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Holistic Management of Compression Fracture of Vertebral Body: A Comprehensive Approach in Conjugation with mild diffused Osteoporosis: A Case Report

Shravani U. Mahajan, [1*] Digvijay T. Patil, [2] Charmi Mehta, [3] Dhananjay V. Patel [4]

[1] 2nd year MD Scholar, [2] 3rd year MD Scholar, [3]Assistant Professor, [4] Associate Professor, Department of Kayachikitsa, Institute of Teaching and Research in Ayurveda (ITRA), Jamnagar, Gujarat, India.

ABSTRACT:

Among osteoporotic fractures, vertebral fractures are most prevalent, especially in older individuals and more common in women due to lower bone mineral density. These fractures cause intense discomfort, impaired activity, loss of autonomy, and markedly worsened quality of life. In Ayurveda, the condition is identical to *Katishoola,* one of the eighty forms of *Nanatmaja Vata Vyadhi* mentioned by *Acharya Charaka*. In the present study, a 52-year-old patient had complaints of an unbearable shooting type of pain in the lower back region along with a tingling sensation and weakness in bilateral lower limbs. Pain gets aggravated on movements like bending or twisting. An X-ray of the lumbosacral spine revealed a compression fracture of the L2 vertebral body. The patient was managed with *Kati Basti, Matra Basti, Shaman Aushadhi* (oral Ayurvedic medications), and *Shaman Snehapana*. After treatment, there was a significant reduction in pain assessed by the Visual Analog Score (VAS), improvement in the Straight leg raising test, Oswestry low back pain index, and the low back outcome score (LBOS). This case report focuses on the effectiveness of Ayurvedic intervention in compression fracture of the vertebral body with mild osteoporosis, thereby preventing surgical intervention.

KEYWORDS: *Kati Basti*, *Katishoola, Matra Basti,* Osteoporosis, Vertebral Compression fracture.

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***Corresponding Author:**

Dr. Shravani U. Mahajan

2nd year MD Scholar, Department of Kayachikitsa, Institute of Teaching and Research in Ayurveda (ITRA), Jamnagar, Gujarat, India.

Email: shravani12mahajan@gmail.com

INTRODUCTION:

A fracture is usually caused by trauma, overuse, or conditions that weaken the bones like osteoporosis. Vertebral fractures are the most severe and life-threatening of all bone fractures.[1] The vertebral compression fracture, also known as a burst fracture, usually caused by sudden trauma or a fall, clinically shows numbness, tingling sensation and weakness at lower limbs or occasionally loss of bowel and bladder control if there is involvement of spinal cord injury. Age is a major risk factor for vertebral fractures, with the prevalence rising from around 3% in those under 60 to about 20% in people 70 and beyond.[2]

The low back pain (*Katishoola*) occurs mainly in two forms- specific and non-specific. In 90% of instances, a cause has not been identified, but in 10%, identifiable causes occur, like fracture and infection.[3] Additionally, the probability of consecutive and other osteoporotic fractures is significantly elevated by a single vertebral fracture, which underscores the necessity of prompt diagnosis and treatment.[4] In contemporary medicine, fractures are managed by conservative and surgical intervention but possess potential complications. Since it is generally accepted that Ayurvedic fracture treatment holds promising results, herbs promote bone growth at the fracture site. *Katishoola* constitutes *Katipradeshi Vedana* (pain at lower back), *Kati Shunyata* (numbness at lower back) and *Hasta-Pada Suptata* (numbness at limbs).[5] This present study attempts to assess the efficiency of Ayurvedic treatment for vertebral compression fracture emphasizing on alleviating *Vata*, promoting bone growth, and relieving the symptoms.

PATIENT INFORMATION:

A female patient, age 52 years, visited in the Out-Patient Department (OPD) for complaints of an unbearable shooting type of pain in the lower back region along with a tingling sensation and weakness in bilateral lower limbs from last 1.5 months, which flare up on movements like bending or twisting. The pain was so severe that she was unable to walk 100 meters without support and also had disturbance in sleep. The patient had a history of a road traffic accident (RTA), which resulted in a fall on the lower back before 1.5 months. Patient sought allopathic management; NSAIDs and calcium supplements were prescribed but gave temporary relief only. An X-ray of lumbosacral spine revealed a compression fracture through the superior endplate of the L2 vertebral body with mild diffuse osteoporosis. She had no issue with bladder and bowel control. The pain rated 7/10 assessed by the VAS score, and locally tenderness noted at the L1, L2, and L3 paraspinal muscles. She was advised to have surgery, as the condition was deteriorating day by day, but the patient was not willing for it. Therefore, she was admitted for further Ayurvedic management.

Past history

The patient had no significant medical history or surgical history related to the present condition. None of the family members had any genetic disease.

Personal history

The patient was on the vegetarian diet. The bowel was cleared once or twice a day, but was unsatisfactory with hard stool (occasionally) and micturition was regular. The appetite of the patient was average. The sleep was disturbed (due to severity of pain) and no day sleep present. No any history of allergy or addiction.

Clinical finding

The general condition of the patient was anxious, with blood pressure 110/70 mm of Hg and pulse rate 78 beats/minute, regular, full in volume while respiratory rate was 18 per minute. On clinical examination, pallor, icterus, clubbing, cyanosis, lymphadenopathy and oedema was absent. The BMI was 18.3 kg/m^2.

Examination of locomotor system

- Gait: Unable to walk 100 m without support
- Arms: All movements achieved fully
- Legs: SLR test: Right leg- 20 degree, Left leg- 30 degree
- Spine: Tenderness present at L1, L2 and L3 paraspinal muscles
  Restricted movement on bending forward and on twisting.

Laboratory investigations

The patient was investigated on 16 January 2024 after admission and all haematological and biochemical findings like blood glucose level, lipid profile, hepatic and renal profile were under normal range except ESR value of 38 mm/hr.

X-ray of LS spine (anteroposterior (AP) and lateral view)

The previous X-ray report revealed a minimally depressed fracture through the superior endplate of the L2 vertebral body. Mild diffuse osteoporosis is noted in visualized bones, dated on 30 November 2023.

THERAPEUTIC INTERVENTION:

During IPD stay, the patient was initially treated with *Kati Basti* for 15 days and *Matra Basti* for next 15 days along with *Shaman Aushadhi* (oral Ayurvedic medications), for alleviating *Vata*, promoting bone growth and relieving the symptoms. She was advised to put on lumbosacral belt as a support to lower back while doing activities. On discharge, *Shaman Snehapana* was advised along with oral Ayurvedic medications for one month, detailed in table-1.

Outcomes Measures:

After the course of treatment, the patient got moderate improvement in overall symptoms and was discharged. During discharge, *Shaman Snehapana* and oral Ayurvedic medicine were continued for one month with consistent weekly monitoring. After two months, there was a significant reduction in pain assessed by the Visual Analog Score (VAS), before treatment (VAS-07) to after treatment (VAS-03)[Table 2] and also improvement in the straight leg raising test from 20 degrees to 50 degrees in the right leg and from 30 degrees to 65 degrees in the left leg[Table 3]. There was also marked improvement in the Oswestry low back pain index, from 58% before treatment to 26% after treatment[Table 4] and Low Back Outcome Score (LBOS), from 22 (poor status) before treatment to 49 (fair status)[Table 5]. Before treatment, the patient was unable to walk 100 m without support, while after treatment was able to walk more than 500 m without support.

The previous X-ray of the lumbosacral spine (AP and lateral view) report revealed a minimally depressed fracture through the superior endplate of the L2 vertebral body. Mild diffuse osteoporosis is noted in visualized bones, dated on 30 November 2023 (Image1,2). After 2 months of treatment, a repeated X-ray was done, which revealed no clearly definable depression through the superior endplate of the L2 vertebral body-likely healed. Mild diffuse osteoporosis is noted in visualized bones, dated on 21 March 2024 (Image 3,4).

Table-1: Timeline of study

Date	Treatment Plan	Medicines used
16 Jan 2024 to 30 Jan 2024 (15 days)	*Kati Basti* and *Shaman Aushadhi* (oral medications)	1.*Kati Basti* with *Murivenna Taila* 2.*Dashmoola Kwatha*-40 ml, twice a day, empty stomach 3.*Lakshadi Guggulu*, 2 tablets, each of 500 mg, twice a day, after meal with lukewarm water
31 Jan 2024 to 14 Feb 2024 (15 days)	*Matra Basti* and *Shaman Aushadhi* (oral medications)	1.*Matra Basti* with *Guggulutiktaka Ghrita-50 ml, Gandha Taila-10 ml* 2.*Dashmoola Kwatha*-40 ml, twice a day, empty stomach 3.*Lakshadi Guggulu*, 2 tablets, each of 500 mg, twice a day, after meal with lukewarm water
15 Feb 2024	Patient was discharged from hospital.	1.*Shaman Snehapana* with *Asthishrinkhala Ghrita-10 ml,* in morning empty stomach 2.*Dashmoola Kwatha*-40 ml, twice a day, empty stomach 3.*Lakshadi Guggulu*, 2 tablets, each of 500 mg, twice a day, after meal with lukewarm water
Follow Up 1 24 Feb 2024	*Shaman Snehapana* and oral ayurvedic medications	Same medications were continued as mentioned above.
Follow Up 2 03 March 24		
Follow Up 3 10 March 24		
Follow Up 4 17 March 24		

Table-2: Visual Analog Score (VAS)

	16/01/2024 (BT)	**17/03/2024 (AT)**	**15/08/2024 (After 5 months)**
Score(0 to 10)	07	03	01

Table-3: Straight Leg Raising Test (SLR Test)

	16/01/2024 (BT)	**17/03/2024 (AT)**	**15/08/2024 (After 5 months)**
Right Leg	20	50	60
Left Leg	30	65	70

Table-4: Oswestry low back pain index

Score	16/01/2024 (BT)	17/03/2024 (AT)	15/08/2024 (After 5 months)
0-20% minimal disability 21-40% moderate disability 41-60% severe disability 61-80% crippled disability 81-100%	58% (Severe disability)	26% (Moderate disability)	18% (Minimal disability)

Table-5: Low Back Outcome Score (LBOS)

Score	16/01/2024 (BT)	17/03/2024 (AT)	15/08/2024 (After 5 months)
≥ 65 scoring (Excellent status) 50-64 scoring (Good status) 30-49 scoring (Fair status) 0-29 scoring (Poor status)	22 (Poor status)	49 (Fair status)	65 (Good status)

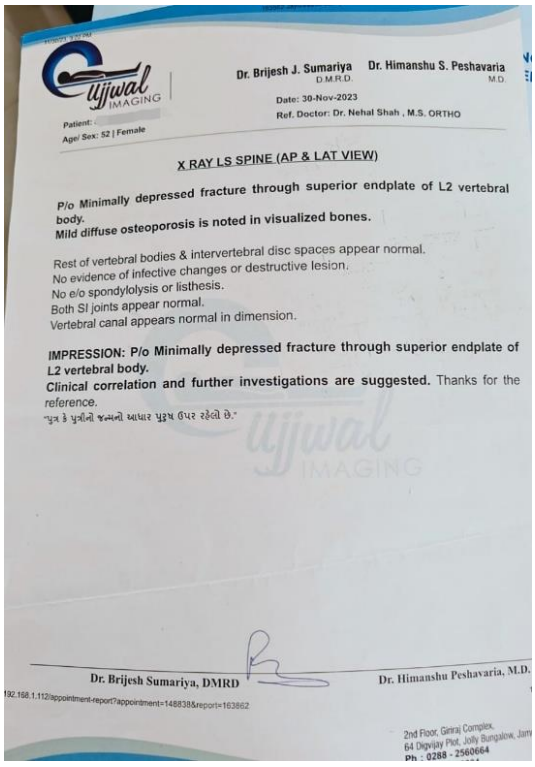

Image 1 and 2: Xray- LS spine (AP and Lat view) on 30-Nov-2023

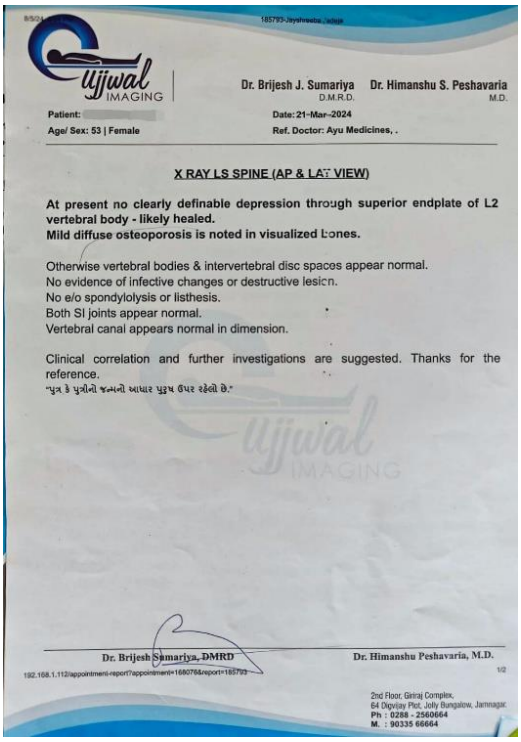

Image 3 and 4: Xray- LS spine (AP and Lat view) on 21-Mar-2024

DISCUSSION:

Postmenopausal osteoporosis is a prevalent disorder that increases the risk of fractures by weakening bones as a result of estrogen shortage after menopause. In Ayurveda, the condition is identical to *Katishoola,* one of the eighty forms of *Nanatmaja Vata Vyadhi* mentioned by *Acharya Charaka*.[6]

In the present case, as a result of the fall and *Dhatu Kshaya,* vitiation of *Vata Dosha* occurs so locally *Snehana* by *Kati Basti* and internally by *Matra Basti,* followed by *Shaman Snehapana* and *Swedan,* were adopted to manage the movement of *Vata Dosha* and provide strength to *Kati pradesha*. *Kati Basti* improves blood flow to the lumbosacral region and aids with the removal of biochemicals that cause pain as well as strengthens the back muscles. *Murivenna Taila*, a local application, is prescribed for fracture, dislocation, sprain, osteoarthritis, etc., showing anti-inflammatory and wound-healing properties.[7] *Basti* is considered a prime treatment modality for all kinds of *Vata Vyadhi*.[8] *Matra Basti* is a type of *Sneha Basti*; it is particularly indicated in *Vata Vyadhi* caused due to *Dhatu Kshaya* and for *Bala Vriddhi* where the *Brimhana* effect is expected. As the treatment principle of *Asthi Dhatu Dushti* is administration of *Basti* made up of *Tikta Dravya, Kshira,* or *Ghrita*, hence *Guggulutiktaka Ghrita* was selected. *Tikta Rasa,* having *Vayu* and *Akash Mahabhuta* dominance, has affinity towards *Asthi Dhatu*, as it is also having the same, *Vayu* and *Akash Mahabhuta* dominance. *Guggulutiktaka Ghrita* is described under *Vata Vyadhi Adhikara* for the treatment of *Sandhigata Vata* having a predominance of *Tikta Rasa* and *Ushna Virya* which facilitates an increase in *Dhatavagni,* preventing degenerative changes in the body.[9] *Gandha Taila,* mentioned in *Bhagna Chikitsa*, contains mainly cow milk and *Tila* (sesame). It has properties like *Asthidhatu Vriddhi, Vatahara,* and *Brimhana.*[10] In postmenopausal women, the decrease of estrogen causes osteoporosis, and *Gandha Taila* helps in

preventing these symptoms, thereby nourishing *Asthi Dhatu*.

As *Asthishrinkhala* (*Cissus Quadrangularis*) possesses properties to facilitate bone fracture healing by accelerating the proliferative physiological process in the bone, it strengthens bones, joints, ligaments and muscles,[11] so *Asthishrinkhala Ghrita* was administered as *Shaman Snehapana*. It is indicated in bone fracture, low bone mineral density, osteoporosis, osteoarthritis, and joint pains in athletes due to exercises. Due to its *Tridosha Shaman* and *Ushna Virya* characteristics, *Dashmoola Kwatha* acts on the vitiated *Vata Dosha,* which is the primary cause of illness. It can be used to address ailments related to joints, bones, muscles, and nerves. Additionally, it also possesses analgesic and anti-inflammatory qualities.[12] *Lakshadi Guggulu* is mostly indicated in fractures and bone disorders, but is also beneficial in conditions such as osteoporosis, osteopenia and arthritis. It possesses *Balya* (strengthening), *Sandhankara* (unification), and *Vranaropana* (wound healing) properties, enhancing tissue repair and assisting in bone fracture healing. It's components, like *Laksha*, *Asthishrinkhala*, *Arjuna,* and *Ashwagandha,* provide natural calcium, promoting a faster healing process in bone fractures by increasing calcium deposition in the bones and offering strength to bones and joints.[13]

CONCLUSION:

This case report demonstrates the potential of Ayurvedic medicine in effectively managing compression fracture of the vertebral body in conjugation with mild diffused osteoporosis. Thus, it can be concluded that ayurvedic management in the pathologies like compression fracture of the vertebral body not only can relieve the symptoms, but also improve quality of life.

Declaration of patient consent:

Authors declare that they have obtained patient consent form, where the patient has given his consent for reporting the case along with the images and other clinical information in the journal. The patient understands that his name and initials will not be published and due efforts will be made to conceal his identity.

Limitation of study:

This is a single case study. Further, additional research work, particularly randomized controlled trials are required to confirm these findings and make evidence-based recommendations.

Conflict of interest: The author declares that there is no conflict of interest.

Guarantor*:* The corresponding author is the guarantor of this article and its contents.

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