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An Observational Single Case Study Of Sandhi Vikruti In Amavata By Evaluating X-Ray With Special Reference To Rheumatoid Arthritis.

Dr. Deepali Jeetendra Amale[1], Dr.B.D.Dharmadhikari [2], Dr. Sneha Vijaysing Rathod [3]

[1]Professor, Guide & H.O.D. of Rognidan Evum Vikruti Vigyan. C.S.M.S.S. Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi, Chh. Sambhajinagar.

[2]Associate Professor, Rognidan Evum Vikruti Vigyan. C.S.M.S.S. Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi, Chh. Sambhajinagar.

[3]PG Scholar, Rognidan Evum Vikruti Vigyan. C.S.M.S.S. Ayurveda Mahavidyalaya and Rugnalaya, Kanchanwadi, Chh. Sambhajinagar.

Corresponding author: Dr. Deepali Amale

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Abstract

Amavata is a chronic systemic disorder described in Ayurveda, characterized by the involvement of *Ama* (undigested toxic material) and Vata dosa, producing systemic and articular symptoms. It closely resembles Rheumatoid Arthritis (RA) in modern medicine. *Sandhi Vikruti* (joint pathology) is the prime manifestation, which can be objectively assessed by X-ray. Radiological evaluation provides structural correlation of Ayurvedic descriptions of *Sandhi-Vikara* like *sandhisankochoch, Sandhishotha* (synovial inflammation/swelling), *stambha* (stiffness), *sandhi graha* (ankylosis) and other structural changes.

Keywords- *Amavata*, Rheumatoid arthritis, X-ray, *Sandhi vikruti.*

Introduction :

Ayurveda is a science of life, having principle aim to maintain the health and eradication of disease. The Samhita *grantha* of ayurveda has explained many diseases before thousands of years with their signs and symptoms and proper line of treatment.

The term *Amavata* consists of two words Ama and Vata. Ama is an important causative factor which is associated with vitiated Vata dosha and producing the disease *Amavata*. The *Amavata* as a special disease entity was mentioned first by *Madhavakar* [1].

Samprapti Of *Amavata* :

Nidana Sevana such as *Viruddha* Ahara, *Viruddha* Chestha, *Mandagni*, Nischala, Snigdha Ahara followed by immediate exercise originates from Agni *Mandya* leading to Ama Utpatti (*Apakva* Ahara-rasa → Ama formation). The combination of Ama and Vata causes *strotorodh* which causes Sanga in *Rasavaha* & *Annavaha Srotas* leading to obstruction of normal nutrient flow and disturbance of Vata Gati. Since Sandhi are the primary *Sthana* of Vata. Sanchay in Sandhi, Vata carries ama to Sandhi *Sthana* → *sthanasamsraya*, which further produces Sandhi Vikruti like *sandhisanchoch*, sandhi *shotha* (synovial inflammation/swelling), *stambha* (stiffness), sandhi *graha* (ankylosis, *Sparsasahatva* (tenderness) and produces symptoms of *Amavata*. Ama and Vata vitiated simultaneously and disease manifested mainly in joints of Hasta, Pada, Sira, Trika, Gulpha, Janu and Uru.[2,3]

According to *Madhavakar* Pradhan Lakshanas

- *Sarujam Sandhishotha*: Hasta, Pada, Shiro, Gulpha, Janu, Uru Sandhi's are chiefly involved in *Amavata*.[4]
- *Vrishchika danshavata* Vedana, *Utsahahani*, *Bahumutrata*, *Kukshikathinya*, *Kukshishoola*, Nidra *Viparyaya*, *Chhardi*, *Bhrama*, *Murchha*, Hritgraha, *Vibandha*, *Antrakujana*, Anaha, Agnimandya, *Praseka*, Gaurava, *Vairasya*, Daha, Trishna

Rheumatoid Arthritis	*Amavata*
Morning stiffness	Gatra *sthabdata* or Sandhi *sthabdata*
Arthritis of 3 or more joints	Bahu sandhi *shotha*
Arthritis of hand joints	Hasta sandhi *shotha*
Symmetrical arthritis	Bahu sandhi *shotha* (*Ubhaya*)

Pratyatma Lakshanas

In *Amavata*, Sandhi's are the main site of manifestation of clinical features, thus joint associated symptoms are considered as *Pratyatma* Lakshanas of disease *Amavata*.

These are as follows:

- Sandhi *Shoola* (joint pain)
- Sandhi *shotha* (joint swelling)
- *Sthabdata* (stiffness)
- *Sparsasahatva* (tenderness)

Upadrava Of *Amavata*: [5]

- *Angavaikalya*(deformity) is an *Upadrava* considered by Harita. In Madhava *Nidhana* the *Amavata Upadrava* are mentioned, they are Trit, *Chhardi*, *Bhrama*, *Murchha*, Hritgraha, Jadya, *Antrakujana*, Anaha etc.

- All the Systems will involve or get disturbed in the *Amavata*. It is not treated in time it produces anatomical deformities like Sandhi Vikruti and Hritgraha. So proper management is must from the onset of disease. The *Upadrava* depends upon the type of kapha involved in *samprapti*. If Ama combines with *Shleshka* kapha & gets lodged in sandhi *Sthana* creates sandhi *vikruti* and if Ama combines with *Avalambak* kapha resides in Hridaya develops *Hritgraha*.
- Rheumatoid arthritis is a chronic, progressive autoimmune arthropathy of synovial joints that causes swelling, stiffness and pain in the joints, joint deformity and affects other organs like lungs etc. [6] *Amavata* is very closely resembles with the Rheumatoid arthritis on the basis of its pathogenesis and clinical manifestation, includes morning stiffness (>45mins) and pain and swelling in joints, painful movements, symmetrical arthritis etc. As chronicity of diseases progress, it involves some sites for deformity like nodular formations at joints(elbow), and some organs like lungs. Various deformity also found like zig zag deformity, piano key deformity, boutonniere deformity, swan neck deformity, ulnar deviation etc. [7]

Pathophysiology Of RA :

Genetic Susceptibility and Environmental Triggers such as Smoking, infections, gut dysbiosis, pollutants leading to Loss of Immune Tolerance.

Activation of Antigen-Presenting Cells (APCs) and B-cell Activation (Autoantibody production (RF, Anti-CCP) which Immune Complex Formation which deposits in synovium causing Synovial Inflammation (Synovitis) and Pannus Formation (Hyperplastic invasive granulation tissue in synovium). pannus release enzymes and cytokines that causes Cartilage & Bone Destruction and causes RA. [7,8]

Clinical Features of RA- [9]

- Joint pain, swelling, stiffness (esp. morning)
- Symmetrical polyarthritis
- Progressive deformities (ulnar deviation, swan-neck, boutonnière)
- Extra-articular features (nodules, vasculitis, systemic inflammation).

X-ray /radiography are a form of electromagnetic radiation with a short wavelength and high energy, capable of penetrating human tissues and creating images of internal structures . It plays a crucial role in the diagnosis, monitoring, and staging of musculoskeletal disorders such as Rheumatoid Arthritis (RA).[10]

Radiography is the traditional gold standard for assessment of joint damage. Radiography may be used to examine multiple joints rapidly, and for evaluating rheumatoid patients. Because of its exquisite resolution and depiction of bony structures, radiography is very good at detecting erosions .

The early radiographic findings [11]:

- Nonspecific periarticular soft tissue swelling with a fusiform configuration and periarticular osteopenia.
- Soft tissue swelling occurs from a combination of joint effusion, edema, synovial enlargement (pannus formation), and/or tenosynovitis.
- Osteopenia typically becomes more generalized as the disease progresses. Initially, the small joints may widen as a result of effusion; however, as cartilage becomes eroded, the cartilage spaces narrow.

Late Radiographic Findings

Subluxations from ligament, tendon, and joint capsule laxity become more pronounced and may lead to frank dislocations. Once RA progresses to cartilage loss, the altered mechanics predispose to pressure erosions at sites of bone-on-bone rather than cartilage-on-cartilage interfaces.

Wrists, Feet and Ankles-As in the hands, alterations in the wrists due to RA include soft tissue swelling, erosions, joint space narrowing, alignment abnormalities, and ankylosis.

The metatarsophalangeal (MTP) joints are among the first to be affected by RA.

Large Appendicular Joints (knee, hip, elbow, and shoulder) -uniform and severe cartilage space loss.

The Prevalence of Rain India affect more in female as compared to male 3:1 ratio. [12]

Aim :

To observe and evaluate sandhi *vikruti* in *Amavata* through x-ray examination and to establish radiological correlation with rheumatoid arthritis**.**

Objectives:

1. To observe and evaluate sandhi *vikruti* in *Amavata*.
2. To study *Amavata* in detail.
3. To study Rheumatoid arthritis in detail.
4. To study X-ray findings related to rheumatoid arthritis in detail.

Methodology:

Study Type : Observational Study.

Study Design:.

Diagnosed patient of *Amavata vyadhi*

Diagnosed patient of *Amavata vyadhi*

⇓

***Enrollment* of patient in study and obtain written informed consent.**

⇓

Patient assessed for subjective and objective criteria

⇓

Correlation of obtained data

⇓

Discussion

⇓

Conclusion

Study Design

Inclusion Criteria :

1. Diagnosed patient of *Amavata*.
2. Patient will be selected irrespective of their sex, occupation, socioeconomic status.

Exclusion Criteria :

1. 1.Diagnosed patient having other joint disorders like osteoarthritis, Gout, trauma
2. 2.Patient having Systemic diseases like Uncontrolled Diabetes, Thyrotoxicosis, Other .

3. metabolic disorders and other severe systemic diseases.

Subjective criteria:

1 . Sandhi *shoola* (Joint Pain)

Grade	Sandhi *shoola* (Joint Pain)
1	Mild bearable pain
2	Continuous Pain with No Difficulty in Movement
3	Continuous Pain with Difficulty in Movement

2. ***Sandhigraha* (Joint stiffness)**

Grade	*Sandhigraha* (Joint stiffness)
1	Stiffness last for half hour or hour only in morning
2	Stiffness last for more than one hour
3	Stiffness last for all day and night

3. ***Sparshasahtva* (tenderness/pain on touch)**

Grade	*Sparshasahtva* (tenderness/pain on touch)
1	Bearable pain on touch
2	Continuous pain on touch
3	Unbearable pain on touch

4. **Sandhi *shotha* (joint swelling)**

Grade	Sandhi *shotha* (joint swelling)
1	Mild swelling
2	Moderate swelling
3	Marked swelling

Objective Criteria :

X-Ray:

Grade	X-Ray Findings
1	Features periarticular osteopenia and subchondral bone destruction but no deformity.
2	Cartilage and bone destruction, joint deformity, and osteopenia
3	Cartilage and bone destruction, joint deformity, and osteopenia bony or fibrous ankylosis (joint fusion)

Case Study :

A 30-year-old male brought by relative with Sandhi *shoola* in bilateral wrist and finger joint with pain last more than 1 hour and pain on touch since1 year and also Generalised weakness, loss of appetite, heaviness in body.

Patient details:

Name: *Mrs.XYZ*

Age/Sex: 30 yrs/ M

Occupation: Job

Chief complaints

- Sandhi *shoola* /Pain and Sandhi *shotha* /swelling in bilateral wrist and fingers joints since1 year.
- Sandhi *graha* / Morning stiffness lasting more than 1 hour.
- Restricted movements of affected joints.
- *Sparsasahatva* / pain on touch of affected joints.

History Of Present Illness:

Patient noticed gradual onset of pain and swelling in small joints of hands, associated with stiffness, aggregated in morning and relieved on mild activity. Over months, deformities started to appear in fingers.

Past History: No history of major illness.

Family History: Mother with history of arthritis.

Clinical Examination:

General examination: Moderate built, pallor absent, vitals – normal

Systemic examination:

- Symmetrical involvement of both wrists and MTP joints.
- Swelling and tenderness present.
- Morning stiffness > 1 hour.
- Early deformity: ulnar deviation of fingers.

***Ashtavidh* Pariksha:**

***Ashtavidh* Pariksha**
Nadi: 80/min
Mala: *Malavashtmbha*
Mutra: 4 to 5 time in day, 1 to 2 times in night
***Jivha*:** Sama
Shabda: Prakrut
Sparsha: Anushna
Drik: Prakrut
Akriti: Madhyam

***Dashavidha* Pariksha:**

***Dashavidha* Pariksha**
Prakruti: Vata Pradhana-Kapha *Anubandhi*.
Vikruti: Dosha - *Vatapradhana Tridosha*, Dushya - Rasa, Meda, Ashti.
***Satwa*:** Madhyama.
Sara: Rakta
***Samhanana*:** Madhyama
Pramana: Madhyama
***Saatmya*:** Sarva Rasa
Aharasakti: Madhyama
***Vyayamshakti*:** Avara
Vaya: 30 years

***Samprapti* Ghatak :**

Dosha	Vata (Vyana, Samana, Apana) and kapha (*Kledak*, Bodhaka, *Sleshmak*)
Dhatu	Rasa, Mamasa, *Asthi*, *Majja*
Updhatu	*Snayu* and Kandara
Srotasas	*Annavaha*, *Rasavaha*, *Asthivah*, *Majjavah*
Udbhavasthana	*Amashya* (Ama), *Pakwashaya* (Vata)
Adhisthana	whole body
Vyaktasthana	Sandhi
Avayava	Sandhi
Agni	*Jataragni* Mandya, *Dhatwagni Mandya*

Observations :

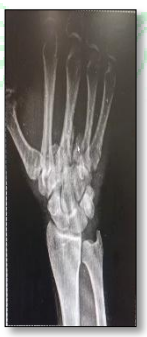
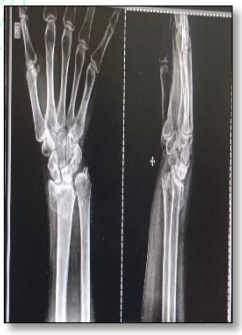
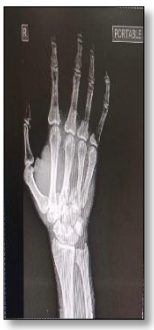
Subjective Criteria :

Subjective Criteria	Observed Grade
Sandhi *shoola*	3
Sandhi *graha*	2
Sparsasahatva	3
Sandhi *shotha*	3

Objective Criteria :

X-Ray findings :

Objective Criteria	Observed Grade
X-Ray findings	3

Observation in the present case showed grade 2and 3 changes of *Amavata* and grade 2 changes of RA**.** Clinical picture of a given observed patient with rheumatoid arthritis showing ulnar drift of the fingers, resulting in restricted daily activities. b, c Radiographs of the right hand displaying ulnar deviation of the fingers, mild to moderate erosions in the MCP joints, and partial carpal fusion in the wrist.

Discussion :

- *Amavata* is a disease described in Ayurveda with Ama and Vata as principal pathogenic factors. In the present case showed grade 2and 3 changes of *Amavata* with the clinical manifestation which primarily involves Sandhi Vikriti (joint pathology), expressed through *Sandhishoola* (pain), *Sandhishotha* (swelling), Stambha (stiffness), *Sparsasahatva* (tenderness), Akruti Vikriti (deformity) and Gati Hani (restriction of movement).
- X-ray in this case showed grade 2 changes of RA.
- In contemporary medicine, these features closely resemble the signs and symptoms of Rheumatoid Arthritis (RA), a chronic, systemic autoimmune disorder characterized by symmetrical polyarthritis, synovial inflammation, and progressive joint destruction.
- The present case of observational study attempted to document and analyses Sandhi Vikruti objectively and subjectively in patient of *Amavata*, correlating with standard RA clinical parameters.
- Findings from the study reaffirm that Sandhi *shoola*, Sandhi Stambha, and Sandhi *shotha* were the most consistent and predominant features, aligning with Features periarticular osteopenia and subchondral, Cartilage and bone destruction, joint deformity, and osteopenia bony or fibrous ankylosis (joint fusion) bone destruction.
- Mapping these with Ayurvedic criteria highlights a strong correlation: Stambha, *shotha* with joint space narrowing; and Akruti Vikrti with deformities and erosions. This demonstrates that traditional clinical observations of Sandhi Vikrti are not only clinically evident but can also be objectively validated with imaging.
- Thus, the study underscores the importance of integrating X-ray evaluation into the assessment of *Amavata*, bridging classical Ayurvedic symptomatology with contemporary diagnostic standards of RA.

Conclusion :

- Study of sandhi *vikruti* in *Amavata* is done by evaluating x-ray with special reference to Rheumatoid arthritis.
- The present case demonstrates clear correlation between Ayurvedic description of Sandhi *vikruti* and RA with x-ray grading.
- Radiological findings such as joint space narrowing, periarticular osteopenia, and erosions correlate strongly with the Ayurvedic descriptions of Sandhi Vikriti (*shotha*, Stambha, Akrti Vikrti).

- X-ray evaluation provides an objective tool to validate subjective and clinical criteria of Sandhi Vikruti, strengthening the clinical diagnosis and staging of *Amavata*.
- Integration of Ayurvedic clinical parameters with modern radiological assessment establishes a comprehensive framework for understanding disease progression and enhances the evidence base of Ayurvedic classification of disease.
- Such observations help in bridging Ayurveda- *Amavata* and modern Rheumatology, aiding in diagnosis, treatment and prognosis.

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Dr. Deepali Amale Inter. J.Digno. and Research