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Successful management of Osteomyelitis through Integrated Approach : A Case Report

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ABSTRACT

Osteomyelitis is a severe condition characterized by the infection and inflammation of the bone and its bone marrow, thus quickly impacting the Harversian systems. It is often caused by bacteria, the methicillin-resistant *S. aureus* bacteria being the most common organism. Conventional treatment typically involves long-term antibiotic therapy, surgical debridement, and supportive measures. However, the increasing prevalence of antibiotic resistance and the adverse effects emphasize the need for complementary and alternative treatment approaches. The rationale for Ayurvedic is that inflammatory swelling is correlated with vidradhi. This case report discusses about the chronic inflammation of osteomyelitis caused by fracture of the humerus with mal-union which has been treated successfully through an Ayurvedic approach by administering *Varunaadi Gana Kashaya* (decoction), *Nyagrodhadi Gana Kashaya* (decoction), *Arogyavardhini Vati* (tablet), *Lakshadi Guggulu* (tablets), Local application of *Jatyadi Taila* (oil). **Results:** The patient was followed up every 7 days while on ayurvedic treatment. In the initial days, the wound was closed with a cast; after 10 days, the cast was removed, and discharge was drastically reduced culminating in overall wound healing. **Conclusion:** This case report highlights the successful management of osteomyelitis using Ayurvedic medicine as an adjunct therapy. The individualized Ayurvedic treatment plan, including internal medicine, external applications, and lifestyle modifications, contributed to symptom improvement, reduced inflammation, and promoted healing in the patient.

Key words: *Abhyantar Vidradhi, Asthi-Majja Vidradhi, Nidan Parivarjan, Chronic Osteomyelitis, MRSA.*

INTRODUCTION

Osteomyelitis is a severe condition characterized by the infection and inflammation of the bone and its bone marrow, thus quickly impacting the Harversian

systems. A persistent, severe, and sometimes fatal infection of the bone and bone marrow is called chronic osteomyelitis. It is often caused by bacteria, the methicillin-resistant *S. aureus* bacteria being the most common organism, fungi, or, less commonly, viruses. Conventional treatment typically involves long-term antibiotic therapy, surgical debridement, and supportive measures. It is a frequently recurring condition, as it is difficult to cure definitively after inadequate treatment of acute osteomyelitis.^[1] However, the increasing prevalence of antibiotic resistance and the potential for adverse effects emphasize the need for complementary and alternative treatment approaches. Long bone osteomyelitis may occur as a result of hematogenous bacterial dissemination from another part of the body, as shown in children, or secondary to trauma following

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compound wounds, as observed in adults. The treatment for osteomyelitis affecting the humerus differs from that for osteomyelitis involving the tibia and femur, having an overall incidence of 3.4%.^[2]

Ayurveda, the ancient Indian system of medicine, provides a comprehensive approach to healthcare. Ayurvedic principles focus on individualized treatments to restore balance and harmony within the body. The use of herbal, authentic Ayurvedic formulations, external applications, and lifestyle modifications can aid in improving symptoms, reducing inflammation, and promoting healing. While Ayurvedic interventions have evidences for therapeutic role in various infectious conditions, their efficacy in osteomyelitis management is yet to be fully explored. The rationale for Ayurvedic treatment is that inflammatory swelling is correlated with *vidradhi*.^[3] It is a disorder that results in one or more swellings, either internal or external, caused by vitiation of the skin, blood, muscle, fat tissue, bone, ligament, and tendon.^[4] The painful condition known as *Bahyavidradhi* also called an external abscess, has all the characteristics of inflammation and a tendency towards suppuration.^[5] The *Ama* (unripe stage), *Pachyamana* (ripening stage), and *Pakva* (ripened stage) resemble those of *Sopha* (inflammatory edema). Conservative management of *Vidradhi* involves the use of both external and internal treatments to prevent inflammation of the edema, as indicated by *Sopha Chikitsa* in Ayurveda.^[6] By *Varanachikitsa*, appropriate surgical operations such as incision, drainage, etc., are carried out if the situation progresses toward suppurative alterations and are explained as "*Antarvidradhi (Asthividradhi)-Naadivrana*" by *Sushrut Samhita in Vidradhi Nidan* Chapter 9.^[7] Ayurvedic treatment in such conditions is good alternative to surgical management. Conservative management also avoids complications that can arise post-surgery and decreases hospital visits. This is a case that has been successfully managed conservatively, based on Ayurveda principles.

CASE HISTORY

A 38 years female patient referred to the Ayurveda Department of Bhaktivedanta Hospital and Research

Institute by the orthopedic doctor with complaints of localized pain at the fracture site, loss of strength in the hand, sinus developed at site and pus discharge from the wound, on-and-off fever, loss of appetite, malaise. History shows a compound fracture of the right humerus 4 years back. The orthopedic surgeon operated the patient four times over a period of one year and then referred the patient to Ayurvedic practitioner in view of failed desired surgical outcome of fractured segments, but the symptoms remained the same. Pus culture sensitivity showed MRSA and antibiotic courses such as injection vancomycin for 4-6 weeks were administered as per the sensitivity. However, the patient did not show any response, and pus discharge was continued without any sign of healing. An Ayurveda surgeon conducted a thorough assessment, and strict diet and lifestyle advice was given to the patient.

Hetu (Causative factor)

1. Fracture and mal-union
2. *Sankramanajanya* (polymicrobial infection: Staphylococcus aureus, Streptococcus pneumonia)
3. *Malabadhata* (constipation)
4. *Agantuja* (external cause) such as *Aharaja* (dietary) or *Vishamashana* (irregular food habits with excessive intake of pungent and sour, i.e., abnormal and excessive intake of curd, etc.)
5. *Arajaska* (irregular menses) every 6 months for 5 years

Astavidha Parikshan (Clinical examination)^[8]

Nadi (Pulse) - *Sarpagati Saam, Guru Sanipatik.*

Mutra (Urine) - *Avila Varna* (normal)

Malam (Stool) - *Malabadhata* (constipation)

Jihwa (Tongue) - *Anupalepa* (clear)

Shabda (Speech) - *Samanya* (normal)

Sparsha (Touch) - *Ushna*

Drik (Eye) - *Samanya* (normal)

Akriti (Shape) - *Sthula* (obese)

Prakruti - *Vata Pitta Prakruti* constitution.

Pathophysiology^{[9][10]}

- *Hetu Sevan - Abhishyandi Aharaja*
- *Dosha - Kapha Pitta Pradhana Tridoshaja*
- *Dushya - Rakta (blood), Kandara (tendons and ligaments), Asthi (bone), Majja (bone marrow), Tvak (skin).*
- *Dosha Adhistan - Asthi (bone)*
- *Agni - Jatharagnijanya (central digestive systems), Dhatvagnijanya (nourishment and metabolism of tissues)*
- *Strotas - Rasa, Rakta, Asthi, Majjavaha, Mansavaha, Purishavaha*
- *Strotodusti - Sanga, Vimargamanam*
- *Udbhavastana - Amashaya (Kapha, Pitta), Pakvashaya (Vata)*
- *Adhistan - The Adhithana was Asthi and Majja with Vata-Pitta- Kapha predominance.*
- *Roga Marga - Madhyama and Shakhagata*
- *Vyadhi Swabhav - Chirkala (chronic).*

Management and Treatment

Treatment of Osteomyelitis comprises of *Aama Pachan* and *Dosha Nirharan*.

Internal Medication

1. *Varunaadi Gana Kashaya* (decoction) ingestion 1 tsf powder with 200 ml water, boil water upto half, drink after filtration in the morning for 15 days x 3 months^[11]
2. *Nyagrodhadi Gana Kashaya* (decoction) twice after food x 3 months^[12]
3. *Arogyavardhini vati* (tablet) x 42 days^[13]
4. *Lakshadi Guggulu* (tablet) 1 BD x 3 months^[14]
5. *Naadivranakarma* (Local application of *Jatyadi Taila* oil) for local medical debridement and healing. (*Sushruta Nadivranchikitsa* chapter)^[15]

Aushadi (medicine)	Matra Avam Kala (dosage)	Anupanam (titration)
<i>Varunaadi Gana Kashaya</i> (decoction)	1 tsp powder x OD x 3 months	boil with 200 ml water upto half f/b filtered
<i>Nyagrodhadi Gana Kashaya</i> (decoction)	1 tsp powder x BD x 3 months	boil with 200 ml water upto half f/b filtered
<i>Arogyavardhini vati</i> (tablet)	1 BD x 42 days	100ml of lukewarm water
<i>Lakshadi Guggulu</i> (tablet)	1 BD x 3 months	100ml of lukewarm water
<i>Jatyadi Taila</i> (oil)	Till wound healing	LA

Lifestyle modifications

1. *Aharaja* (dietary) - Daily wheat or jawar roti or multigrain bhakri, only have moong dal (lentils), all vegetables except tomato, brinjal, potato, and sweet potato.
2. Fruits - Fig, Raisin, chickoo, musk melon, pomegranate.
3. *Vihar* (lifestyle) - *Anulom Vilom Pranayama* for normal *Doshagati*.
4. Sleep early, eat on time, balanced diet (*Samyak Aharaj*).
5. Avoids - Curd, perished food, fermented, stale, fried, beans, late night sleep, sex, late food, rice, daytime sleep after food, anger, excessive chilly, Non-Veg.

After administering the above-mentioned Ayurveda treatment along with diet and lifestyle changes, the patient was followed up every 7 days. In the initial days, the wound was closed with a cast; after 10 days, the cast was removed, and discharge was drastically reduced. The doctor also advised continuing Ayurveda medicines. The next follow-up local application medicine was prescribed. The patient's general condition was improved, with better bowel habits, improved appetite, improved sleep, a lighter feeling in the whole body, and reduced pain at the site of the wound.

After a month follow-up, the patient had no discharge, and an X-ray clearly did not show any sinuses, and the wound had dried completely. A bone segment was completely healed after starting Ayurveda treatment.

Symptoms	Before treatments	2 months after treatments	3 months after treatments
Continuous pain at the fracture site	3+	1+	Absent
loss of strength in hand	3+	1+	Absent
Fever persistence	persistence	On and off	Absent
loss of appetite (Aaruchi)	3+	1+	Absent
Malaise	Severe	Moderate	Mild
Sinus developed at the site (naadivrana)	4+	1+	Absent
Pus discharge at site.	4+	1+	Absent
Constipation	present	No	No

DISCUSSION

If the condition of *Aama* (inflammation) is present, then the remedy should be *Shophahara*, and *Raktavsechankriya* (bloodletting) has to be carried out, i.e., *Shaman Chikitsa*, or palliative treatment. When it reaches the *Pakwa* stage (ripening), it has to be treated like a *Vrana*. Here, *Aama* has been created by the daily intake of curd.^[16]

Properties of curd

Curds have properties of moisture, are unctuous, and hot in potency. Thus, daily intake of curd increases moisture in the tissue and aggravates *Kapha* and *Medhas* (fat). Although curd is mentioned in Ayurveda having many medicinal properties but in certain personalities (*Prakruti*), and *Kala* (time) that is night time acts as *Raktadoshavardhak* (blood enhancer). This abnormal and excessive intake of curd creates *Aama* (inflammation) and thus *Shaman Chikitsa* or palliative treatment has been advised.^[17] As there was no satisfactory clinical outcome with conventionally

available standard treatment, Ayurveda treatment approach evidence better clinical outcome. Just by using different pathophysiological approach enable the doctor to diagnose the condition and changes the prognosis of the disease. With proper diet and lifestyle balance of *Doshas*, *Dhatu*, and *Mala* was established, vitiation of *Doshas* was checked with internal medication, and afterward local application. As there are *Rakta*, *Vata*, *Kapha*, and *Pitta Dushti* (vitiation) in the internal abscess, there are 60 ways mentioned by *Sushrutacharya* for *Vranachikitsa*.^[18] Ayurveda Samhita's elaborately states the principles of treatment to purify the blood and balances the vitiated *Vata*, *Pitta*, and *Kapha* by including a layered treatment pattern. i.e.

1. *Aahar* (Subjective Diet pattern)
2. *Vihar* (tailor made Life style pattern)
3. *Aushadh* - Medicine and Surgery

Ayurveda has a holistic approach to treat the diseases. The role of Physical, emotional, and Spiritual health in building immunity is a crucial factor as per Ayurveda science. This principle of increasing immunity is the unique gift of Ayurveda science to the world of Medicine.

Patient treatment is a stepwise treatment as mentioned below

Nidan Parivarjan (removal of cause) - Hetusevan i.e., Identification of long-standing and triggering causes (*Sannikrishta* and *Viprakushta*) is the first step, stopping the cause itself stops further progress of the disease.

Doshanirharan / Prashamanam (detoxification) - Eliminating or correcting the vitiated *Doshas* with the help of medicinal treatment with necessary ancient surgical techniques such as debridement (*Vran Shuddhi*), cleaning the wound, eliminating dead space, enhancing revascularization (*Rohan Kriya*) of nearby soft tissues, improving wound protection and minimize vascular insufficiency with proper drain. It increases structural stability through the application of *Dhatuposhaka Chikitsa* (*Asthi*, *Majja*, *Rasa*, and *Raktadhatu*). By removing the impurities of *Rakta*

Dahtu and decreasing *Strotorodha*, it reduces bacterial infections, eliminates dead necrotic tissues, and improves blood circulation, nutrition, and the production of good granulation tissue (which resolves in the bone cavity with bone healing).^[19] Every medication used can treat all *Vidradhi* manifestations by penetrating the biofilms linked to the refractory nature of chronic osteomyelitis such as *Lakshadi Guggulu Vati* has properties of repair which triggered on the necrotic bone such as osteoclasts, osteoblasts, histiocytes, and vascular elements. The *Vatakaphahar* property helps with the regression of inflammation, prevents further necrosis, reduces ischemia, and is indirectly helpful for bone rejuvenation.^[20]

Apunarbhav Chikitsa (Non Recurrence) - Preventing the recurrence or further progress of disease with the help of *Rasayan Chikitsa*. This principle enables one to improve immunity.^[21]

CONCLUSION

This case report highlights the successful management of osteomyelitis using Ayurvedic medicine as an adjunct therapy. The individualized Ayurvedic treatment plan, including internal medicine, external applications, and lifestyle modifications, contributed to symptom improvement, reduced inflammation, and promoted healing in the patient. Further research and clinical studies are warranted to validate the efficacy and safety of Ayurvedic interventions in the management of osteomyelitis and to determine the optimal combination of conventional and Ayurvedic therapies for this condition. The step taken by the Indian government in 2017-18 as an integrated medicine policy for the Indian healthcare system is very appropriate in pursuit of our discussion and findings. Ayurveda and Allopathy can go a hand in a hand as an integrated medicine for patients to benefit from almost all complicated and non-complicated diseases for cure and non-recurrence.

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