



MASTERING FRACTURE CARE: INSIGHTS FROM SUSHRUTA'S LEGACY

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ABSTRACT: Orthopedic conditions have been comprehensively elucidated in the Ayurvedic literature under the term "Bhagna Chikitsa." Acharya Sushruta, a prominent figure in ancient medicine, provided detailed insights into fractures, including their etiology, classification, and management modalities. In ancient times, fractures, termed "Bhagna," were frequently encountered due to warfare or animal attacks, whereas in contemporary times, they are commonly a result of road traffic accidents (RTAs). Sushruta categorized fractures based on the nature of trauma, fracture shape, displacement of fragments, and presence of wounds. Fractures occurring within bones were termed "Kand bhagna," while those involving joints were termed "Sandhimoksha" (dislocation). Sushruta's principles of fracture management, established centuries ago, encompass both conservative and surgical approaches, with conservative methods such as Kushabandha, Alepa, Chakrayoga, and Taila Droni remaining relevant. The advent of Western medicine introduced surgical instruments like intramedullary nails, which are utilized in managing complex fractures but may prolong union and healing. This paper aims to illuminate the ancient orthopedic wisdom, particularly in fracture management, and explore its potential relevance in modern times. By examining the concepts, theories, and techniques practiced millennia ago, we can appreciate their enduring value and consider their integration into contemporary orthopedic practices.

KEYWORDS: Bhagna, Orthopedic fracture, displacement, treatment, sandhimoksha

1) INTRODUCTION:

Ayurveda, celebrated as the holistic science of life, offers profound insights into disease prevention and healthcare practices. In the contemporary landscape, trauma stands as a formidable challenge, particularly concerning skeletal injuries stemming from various traumatic incidents. Dating back to the 1st century B.C., Acharya Sushruta, a seminal figure in Ayurvedic medicine, meticulously

chronicled the diagnosis and treatment of traumatic orthopedic injuries, encapsulating his wisdom under the purview of "Bhagna and Bhagna treatment." Sushruta's teachings encompassed a nuanced understanding of osteology (asthi shaarir), fracture etiology (bhagna nidaan), pathology (rog nidan), clinical manifestations, and management strategies (chikitsa), comprising both non-surgical and surgical interventions, along with addressing attendant complications. In Ayurveda, fractures are denoted as "Bhagna," signifying a disruption or fracture in the continuity of bone structure, categorized into Sandhimoksha (dislocation) and Kandabhagna (bone fracture).

This article endeavors to unearth the latent insights, skills, and methodologies for identifying and treating fractures and dislocations elucidated in Ayurvedic texts. Furthermore, it aims to draw parallels with contemporary medical practices, shedding light on the evolution and acceptance of modern approaches to managing these orthopedic conditions. By juxtaposing ancient Ayurvedic wisdom with modern medical knowledge, we aspire to underscore the enduring relevance of traditional healing practices in navigating present-day healthcare challenges.

2) ETIOLOGY:

Fractures result from various traumatic incidents (AAGHAT), including falls (patan), crushing injuries (peedana) blunt force trauma (prahar), forceful impacts, traction injuries, animal bites, slips, compression, and blunt trauma.

“पतिपीडिप्रहाराक्षेपणव्यालमृगदशिप्रभृतनभरनभघातनिशैरिकनिधमस्थान भग्नमुपनदशान्ति “(सु० नि० 15/3)

3) GENERAL SYMPTOMS OF FRACTURE

As said by Acharya Sushruta ,

- 1) **Shvyathubahulyam (marked swelling)** - generally fracture, whether it is hairline or comminuted, it will be associated with moderate to severe swelling.
- 2) **Sparshasahisnutvam (tenderness)** - tenderness is such a sign that it is invariably present in all types of fractures.
- 3) **Avapidyamane shabda (crepitus)** - presence of crepitus is a definite indicative of fracture, can confirm diagnosis clinically.
- 4) **Vividhavedanapradurbhavah** (Different types of pains) - the fractured bone before its reduction and immobilization produces variety of pain. This depends on nature of trauma, bone fractured, displacements of the fragments, and nature of soft tissue injury.
- 5) **Sarvasu Avasthasu Na Sharmalabha** - (Inability to get comfort in any position) - Fracture gives to pain and discomfort to the patient till immobilizing it. The discomfort is such that patient remains restless in any posture of fractured part.

ACCORDING TO MODERN MEDICAL SCIENCE,

Pain is a subjective symptom that is almost always the first and most significant one.

- Swelling - This is brought on by medullary blood haemorrhage and soft tissue injury. For some unknown reason, swelling occurs more frequently in fractures than in dislocations.
- Deformity - Patients who have fractures that have displaced also exhibit deformity.

- Inability - To use the limb or part that is injured.
- Crepitus -This unusual gating sensation is caused by friction between the ragged surfaces of the broken shards

5 TYPES:

SANDHIMOKSHA	MODERN CORRELATION
<i>Utpishtha</i>	<i>Fracture dislocation</i>
<i>Vishlishta</i>	<i>Dislocation due to ligament tear</i>
<i>Vivartika</i>	<i>Anteroposterior dislocation</i>
<i>Avakshipta</i>	<i>Downward displacement</i>
<i>Tiryakshipta</i>	<i>Oblique displacement</i>
<i>Atikshipta</i>	<i>Gross displacement</i>

TABLE 1.
SANDHIMOKS
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BHAGNA	MODERN CORRELATION
<i>Karkataka</i>	<i>Depressed Fracture</i>
<i>Ashwakarna</i>	<i>Complete Oblique Fracture</i>
<i>Churnita</i>	<i>Comminuted Oblique Fracture</i>
<i>Picchita</i>	<i>Compressed Fracture</i>
<i>Asthichhallit</i>	<i>Periosteal Avulsion Fracture</i>
<i>Kandabhagna</i>	<i>Complete Compound Fracture</i>
<i>Majjanugat</i>	<i>Fracture Impaction</i>
<i>Atipaatita</i>	<i>Complete Compound Fracture</i>
<i>Vakra</i>	<i>Greenstick Fracture</i>
<i>Chhinna</i>	<i>Incomplete Fracture</i>
<i>Paatita</i>	<i>Comminuted Fracture</i>
<i>Sphutita</i>	<i>Fissured Fracture</i>

TABLE 2.
BHAGNA AND
ITS MODERN
CORRELATIO
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6) PROGNOSIS: Acharya Susruta has de-scribed the prognosis of fractures in to Suk-hasadhya, Kastasadhya, and Asadhya after considering the following points:

- Prognosis,
- Seasonal Variation,
- Age,
- Status of patient,
- Site of fracture,
- Status of Asthi
- Type of fracture.

SUKHASADHYA -According to Acharya Susruta the patient having fracture in Balyakal(childhood), Alpa Doshyukta Bhagna (hair-line fracture), in Shishira Ritu, with goodnutritional status having good prognosis of Healing fracture.

Kastasadhya :Acharya Susruta has described that cures are affected with extremedifficulty in Churnita Bhagna (Comminuted#),Chinna Bhagna (Incomplete#), Ati-patita Bhagna (Complete #), and Majjanu-gata Bhagna (Impacted #) and in Intraarticular Fractures.

The fractures occurring in -

- ❖ Pediatric age group
- ❖ Frail and emaciated persons
- ❖ Individuals suffering with Dermatological, Asthmatic anomalies and other supervening disorders.
- ❖ A person with intemperate habits or Vatika temperament or who is sparing in his diet have also poor prognosis.

ASADHYA:

- Complete fracture and dislocation of Pelvic bone with displacement.
- Comminuted (Churnita) fractures of iliac bone and Frontal bone.
- Dislocations of the cranial bones.
- Fracture of sternum, temporal bone, vertebral column and cranium

7) TREATMENT (BHAGNA CHIKITSA)

The ancient Ayurvedic texts have described 'Asthibhagna Chikitsa' thoroughly. This includes:

A) Four Principles of BHAGNA CHIKITSA/FRACTURE Treatment:

अवनामितमुन्नह्येदुन्नतं चावपीडयेत् ॥१७॥ आच्छेदतिक्षिप्तमधो गतं चोपरि वर्तयेत् ॥ आच्छनेः पीडनेश्चैव सङ्क्षैर्बन्धनैस्तथा ॥१८॥ सन्धीच्छरीरे सर्वास्तु चलानप्यचलानपि ॥ एतैस्तु स्थापनोपायैः स्थापयेन्मतिमान् भिषक् ॥१९॥

1. Anchan- To apply traction
2. Pidana- Manipulation by local pressure
3. Sankshep- Opposition and stabilization of fractured part of bone.
4. Bandhan- Immobilization

B) PRINCIPLES OF FIXATION

Sushruta describe the various modalities of treatment

Immobilization is an important part in treatment of fracture.

The barks and clips of several trees were selected to serve as splints.

The important woods, which commonly chosen and applied for this purpose, are 1.Madhuka.

2.Udumbera.

3. Aswattha. 4. palasa 5. Kakubha.

6.Vansha.

The aim of splints in Susruta period was not only to provide an effective immobilization but also to treat the injured site by the medicinal properties of these woods. The limbs can exactly fit into the inner concave surface of the barks

The outer surface of barks being rigid gives strength to the limb.

The inner surface of barks being soft, acts as a cushion to the limb, there by avoiding any pressure sore from tight splintage.

KUSHA BANDHANA (Application of P.O.P.cast or splint)Kusha bandhana is a technique that ancient Indian surgeons practiced for fracture immobilization. Difinition of Ideal Bandhan तत्रातिशिलं बद्धे सन्धिस्थैर्यं न जायते ॥९॥ गाढेनापि त्वगादीनां शोफो रुक् पाक एव च ॥ तस्मात् साधारणं बन्धं भग्ने शंसन्ति तद्विदः ॥१०॥ (S.,C.3)

Sushruta emphasize that correct pressure in tying a splint/bandaging required.

C)PRINCIPLE OF REHABILITATION

मृत्पिण्डं धारयेत् पूर्वं लवणं च ततः परम् ॥

हस्ते जातबले चापि कुर्यात् पाषाणधारणम् ॥ (su.c.3/35)

The importance of physiotherapy in a limb-injury was also appreciated by Susruta.

Exercises starting in small doses which may be gradually increased at any rate, and exercises should not be prescribed all at once in the beginning.

A. lighter objects may be held to begin with, eng. a mua-ball, and

B. then a heavier substance like a lump of rock-salt

c. finally still harder objects, e.g. Stones.

D) PRINCIPLE OF MALUNITED FRACTURE

काण्डभग्ने प्ररूढे तु विषमोल्बणसंहिते ॥ आपोथ्य समयेद्भ्रं ततो भग्नवदाचरेत् ॥ (SuC352)

In a case of transverse fracture, when it has united in a curved position and even when consolidated, it should be refractured, set right and treated as an ordinary fracture.

E) PREVENTION OF INFECTION

भग्नं नैति यथापाकं प्रयतेत तथा भिषक् ॥ पक्वमांससिरास्त्रायु तद्धि कृच्छ्रेण सिध्यति ॥ ६९ ॥

Primary aimis to no infection at fracture site.

- Avoid contamination and infection.
- Infected fracture bone is difficult job to manage
- Sushruta strongly recommended the adoption of measures that would avoid suppuration.

F) DEFINITION OF IDEALLY UNITED FRACTURE

भग्नं सन्धिमनाविद्धमहीनाङ्गमनुल्बणम् ॥ सुखचेष्टाप्रचारं च संहितं सम्यगादिशेत् ॥ ७० ॥

Sushruta drafts certain criteria of ideally united fracture and gives in clear terms what a surgeon is to except in a case of ideally healed fracture.

1. Absence of gap between the broken fragments.
2. Absence of shortening.
3. Absence of deformity.
4. Return of painless and easy movements.

G) DRUGS WHICH PROMOTE HEALING (SU.C.3/13)

गृष्टिक्षीरं ससर्पिष्कं मधुरौषधसाधितम् ॥

शीतलं लाक्षया युक्तं प्रातर्भग्नः पिबेन्नरः ॥

- Susruta also advised internal drugs
- These provide liberal amount of proteins, fats, calcium and mineralo-vitamins.

The fractured patient take daily morning

- milk of a primiparous cow processed with ghrita, drugs of madhura group and laksa. It should be taken after it is cool.

"The milk of a primiparous cow is particularly rich in proteins. The fats and other substances added to this preparation strengthen the bones."

ASTHIPOORANA (Bone Grafting)

CHAKRAYOGA (Skeletal Traction)

KAPATASHAYANA (Fracture Bed) VIDHI

H) NUTRITION FOR FASTER FRACTURE HEALING

शालिर्मांसरसः क्षीरं सर्पयूषः सतीनजः ॥

बृंहणं चान्नपानं स्याद्देयं भग्नय जानता ॥५॥

Apart from the tonics, Susruta has paid due attention to elevate the nutritional status of the patient to be taken in the routine.

- For this purpose he has advocated a liberal use of Sali (शालि) rice, meat preparation, milk, ghee, pulses and other elements as are supposed to enhance the process of Brinhana (बृंहणं) that is regeneration of different tissues.

I) PAIN RELIEVING FORMULATIONS (POULTICE):

Roots of Amrantaka, Oxalis orniculata (Changeri), Moringa olifera (Shobaanjana), Roots of Boerhavia diffusa (Punarnava), Betula utilis (Burjpatra) and Costus speciosus (Kebuk) all together macerated either with Kanji and ghee and cooked over fire and applied as poultice which will relieve pain, swelling and helps in quick healing.

DECOCTIONS: Nygradadhi Gana or Panchmooladi Gana added with milk and poured lukewarm over the lesion will relieve pain. **OIL/ TAILA:** Chakra oil (fresh oil from the oil mill) can be applied. Bhagna Sandhana Karaka oil and Gandha oil also mention by Acharya Sushruta

8) CONCLUSION:

In ancient texts, Acharyas expound upon a plethora of fractures and dislocations, prescribing treatments tailored to each injury's severity, all without the aid of modern diagnostic tools such as radiology. Despite the absence of such technologies, Acharya Shushruta's comprehensive writings meticulously detail 12 distinct fracture types, remarkably aligning with modern orthopedic classifications. Moreover, he intricately categorizes these injuries based on their causative factors, whether stemming from falls, impacts, or compressions, showcasing a profound understanding of their etiology.

Endowed with profound knowledge and practical wisdom, these ancient practitioners administered treatments with remarkable efficacy and minimal complications. In instances of complications, a diverse array of formulations were available for addressing them. Notably, beyond recognizing mere similarities in fracture types and treatment principles, the methodologies for managing Bhagna (fractures) display remarkable parallels with contemporary orthopedic practices. The medicines, formulations, rejuvenators, and dietary restrictions for the rapid and complete healing of fractures mentioned in Ancient Ayurveda.

Orthopaedics in traditional Indian medicine was well evolved and widely employed with desired results.

The concepts of ancient orthopaedic principle are true even in today's practice.

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