

# Impact of integrative therapy in remission of Multiple Myeloma: A case study

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## KEY WORDS

Multiple Myeloma  
Stage 3  
Fatigness  
Bone pain  
Lower back pain  
Yoga therapy  
Naturopathy  
Ayurveda  
Quality of life

## ABSTRACT

The present case is of Multiple Myeloma who visited Arogyadhama (SVYASA University, Bangalore) patient's name is Mr. XXX 65 years old. In March 2019, he was admitted to arogyadhama with a diagnosis of Multiple Myeloma Stage 3 and briefed his medical history as reported to the physician on the first time with a chief complaint of severe pain in the right scapula and mid/lower back. On the advice of the orthopedist, he undertook an MRI of the backbone and a PET CT Scan. Reports revealed lesions in the vertebrae, right scapula, and other skeletal structures. Blood work: CBC, Serum Protein Electrophoresis, Free light chain, Bone marrow, etc showed very high values of Monoclonal Protein, Plasma cells, low Hb, low Albumin, etc. And as per the reports and markers condition was diagnosed as Multiple Myeloma Stage 3. The patient consulted an Oncologist at Cytecare Cancer Hospital, Yelahanka, Bangalore. And treatment commenced for 24 weeks involving Immunotherapy drugs, steroids, bone-strengthening injections, etc. Post this 24 weeks treatment, he was in remission with a maintenance drug. In Dec 2019, he consulted in Arogyadhama and briefed the physician about the diagnosis of Multiple Myeloma and the treatment received. On the physician's suggestion, the patient enrolled himself for Integrative Therapy at SVYASA and received treatment involving various Yoga, Naturopathy, Ayurveda, and Diet therapy techniques for 27 days and followed the same protocol for a year and was successfully able to achieve positive results in the condition.

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## Introduction

Multiple myeloma (MM) is an incurable, biologically heterogeneous disease of uncontrolled development of monoclonal plasma cells in the bone marrow that prompts the overproduction of nonfunctional unblemished immunoglobulin chains.

The gathering of these immunoglobulin's and collaboration of the unusual monoclonal plasma cells with different cells in the bone marrow lead to a large group of issues including anemia, bone lesions, infections, hypocalcemia, renal failure, fatigue, and pain (1). Multiple myeloma (MM), also known as plasma cell myeloma and Simple myeloma, a cancerous condition in which plasma cells are involved, in which normally white blood cells produce antibodies (2). Often, there were no symptoms are noticed initially. As it progresses, bone pain, anemia, kidney dysfunction, and infections may occur. Complications may include amyloidosis (3).

### *Causes and risk factors*

The cause of multiple myeloma is unknown (4). Risk factors include obesity, radiation exposure, family history, and certain chemicals (3).

World Health Organization grouping framework separates MM from other plasma cell issues like monoclonal gammopathy of dubious importance (MGUS), singular

plasmacytoma of the bone, extraosseous plasmacytoma, and monoclonal immunoglobulin affidavit sicknesses (5).

MM is the second most common hematologic malignancy. The American Cancer Society predicts there will be 30,280 new MM analyzed and 12,590 passing identified with the infection in the United States in 2017 (6).

### *Prevalence*

Worldwide, multiple myeloma influenced 488,000 individuals and brought about 101,100 passing in 2012 (7,8). In the United States, it creates in 6.5 per 100,000 individuals each year and 0.7% of individuals are influenced sooner or later in their lives (9). It has been estimated that in 2012, 89,658 people were living with MM (10). The risk of developing MM is higher in older age groups, whereas it is a much more uncommon diagnosis for patients under the age of 4 years 5 (11). The median age at diagnosis is 65 years and the current 5-year survival is approximately 46.6% (10). It usually occurs around the age of 60 and is more common in men than women (2).

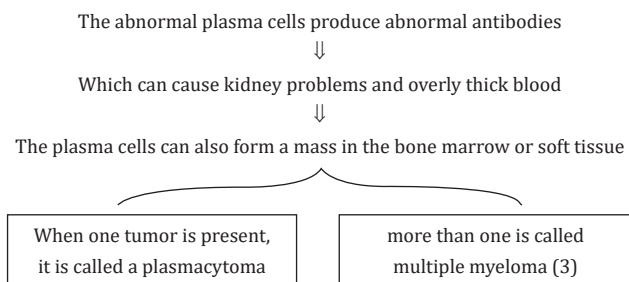
### *Sign and symptoms*

Since numerous organs can be influenced by myeloma, the indications and signs vary greatly. Fatigue and bone pain are the most common symptoms at presentation. The CRAB criteria encompass the most common signs of multiple myeloma (12).

- Calcium: serum calcium >0.25 mmol/l (>1 mg/dl) higher than the upper limit of normal or >2.75 mmol/l (>11 mg/dl)
- Renal insufficiency: Creatinine clearance <40 ml per minute or serum creatinine >1.77 mol/l (>2 mg/dl)
- Anemia: hemoglobin value of >2 g/dl below the lowest limit of normal, or a hemoglobin value <10 g/dl
- Bone lesions: one or more osteolytic lesions on skeletal radiography, CT, or PET/CT

### Pathogenesis

Multiple myeloma may develop from monoclonal gammopathy of undetermined significance that progresses to smoldering myeloma (13).



### Diagnosis

Multiple myeloma is analyzed dependent on blood or Urine tests discovering unusual antibodies, bone marrow biopsy discovering harmful plasma cells, and clinical imaging discovering bone sores. Another normal finding is high blood calcium levels (2). Multiple myeloma is considered treatable, but generally incurable (3).

Reductions might be achieved with steroids, chemotherapy, directed treatment, and undifferentiated organism relocation. Bisphosphonates and radiation treatment are now and then used to decrease pain from bone injuries (2).

### Role of yoga in cancer

A few variables assume a part at the beginning of malignancy. Expanding significance is being given to aggravation. While acute inflammation is healing and beneficial, chronic inflammation has the opposite effect. Chronic inflammation triggers NF-kappa-B (NFkB), the protein complex which influences DNA transcription among other functions. NFkB activates a pathway resulting in the expression of pro-inflammatory genes such as cytokines, adhesions molecules, and other chemicals. At this stage, there is sure proof that yoga and positive changes in one's way of life can switch this cycle.

### Stress and cancer

Stress associated with diagnosis and treatment of cancer affects not only quality of life but leads also to poorer

prognosis and shorter survival. Adverse effects of stress on prognosis occur through the following mechanisms:

1. Suppression of natural killer (NK) cells and their cytotoxicity.
2. Poor repair of damaged DNA.
3. Modulation of apoptosis and Oxidative stress: aggravated by psychological stress. NK cell activity increases by relaxation methods. Patients with malignant melanoma (Skin cancer), who underwent a relaxation program for 6 weeks had a significant increase in the percentage of NK cells, as well as an increase in NK cell cytotoxicity, as also lower rates of recurrence and death. Similarly, supportive group relaxation methods led to longer survival and better quality of life among women with advanced breast cancer. Yoga, meditation, and pranayama are centuries-old processes; known to relax the mind and energize the body. SK Yoga, a rhythmic breathing process, introduced by Sri Sri Ravishankar Ji, is known to eliminate stress, anxiety, and depression and increase enthusiasm. Fall in blood lactate, increase in glutathione, superoxide Dismutase (SOD) and catalase, and increase in natural killer (NK) cells indicate relaxation, better antioxidant, and better immune effects of SKY in normal individuals and those with cancer. Further confirmation of better antioxidant defense was available through studies conducted using reverse transcriptase-polymerase chain reaction (RT-PCR), at AIIMS. This was accompanied by better stress regulation and better immune status due to the prolonged life span of lymphocytes by up-regulation of antiapoptotic genes and pro-survival genes. Qu et al observed a rapid and significantly greater effect of SKY on gene expression in peripheral blood mononuclear cells (PBMNs). Other positive effects of SKY included a reduction in tobacco addiction and reduction in side effects of chemotherapy. Hence, SKY appears useful adjunct to cancer management.

### Case presentation

A 65 years old male participant, Mrs. XXX enrolled as a participant in Prashanti Kutiram (Arogyadhama) in December 2019, and Intervention (Integrated protocol for Oncology) has been given for about 27 days and the study had been followed up for 1 year.

### Yoga therapy protocol (14)

	Rounds	Session per day
<b>1. Loosening Practice (15, 16)</b>		
Hand Stretch Breathing.	10	Twice a day
Hands in & out Breathing in sitting Position.	10	Twice a day
Ankle Stretch Breathing in sitting position.	10	Twice a day

Tiger Breathing	10	Twice a day
Straight leg raising alternate leg.	10	Twice a day
<i>Setubandhasana Breathing.</i>	10	Twice a day
<i>Folded leg lumber stretch.</i>	10	Twice a day
<i>Bhujangasana Breathing</i>	10	Twice a day
<b>2. Shakti vikasaka practice (17,18)</b>		
ManibandhaSakitVikasaka (Wrists)	10	Twice a day
<i>KaraprastaAaktiVikasaka (Back of Hand)</i>	10	Twice a day
<i>Kaphonoi Sakti Vikasaka (Elbows)</i>	10	Twice a day
<i>Griva Sakti Vikasaka (Neck)</i>	10	Twice a day
<b>3. Pranayama (19)</b>		
<i>Sectional Breathing</i>	15	Once in a day
<i>SuryanulomaVilama</i>	15	Once in a day
<i>Cooling Pranayama</i>	9	Once in a day
<i>Nadisuddhi</i>	15	Once in a day
<i>ChandranulomaVilama</i>	15	Once in a day
<i>Bhamari</i>	9	Once in a day
<b>4. Kriya (20)</b>		
<i>Kapalabhati.</i>	1 min	Once in a day
<b>5. Meditation</b>		
OM Meditation (21)	35 min	Once in a day
Cyclic Meditation (22)	30 min	Once in a day
Mind sound resonance technique (21)	30 min	Once in a day
Pranic Energising Techniques (23)	45 min	Once in a day
Steps of Pranic Energising Techniques: The following are the eight steps of Pranic Energising Techniques 1. Opening prayer "prāēasyedaà vaçe sarvaà ..." 2. Breath Awareness or Balancing of Breath 3. Recognition of Vyana 4. Movement and Rotation of Vyana 5. Balancing and Energisation 6. Silence 7. Resolve ... 9 rounds 8. Closing prayer "serve bhavantu ..."		

### Ayurveda protocol

Internal	Ashwagandha vati Haridra	1-0-1 1-0-1
External	Mrudu abhangyam Shirdhara	1-0-1 1-0-1

### Naturopathy protocol

Days	7:00 am	2:00 pm
Saturday	Mud pack to the abdomen and eye pack + Neutral Enema	Head massage + Neutral foot bath

Days	7:00 am	2:00 pm
Sunday	Kriya	Partial massage to shoulder, Neck, and Back + Hot fomentation to back
Monday	Mud pack to the abdomen and eye pack	Neutral Underwater massage
Tuesday	Mud pack to the abdomen and eye pack	Full body massage + Steam bath
Wednesday	Mud pack to the abdomen and eye pack	Partial massage to legs and hot foot bath
Thursday	Mud pack to the abdomen and eye pack	Neutral underwater massage

### Diet plan

	Breakfast (8:00 am)	Juice	Lunch (1:00 pm)	Dinner (7:30 pm)
Friday	Khichadi/	Sprout juice	1 chapati + 1 cup dal + 1 cup rice	1 chapati + 1 cup dal + 1 cup rice
Saturday	Daliya	Sprout juice	+ 100 gm	+ 100 gm
Sunday	Poha/ Boiled	Sprout juice	+ 100 gm	+ 100 gm
Monday	Sprouts/ Upma	Sprout juice	boiled veg + Butter milk with	boiled veg + Vegetable soup/
Tuesday	Veg	Sprout juice	jeera powder	Buttermilk with jeera powder
Wednesday	khichadi/	Sprout juice		
Thursday	Daliya	Sprout juice		

#### Organic sprout juice (24) Recipe:

##### Introduction:

Sprouts are considered a nutritious intake as the sprouting process increases nutrient levels, making sprouts richer in protein, folate, magnesium, and vitamins C and K than un-sprouted plants. Sprouts also contain a level of anti-nutrients which makes absorption easier. Sprouts are also great sources of antioxidants and fiber.

##### Benefits:

Ease Digestive function  
All nutrients get absorbed soon.  
Good for Weight gain  
Reduce oxidative stress

##### Nutritional values:

Protein	<ul style="list-style-type: none"> <li>Enhanced cell growth and repair</li> <li>Improvements in blood clotting and infection-fighting.</li> </ul>
Folate	<ul style="list-style-type: none"> <li>Plays a key role in DNA synthesis, repair, and methylation.</li> </ul>
Magnesium	<ul style="list-style-type: none"> <li>Maintain magnesium homeostasis.</li> <li>Protective agent against chemotherapy-induced nephrotoxicity and neurotoxicity.</li> </ul>
Vitamin C	<ul style="list-style-type: none"> <li>Block the metabolic activation of carcinogens</li> <li>Stimulate immune function</li> <li>Effective against oxidative stress.</li> </ul>
Vitamin K	<ul style="list-style-type: none"> <li>Inhibit cancer cell growth and promote apoptosis</li> </ul>
Fiber	<ul style="list-style-type: none"> <li>Flushing cancer-causing compounds out of the body.</li> </ul>

Ingredients:		
	Ingredient	Quantity
1	Javegodhi (native wheat)	1 kg
2	Unpolished rice	1 kg
3	Foxtail	1 kg
4	Little millet	1 kg
5	Ragi	1 kg
6	Green gram	150 g
7	Bengal gram	100 g
8	Horse gram	100 g
9	Alfalfa	100 g
10	Groundnut	100 g
11	Black-eyed peas(alasand)	100 g
12	Peas	100 g
13	Broad beans	100 g
14	Amaranth seeds(not sprouted)	100 g

**Preparatory procedure:**

- Take all grains and mix in well in a container
- Make it small quantity of it for daily use (use a standard cup measurement)
- Whenever you are taking for preparation first wash properly
- soaked for 12 hours and sprouted for 12 hours
- Soak nuts, seeds, dry fruits 12 hours

**Preparation of juice:**

- Grind sprouts and (nuts, seeds & dry fruits) separately.
- Bring it to a thin consistency and bring it to a boil to make kanji.
- Now add ground nuts, seeds, and dry fruits.
- Mix & serve.

**Dose:** Three times/meals per day (Approximately 60 g (sprouted grains) quantity per meal)

**Anupan (take juice with the following anyone)**

Milk
Jaggary/Honey
Rock salt/Black pepper/Jeera powder
Ghee

*Subjective symptoms*

Symptoms	Pre	Post
Acute pain in the Right shoulder.	Present	Absent
Acute lower back pain occurred.		
Difficulty in walking/movement.		
Nausea, stomach upset, frequent vomiting.		
Loss of appetite.		
Pneumonia.		
Extreme fatigue.		
Deep Venous Thrombosis.		
Prone to viral infections		
Pain scale	8	0

*Key parameters reading*

Key parameters	April 2019	April 2019–Jan 2020 (after 24 weeks of medication + chemotherapy)	Sep 2020	Sep 2021
<b>serum protein electrophoresis (SPE)</b>	4.8% g/dl	0.26% g/dl (Jan 2020)	0.51% g/dl	No monoclonal band seen
<b>Free light chain</b>	Kappa Light chain: 127.0 mg/L Lambda light chain: 10.5 mg/L Kappa/Lambda Ratio: 12.0952	Kappa Light chain: 31.3 mg/L Lambda light chain: 26.9 mg/L Kappa/Lambda Ratio: 1.16 (Jan 2020)	Kappa Light chain: 25.70 mg/L Lambda Light chain: 21.70 mg/L Kappa/Lambda Ratio: 1.184	Kappa Light chain: 13.8 mg/L Lambda Light chain: 14.4 mg/L Kappa/Lambda Ratio: 0.95
<b>Bone marrow</b>	50% plasma cells	1% plasma cells (August 2019)	4% plasma cells	NIL
<b>PET CT</b>	1. Known case of multiple myeloma 2. Multiple metabolically active skeletal lesions. 3. The collapse in D10, L4 vertebra. And activity in the Right Scapula, Sternum, Sacrum, neck of the left Femur.	1. Multiple osteolytic lesions in the skeletal system with mild-to-moderate metabolic activity, suggestive of residual multiple myeloma.	1. Significant increase in the area of lysis and associated soft tissue component of size 4.0 × 2.2 involving the inferior Right scapula with a marked increase in metabolism.	1. Marked regression in metabolism. Of inferior right scapular osteolytic region. 2. Further regression in the metabolism of some of the multiple Osteolytic lesions in the skeleton system.

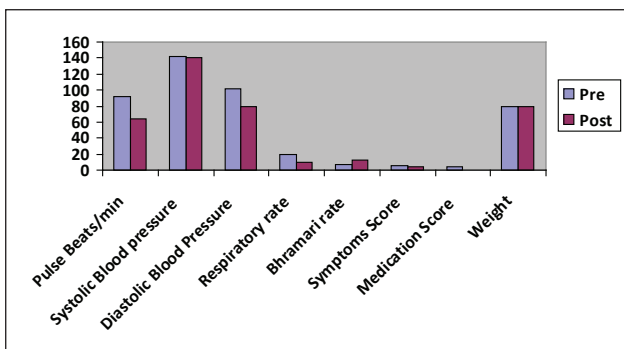
Key parameters	April 2019	April 2019–Jan 2020 (after 24 weeks of medication + chemotherapy)	Sep 2020	Sep 2021
	4. No evidence of active disease is seen elsewhere in the body to suggest active disease.	2. Regarding PET CT done in April 2019, there is mild-moderate regression of metabolic activity in skeletal lesions, suggesting partial response. (August 2019)	2. Multiple osteolytic lesions in the skeletal system with interval regression in metabolism. 3. No morphological change was noted associated with the partially collapsed body of the L4 vertebra with an interval increase in metabolism.	3. Stable partially collapsed body of L4 vertebra.
<b>Deep vein thrombosis (DVT) Left lower limb</b>			Persistent left lower limb DVT involving mild & distal SFV with intense appearance of unstable partially occlusive floating thrombus in proximal SFV.	1. Complete recanalization of mid-distal superficial vein and saphenous vein 2. No evidence of deep/superficial 3. Venous thrombosis.

*Vital parameters pre and post reading*

Parameters	Before (18th Oct 2019)	After (14th Nov 2019)
Pulse Beats/min	92 bpm	64 bpm
BP in mmHg	142/102	140/80
Respiratory Cycles/min	20 cpm	10
Bhramari Time (Sec)	7	12
Symptoms score	6	4
Medication score*	04	00
Weight in Kg	80	80

**\*In Remission undergoing maintenance medicines during chemotherapy and after chemotherapy:**

Pomalidomide: 2 mg: PO: 21/28 daycycle  
Asprin: 75 mg: 21/28 daycycle  
Zolendronic Acid: 4 mg: IV infusion: Monthly



**Positive results of Integrative treatment, in particular, are:**

- Medication has been stopped since Feb 2021.
- Pain in the shoulder & lower back is also reduced.
- Deep Vein Thrombosis in the lower limb has been completely resolved.

Key parameters have shown significant improvement towards normalcy.

**Discussion**

Yoga is a mind-body therapy that includes three components: (1) physical alignment poses (asanas), breathing techniques (pranayamas), and mindful exercises (meditations). Integrated Approach (Yoga, Ayurveda, Naturopathy) is positively effected in Myeloma condition with positive changes in key parameters like SPE (serum protein electrophoresis), Free light chain and PET CT. Deep vein thrombosis is one of the complications of chemotherapy in this case integrative therapy has a proven to reduce signs of the same, complaints with severe scapular pain and mid back pain as well as a participant is relieved from fatigue too, Integrative Therapy significantly gives an improvement in day to day activity like performing own work and daily routine, Participant was not depended on any assist activity these give confidence and Courage in Day to day activity, On the physical level, it gives a remarkable improvement, as well as mental health, gets better day by day, Vital parameters are also showing a positive changes and Medication has stopped completely. As part of the Cause, the stress factor plays a vital role in the cancerous condition, Integrative therapy also worked to reduce oxidative stress as well as in Inflammatory markers. Integrative medicine has proven to reduce chemotherapy side effects yoga practice is also positively effective in reducing chemotherapy side effects. Integrative medicine has an impact on all aspects of health like Mental, physical, social as well as spiritual levels.

**Conclusion**

Integrative therapy was found to be positively affected in remission on condition and symptomatic relives as well as stress condition. Integrative therapy helps to reduce chemotherapy side effect. The treatment helped to maintain a good quality of life if the practice is regular and continuous.



## Limitation

It's a single case study, For future study Randomised control trial with longer sample size is needed and a Mechanism action study to rule of the mode of action of yoga therapy in Multiple Myeloma.

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## Authorship contribution

Dr. Reshma P. Jogdand has written an article.

Dr. Amit Singh and Dr. Nagarathna R-Treatment protocol making and guided to write an article.

Dr. Umashankar and Mr. Parmeshawar have contributed to a treatment Application and planning.

## Informed consent

Yes.

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## Conflict of interest

Nil.

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