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FRACTURES AND IT'S MANAGEMENT: AYURVEDIC AND MODERN PERSPECTIVES

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ABSTRACT

Bhagna is common problem of the accident now a day due to speeding, drunk driving, night driving, rain, unsafe lane changes, and animal crossing etc. which was well explained with their cause sign symptom classification and treatment in classical *Ayurvedic* Literature. Such orthopaedic conditions are well explained and documented in the literatures of *Ayurveda* in the name of *Bhagna Chikitsa*. Fracture are also very well explained in modern, even another separate department with name "Orthopaedic" is formed which deal with the correction of deformities of bone or muscles. Our aim is to identify the similarities and differences between the classification, treatment and assessment of fractures according to Conventional Medicine and *Ayurveda*. Hence this paper, presents a historic perspective of fracture management in the *Ayurvedic* tradition and its modern perspective.

KEYWORDS: Fracture, *Bhagna*.

INTRODUCTION

Indigenous system of medicine does not limit itself to just fulfilling the needs of primary health care, but also reach out to certain specialized areas. One such popular but little-known area is that of *Bhagna Chikitsa*.

The word '*Bhagna*' is derived from "***bhanj***" *dhatu* and *"**katu**" pratyaya*. "*Bhanj*" means motion and "*katu*" means to break. Which means breach /break in movements / or continuity of bone.

In traditional Ayurveda practice, the fracture of bones and their treatment was first mentioned in *Susruta Samhita- Nidana Sthana* and *Cikitsa Sthana* from the view of surgical management in 1500 B.C.

The principles laid down by *Sushruta* are so relevant that they are even practiced by toady's orthopedic surgeons. Those four basic principles (known as *'four principals of treatment)* are:(1) *Anchana* (2) *Peedana* (3) *Sankshepana* (4) *Bandhana.*

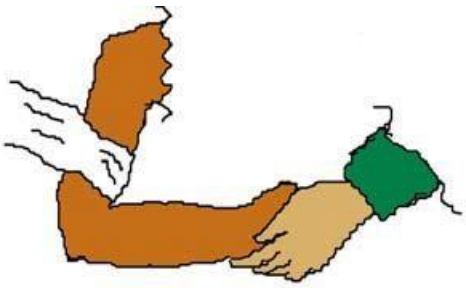

Figure 1: ***Anchana (Traction)***

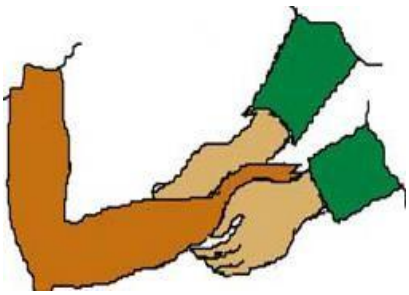

Figure 2*: Peedana (Manipulation)*

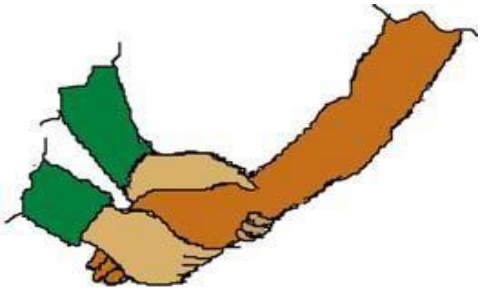

Figure 3: Sankshepana (Opposition and Stabilization).

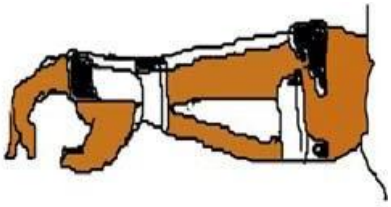

Figure 4: Bandhana (Immobilization).

AIM AND OBJECTIVES

- The aim of this study is to compare the concepts of diagnosis and management of fractures (*Asthibhagna*) from the points of view of *Modern Medicine* and *Ayurveda*.
- To understand the concept of *Asthibhagna* according to *Ayurveda*.
- To identify the similarities and differences between the classification, treatment and assessment of fractures according to *Conventional Medicine* and *Ayurveda*.

AETIOLOGY

Ayurvedic Perspective

Acharyas have described, falling from heights, squeezing the body greatly, hitting, beating, very vigorous movements, bite by wild animals and such other assaults /injury are the causes for different kinds of Bhagna.[1]

Modern Perspective

Fractures of bones can happen in a variety of ways but the common causes –

- When the force on the bone is too large and occurs suddenly as in road traffic accidents etc.
- When a force on the bone is chronic and repetitive.
- When the natural resistance of the bone is eroded by a disease process (e.g. tumor, infection, osteoporosis etc.).

SYMPTOMS AND SIGN

Ayurvedic Perspective

1. **Sandhimukta/ Dislocation-** *Ashakti* (inability) of *Prasaran* (extension), *Akunchan* (flaxion), *Vivertan* (movement) and *Akcchepan* (to project), *Ugrarujatvam* (severe pain), *Sparsha-asahatvam* (intolerance to touch).[1]
2. **Kandabhagna/ Fracture-** *Shwathubahulya* (Profound swelling), *Spandan* (throbbing pain), *Vivertan Sparsha-asahatvam* (intolerance to movement and touch), *Avapeedmane-shabdam* (crackling sound on movement), *Srastangata* (drooping down of the part), *Vividhavedanapradurbhava* (several type pain produce), *Sarvaavasthasunasarvalabham* (no relief in any position).[1]

Modern Perspective

- **Pain**: This is a very subjective symptom and is invariably the first and the most important complaint. It may be mild, moderate and severe and may be due to tearing of periosteum (which contains the nerve endings), soft tissue injury, vascular injury, nerve injury, etc.
- **Swelling**: it is due to soft tissue injury, medullary bleeding and reactionary haemorrhage. Swelling is usually more in fractures and less in dislocations.
- **Deformity**: Patients with displaced fractures and dislocations usually present with deformity.
- **Tenderness**: This is an important clinical sign in bone and joint injuries and is usually seen after trauma.

- **Loss of transmitted movements:** When one end of the limb is rotated, it automatically is transmitted to the other end. Due to the break in the continuity, this is no longer possible in displaced fractures.
- **Crepitus:** This is an abnormal grating sensation produced by the friction between two ragged surfaces of the fracture fragments. Obviously, it is electable only in displaced fractures. It should be elicited very gently and at the end of the clinical examination.
- **Shortening:** Limb shortening of various degrees is common in bone and joint injuries.
- Abnormal mobility between fracture fragments is a sure sign of fracture.

CLASSIFICATION OF FRACTURE

Ayurvedic Perspective

Bhagna is of two types *Sandhimukta* or dislocation and *Kandabhagna* i.e. Bone fracture.

***Sandhimukta*: 6 types**

1. **Utpista** - Fracture dislocation.
2. **Vislista** -Subluxation.
3. **Vivartita** -Dislocation with lateral displacement.
4. **Avakshipta** - Dislocation with downward displacement.
5. **Atikshipta** - Dislocation with over-riding.
6. **Tiryakshipta** - Dislocation with oblique displacement.

Kandabhagna: 12 types

1. **Karkataka** - Depressed fracture.
2. **Ashwakarana** - Complete oblique fracture.
3. **Churnitam** - Communicated fracture.
4. **Pichhitam** - Fracture by compression.
5. **Asthichallita** - Sub periosteal avulsion.
6. **Kandabhagna** - Complete spiral fracture.
7. **Majjanugatam** - Impacted fracture.
8. **Atipatitam** - Complete compound fracture.
9. **Vakra** - Green stick fracture.
10. **Chinnam** - Incomplete fracture.
11. **Patitam** - Comminute fracture flat bones.
12. **Sputita** - Fissured fracture.

Modern Perspective[4]

On the basis of aetiology

- **Traumatic fracture**: a fracture sustained due to trauma is called as traumatic fracture (e.g. fracture caused by a fall, road traffic accident, fight etc.)
- **Pathological fracture**: a bone which has been made weak by some underlying disease is called a Pathological fracture (e.g. a fracture through a bone weakened by osteoporosis, bone tuberculosis, metastasis etc.).
- **Stress or fatigue fracture**: It is usually an incomplete fracture commonly seen in athletes and in bones subjected to chronic and repetitive stress (e.g. third metatarsal fracture, fracture tibia, etc.).

On the basis of displacement

- **Undisplaced fracture:** These fractures are easy to identify by the absence of significant displacement.
- **Displaced fracture:** the displacement can be in the form of shift, angulation or rotation.

On the basis of relationship with external environment

- **Closed fracture:** overlying skin and other soft tissues are intact, is called a close fracture.
- **Open fracture:** A fracture with break in overlying skin and soft tissues, leading to the fracture communicating with the external environment, is called an open fracture.

On the basis of complexity of treatment

- **Simple fracture**: a fracture in two pieces, usually easy to treat, is called simple fracture.
- **Complex fracture:** a fracture in multiple pieces, usually difficult to treat, is called complex fracture.

On the basis of patterns

- **Transverse fractures**: Any fracture that forms an angle less than 30° with the horizontal line is called transverse.
- **Oblique fractures**: Any fracture that forms an angle equal to or more than 30° is termed oblique.
- **Spiral fractures**: In this, fracture line runs spirally in more than one plane.
- **Communicated fractures**: Here the fracture fragments are more than two in number. It is cause by a crushing or compression force along the long axis of bone.

- **Segmental fractures**: In this type, there are two fractures in one bone, but at different levels.

Atypical Fractures

- **Greenstick fractures**: it is seen exclusively in children. Here the bone is elastic and usually bends due to buckling or breaking of one cortex when a force is applied. This is called a greenstick fracture.

PRINCIPLES OF FRACTURE MANAGEMENT

1) Management of Closed Fractures Ayurvedic Perspective

First of all, the site of fracture should be bathed with cold water followed lifting up of the bone which is drooped down, raised up bone should be pushed down, moved away (from its normal place) bone should be pulled (to its place), sunken bone should be elevated; All joints, movable or immovable should be set to their normal position by these setting procedures – traction, compression, extension and bandaging by a wise surgeon.[2]

***Kusha bandhana* (or splint)-** For bandaging first *ghrit* based cloth is wrap over the area of *bhagna* then barks of *Madhuka, Udumbara, Ashvattha, Palasha, Arjuna, Vansha and Sarja* should be applied as kusha (splint) suitably. After that *Manjhistha, Madhuka, Rakta Candana* and flour of *Shali* rice mixed with *Shatdhaut ghrit* should be applied over that area.[2]

A thick bandage (of cloth) is tied over the splint tightly but not loose. Bandaging should be done every week in *saumya ritu* (cold season) on every five days in moderate seasons and on every third day in *ushna ritu* (hot seasons) or as required by the condition of *bhagna*.

Well cold decoction of *Nyagrodhadi Gana* drugs should be used for sprinkling while in painful condition, *Laghu panchamula siddha ghrit* should be used for sprinkling or the learned surgeon should use lukewarm *Cakrataila* for sprinkling.

***Asthipoorana* (Bone Grafting)-** As per the classic version, in compound fractures, multiple fractures, and irregular fractures where the fractured part is totally separated or missed in those conditions, one has to fill the missing part by *Sudhavarga dravyas* (materials possessing mineral calcium). The paste prepared from the combination of *Sudhavarga dravya*, decoction of manjistha (*Rubia cordifolia),* and latex of the Banyan tree (ficus benghalensis) was used as a graft material. After the filing up the area, medicated oils are applied for proper acceptance

and healing of the bone.[6]

***Chakrayoga* (Skeletal Traction)**- In long bone fractures, the fractures of the shaft, hairline fractures, oblique fractures and in compound open fractures, there is the reference of using of *Chakrayoga*. As per the reference, in dislocation of joints, skin traction was practiced.[6]

***Kapatashayana* (Fracture Bed) *Vidhi*-** This method of immobilization was used in the fracture or dislocation of the thigh, hips, ankle, shoulder, spine, spinal column, bones of thorax, and axillary regions. In this method, the patient was laid on a multi holed bed where the affected part is immobilized using five wooden pegs.[6]

2) Management of Compound Fractures

***Ayurvedic* Perspective**

In case of fractures associated with a wound, the wound should be treated first with honey and *ghrit* and astringent drug pasted on it. Later the treatments of fracture adopted. Muscles of wound which are hanging loose are smeared with honey and *ghrit* and pushed into the wound and bandaged. Noted that they are in good shape and correct place, the wound should be dusted with the powder of either *Phalini, Lodhra, Kaṭphala, Samanga* and *Dhataki* or of *Panchavalkala* added with honey and *sukta* (sour gruel) or with powder of *Dhataki* and *Lodhra*. By this the wound heals quickly.[3]

If fracture is having a wound, the wound should be smeared with mixture of *ghrit* and more of honey, then decoction of drugs poured on it warm and then treatment indicated for fractures adopted. Medicated fats described in the treatment of *Vatavyadhi Chikitsa* may also be used here.[5]

Modern Perspective[4]

Treatment of a fracture can be considered in three phases- Phases1(Emergency care)-it consists of RICE Phases2(Definitive care)-it consists of RIP Phases3(Rehabilitation of a fracture limb).

Phases-1 (Emergency care)- RICE

1. **Rest**-Rest to the fractured part by splinting. The advantages of splinting are-Relief the pain. Prevention of further damage to skin, soft tissues and neurovascular bundle etc. Prevention of complication such as fat embolism, hypovolemic shock.
2. **Ice therapy**- It helps to reducing pain and swelling.

3. **Compression-**A crepe bandage is applied over the injury part.
4. **Elevation-**the limb is elevated so that the injured part is above the level of the heart.

In the emergency department-Soon after a patient with trauma is received in an emergency department. The patient is stabilised before any definitive orthopaedic treatment is carried out. Particular attention is paid to head injury, chest injury and abdominal injury. In a case with suspected head injury narcotic analgesics should be avoided.

Phases-2 (Definitive care)-the three fundamental principles of treatment of fracture are **RIP**

1. **Reduction** is the technique of "setting" a displaced fracture to proper alignment. This may be done non-operatively or operatively, so called close and open reduction respectively.
2. **Immobilisation** is necessary to maintain the bone in reduced position. This may be done by external (POP etc.) or internal fixation using rods, plates, screw etc.
3. **Preserve the function** by physiotherapy all throughout the treatment, even when the limb is immobilised, is necessary.

Not all the three-fundamental principle of treatment apply to all fracture such as

- Some fracture (e.g., fractured ribs, scapula) need no reduction or immobilisation. Simple analgesics and splinting are needs for the initial few days.
- *Treatment by immobilisation alone*-fracture without significant displacement or fracture where the displacement is of no consequence (e.g., some fracture of surgical neck of the Humerus) are treated this way.
- *Close reduction and percutaneous fixation*-which though can be reduced by closed manipulation but are unstable such fracture fixed with percutaneous device such as K-wire, rush pin etc., which hold the fracture in position.
- *Open reduction and internal fixation*-there are some fractures, such as intra-articular fractures, where accurate reduction, stable fixation and early mobilisation are very important to regain joint functions. Such fracture is best treated by open reduction and internal fixation.

Reduction- Reduction of a fracture can be carried out by one of the following method;

1. **Closed manipulation**-This is the standard initial method of reduction most of the common fracture. It is usually carried out under general anaesthesia and requires experience.

2. **Continuous traction**-It is used to counter the forces which will not allow reduction to happen or would cause re-displacement. A common example is that of an inter-trochanteric fracture, in which the muscle attached to different fragment cause displacements.
3. **Open reduction**-In this method, the fracture is surgically exposed, and the fragments are reduced under vision. Some form of internal fixation is used in order to maintain the position.

One reason to do open reduction is when other methods of achieving reduction have failed.

Phases-3 (Rehabilitation of a fracture limb)-It consist of joint mobilisation, muscle re-education exercises and instruction regarding gait training.

1. **Joint mobilisation**-To prevent stiffness, the joint should be mobilised as soon as possible. This is done initially by passive mobilisation. Once the pain reduces, patient is encouraged to move the joint himself with assistance.
2. **Muscle re-education exercises**-Because of lack of use, the muscle get wasted quickly. Hence, it is desirable that muscle activity be maintained all through the treatment. This can be done even during immobilisation (static contraction) or after removal of external immobilisation (dynamic contraction).

CONCLUSION

In *Ayurveda* "*Bhagna"* stands for both *Kandabhagna* (Bone Fracture) and *Sandhimukta* (Joint Dislocation) as *Bhagna* stands for "Break in Motion" which is a primary symptom in both *Kandabhagna* and *Sandhimukta* while Modern Science, under Fracture focuses only on Bone Fracture. Both Ayurveda and Modern, etiologically points towards Traumatic cause of *Bhagna*/Fracture but Modern also focuses on Pathological cause of fracture. Talking about classification, *Ayurveda* again classifies *Kandabhagna* and *Sandhimukta* into many sub-types on the basis of anatomical changes occurring in the joint or in the bone while Modern classifies Fracture on the basis of aetiology, structural change in the bone, presence or absence of external wound, complexity of fracture, pattern of fracture, etc. The Diagnosis of *Bhagna* in early era was made on the basis of *Lakshan* (Sign and symptoms) and *Pariksha* (Examination) while in Modern era diagnosis is far more easer due to modern diagnostic tools like X-ray, CT-Scan, etc. When talking about management and treatment of *Bhagna*/Fracture, the basic concept remains the same i.e. *Anchana* (Traction), *Peedana* (Manipulation), *Sankshepana* (Opposition and Stabilization), *Bandhana* (Immobilization), the Four *Sutra* of

Bhabna Chikitsa (‘four principals of treatment’) which leaves no space for other principal to get into and when read conceptually Modern treatment has no difference to be highlighted. Along with the ‘four principals of treatment’, Ayurveda also explains about different methods to be employed for different *Kandabhagna* and *Sandhimukta*, such as *Kushabandhana, Asthipoorana, Chakrayoga, Kapatashayan, Panchangi Bandh, Swasthik Bandh,* etc. Along with above specifications, *Ayurveda* also provides many medicines to fasten the healing process and subside *Bhagna* related symptoms. The above article highlights similarities and differences between Traditional Indian Medicine and Modern Medicine and we can say that orthopaedics in traditional Indian medicine was well evolved and widely employed with desired results. The concepts, theories, and techniques practiced several thousand years ago hold true even in today’s practice.

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