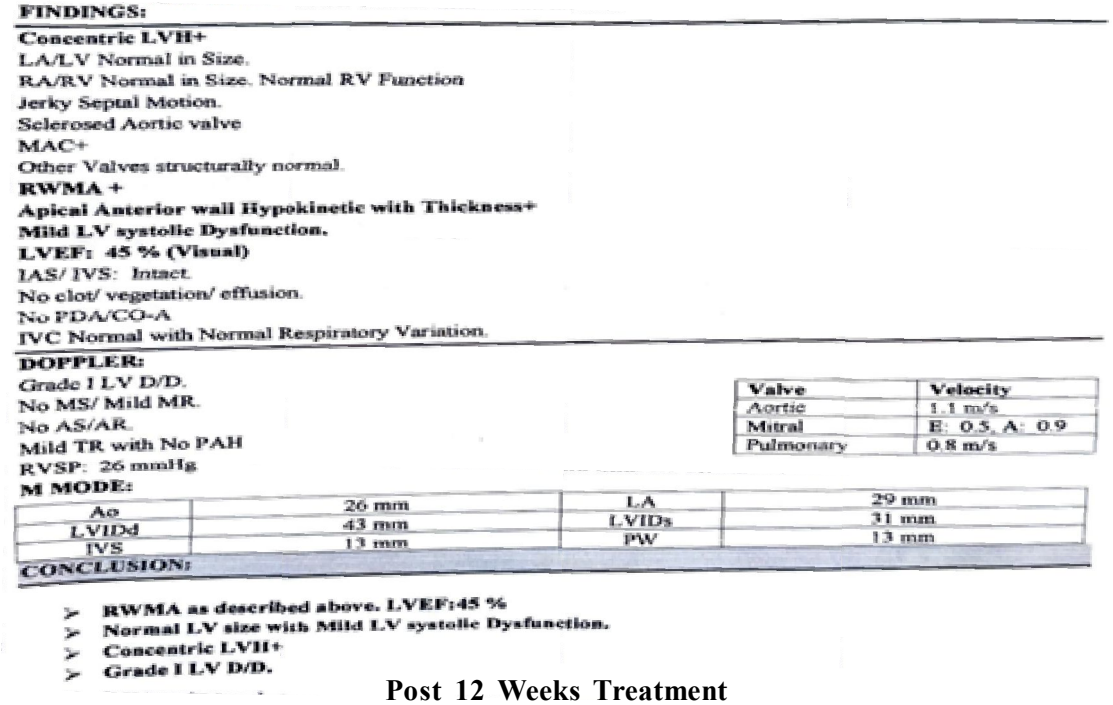
Clinical and symptomatic improvement:

- Symptom Relief:
  The patient reported a significant reduction in exertional dyspnea and fatigue.
- Exercise Tolerance:
  The 6-minute walk test distance increased markedly from 800 meters at baseline to 290 meters post-treatment. This nearly fourfold improvement reflected enhanced cardiac efficiency and reduced breathlessness on exertion.
- Edema and Fluid Status:
  Bilateral lower limb edema, previously graded as moderate (pitting +2), resolved completely by week 6, with sustained absence throughout follow-up.

Echocardiographic findings (March, 2025):

- Left Ventricular Ejection Fraction (LVEF):
  A follow-up transthoracic echocardiogram conducted 5 weeks after initiating *Panchakarma* showed an increase in LVEF from the baseline of 35% to 45 %. This 10% absolute improvement indicated a significant enhancement in global systolic function.
- Regional Wall Motion Abnormalities (RWMA):
  Baseline echocardiography had revealed territory akinetic with thickness consistent with prior anterior myocardial infarction. At follow-up, there was noticeable improvement in wall motion scores in these regions, with hypokinetic segments demonstrating improved contractility (apical anterior wall hypokinetic with mild thickness). This suggested potential myocardial recovery or positive ventricular remodeling.

- Left Ventricular Dimensions:
  There was a mild reduction in left ventricular end-diastolic and end-systolic diameters, consistent with reverse remodeling.
- Diastolic Function:
  Diastolic dysfunction grade improved from grade 2 to grade 1, indicating better ventricular relaxation and filling pressures.



FINDINGS:

Concentric LVH+
LA/LV Normal in Size.
RA/RV Normal in Size. Normal RV Function
Jerky Septal Motion.
Sclerosed Aortic valve
MAC+
Other Valves structurally normal.
RWMA +
Apical Anterior wall Hypokinetic with Thickness+
Mild LV systolic Dysfunction.
LVEF: 45 % (Visual)
IAS/ IVS: Intact.
No clot/ vegetation/ effusion.
No PDA/CO-A
IVC Normal with Normal Respiratory Variation.

DOPPLER:
Grade I LV D/D.
No MS/ Mild MR.
No AS/AR.
Mild TR with No PAH
RVSP: 26 mmHg

Valve	Velocity
Aortic	1.1 m/s
Mitral	E: 0.5, A: 0.9
Pulmonary	0.8 m/s

M MODE:

Ao	26 mm	LA	29 mm
LVIDd	43 mm	LVIDs	31 mm
IVS	13 mm	PW	13 mm

CONCLUSION:

- **RWMA as described above. LVEF:45 %**
- **Normal LV size with Mild LV systolic Dysfunction.**
- **Concentric LVH+**
- **Grade I LV D/D.**

Post 12 Weeks Treatment

Laboratory and Metabolic Parameters :

- Blood Pressure:
  The patient's blood pressure remained stable and well-controlled throughout treatment (average 130/80 mm Hg).
- Glycemic Control:
  Fasting blood glucose improved slightly to 115 mg/dL, and HbA1c decreased to 6.8%, reflecting better metabolic status, likely influenced by lifestyle changes and improved systemic health.
- Lipid Profile:
  Mild improvement was noted with LDL cholesterol decreasing to 95 mg/dL and triglycerides to 150 mg/dL.
- Renal Function and Electrolytes:
  Serum creatinine and potassium levels remained within normal limits, indicating preserved renal function and electrolyte balance despite the purgative therapy.

Safety and Tolerability :

- The patient tolerated all Panchakarma procedures well, including Virechana and Basti, with no reported adverse effects such as dehydration, hypotension, or gastrointestinal discomfort.
- No herb-drug interactions were observed,

and conventional cardiac medications were continued without dose adjustments.
- Regular monitoring ensured timely detection and management of any potential complications, none of which occurred.

This case study demonstrates a notable improvement in cardiac function in a patient with heart failure and reduced ejection fraction following a structured Panchakarma treatment regimen. The patient's LVEF increased from 35% to 45% over 12 weeks, alongside significant improvements in symptoms, exercise tolerance, anxiety levels, and overall quality of life. These outcomes suggest that Panchakarma, when appropriately tailored and supervised, may offer therapeutic value beyond symptom management—potentially supporting cardiac recovery and systemic rejuvenation.

While this is an individual case and cannot be generalized, it raises important considerations for the integration of traditional Ayurvedic practices with modern cardiology. The holistic nature of *Panchakarma* — addressing physical, mental, and emotional dimensions — may complement conventional heart failure treatments. However, larger-scale clinical studies are essential to scientifically validate these results, understand underlying mechanisms, and establish standardized protocols for integrative cardiac care.

Heart failure with reduced ejection fraction (HFrEF) is a chronic condition characterized by impaired myocardial contractility and reduced cardiac output, often leading to significant morbidity and mortality. In this case, a patient with an initial left ventricular ejection fraction (LVEF) of 35% showed a notable improvement to 45% following a structured Panchakarma treatment protocol. This positive outcome, though from a single case, raises important questions about the potential role of Ayurvedic interventions in supporting cardiac function alongside standard medical care.

Panchakarma is a classical Ayurvedic detoxification and rejuvenation therapy aimed at eliminating accumulated toxins (*ama*), restoring doshic balance, and improving systemic function. Its therapeutic actions are not only physical but also psycho-emotional, as seen in this patient's improvement in anxiety levels and quality of life. The use of therapies such as *Snehapana* (internal oleation) and Virechana (therapeutic purgation) has been shown to enhance digestive strength, reduce inflammatory markers, and improve metabolic regulation, which are relevant in the pathophysiology of heart failure[11]. *Basti* (medicated enema), particularly using formulations with *Dashamoola*, *Erandamoola*, or *Arjuna*, is considered to influence the *Vata dosha* — which in Ayurvedic cardiology is closely related to the functioning of the heart (*Hrudaya marma*) and circulation[12].

Recent research suggests that certain Ayurvedic herbs used in Panchakarma protocols, such as *Terminalia arjuna*, may have cardioprotective effects, including improved ventricular function, antioxidant activity, and endothelial support[3]. Additionally, the integration of breathing practices, mindfulness, and *Satvik* dietary recommendations may reduce sympathetic overdrive and improve parasympathetic tone — factors known to benefit cardiac patients by reducing heart rate, blood pressure, and stress-related inflammation.

Moreover, psychological stress is now

well recognized as a significant contributor to heart failure progression. The reduction in the patient's anxiety score (from 11 to 5 on the GAD-7 scale) suggests that Panchakarma's mind-body focus may play a supportive role in improving emotional resilience, which in turn positively affects cardiac outcomes. Improvement in physical functioning — evidenced by an increased 6-minute walk test distance from 80 meters to 290 meters — also supports the idea that Panchakarma may enhance exercise tolerance, likely by improving both cardiac efficiency and muscle metabolism.

However, this case study has limitations. It reflects an individual experience, lacks a control group, and cannot establish causality. The patient also continued conventional medications, so the improvement cannot be attributed solely to Panchakarma. Still, the holistic improvement observed points to the potential of an integrative approach — one that addresses not only the heart as an organ but the whole person, including mind, body, and lifestyle.

Larger clinical studies are needed to further explore the efficacy, safety, and mechanisms of Panchakarma in cardiac rehabilitation. Until then, this case provides a meaningful contribution to the growing interest in integrative cardiology and supports further collaboration between modern and traditional systems of medicine.

□ *Terminalia arjuna (Arjuna Ksheerpaka)– Cardioprotective & Myocardial Strengthening:*

Terminalia arjuna has been extensively studied for its cardioprotective effects. It contains bioactive compounds such as flavonoids, tannins, and glycosides, which have antioxidant, anti-ischemic, and myocardial strengthening properties. Studies have shown that Arjuna bark extract can improve left ventricular ejection fraction (LVEF), reduce angina episodes, and stabilize blood pressure and lipid profiles[3]. In this case, the use of *Arjuna Ksheerpaka* (decoction with milk) likely supported myocardial recovery by reducing oxidative stress and enhancing cardiac muscle tone.[11]

□ *Withania somnifera (Ashwagandha) – Adaptogen & Anti-Stress Agent :*

Withania somnifera, commonly known as Ashwagandha, is a powerful adaptogen that reduces psychological stress, anxiety, and cortisol levels — all of which are known to negatively affect cardiac function. Clinical trials have shown *Ashwagandha's* ability to reduce systolic blood pressure, improve VO2 max, and support heart rate variability, indicating improved autonomic balance[2]. In this patient, *Ashwagandha* likely contributed to the reduction in GAD-7 anxiety scores, better sleep, and improved parasympathetic tone — indirectly supporting improved heart function[12]

□ *Tinospora cordifolia (Guduchi) – Immunomodulator & Anti-inflammatory :*

Tinospora cordifolia (*Guduchi*) is revered for its immunomodulatory, hepatoprotective, and anti-inflammatory actions. Chronic inflammation plays a key role in heart failure progression. *Guduchi* may act by downregulating pro-inflammatory cytokines and enhancing mitochondrial function, which supports energy production in cardiac cells[10]. As part of this Rasayana protocol, *Guduchi* likely helped

reduce systemic inflammation, contributing to the patient's improved energy levels and cardiac efficiency.[13]

□ *Abhrak Bhasma – Rasayana & Mitochondrial Support :*

Abhrak Bhasma is a classical Ayurvedic preparation made from purified mica, known for its deep *Rasayana* properties. It is traditionally used to rejuvenate majja (nervous system) and shukra (reproductive system) dhatus, but also has reported effects on cardiac strength, respiratory capacity, and tissue regeneration. Preclinical studies suggest it enhances mitochondrial enzyme activity, promotes hemopoiesis, and supports tissue oxygenation — all essential in improving the performance of a failing heart[7]. In this case, Abhrak Bhasma may have played a synergistic role in boosting cellular vitality and aiding myocardial recovery.[10]

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