

A Scientific Description of Orthopedic Injuries in Ayurveda

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Abstract

Ayurveda is age old medical science in India which is time tested and is still very relevant. Some of the treatment principles of Ayurveda still hold true despite of many fold increase in technology and advancement in researches in recent times. One of such examples is in the description of bone and joint injuries and their management, which is commendable as facilities like radiology and potent anaesthetic and analgesic agents were not available in that era. The bone and joint injuries have been dealt with in a very scientific manner especially by AcharyaSushruta. Although other texts like Madhavanidan and Ashtangasangraha also contains the similar descriptions. This article explains the authenticity of text described in Ayurvedic literature and relevance of the treatment principles in modern age.

keywords:-Bhagna , Sandhimukta , Bandhana

INTRODUCTION

ORTHOPEDIC INJURIES IN AYURVEDA

The orthopaedic injuries are elaborately described in ancient texts of Ayurveda. The most scientific and systematic approach is described in most reliable text dealing with surgical entities in the ancient era i.e SUSHRUTA SAMHITA¹. It is believed that AcharyaSushruta gained this knowledge from venerable Dhanwantri and he elaborated the practical aspects of knowledge².

The bone and joint injuries have been dealt with in a very scientific manner by AcharyaSushruta and although there were no advancements like radiology and modern anesthesia, it is commendable that many of his treatment principles are still relevant after thousands of years. He has described injuries pertaining to bones and joints in Nidansthana and their management in Chikitsasthana.

Classification Of Skeletal Injuries³:-

These were grossly divided into 2 types - Kandabhagna (Fractures) and Sandhimukta (dislocation of joints)

ASHTANGA HRDAYAM has described the other classification⁴:- Sandhigata (pertaining to joint) and Asandhigata(other than joint).

Etiology Of Skeletal Injuries (Nidana)⁵:- falling from height, squeezing the body gently, hitting, beating , very vigorous movements, animal bites and other assaults/ injuries.

Description of skeletal injuries/ fractures (i.e Kanda bhagna)⁵ :-

Despite of lack of facility of X- rays , it is commendable that twelve different types of fractures have been explained which are as follows :- Karkataka, Ashwakarnaka, Churnita, Piccita, Asthichhallita, Kandabhagna , Majjanugata, Atipatita, Vakra, Chhinna, Paatita and Sphutita.

General Symptoms (SamanyaLakshan)⁵ :-

Profound swelling, inability to bear tapping, rotating and touching, producing sounds on being pulled or squeezed, affected part of body hanging down loosely, various kinds of pain and not finding comfort in any position are the general symptoms of fracture of shaft of bone.

According to AshtangaHrdaya⁴ :-

1. Features of SandhigataBhagna- inability for expansion and contraction (extension-flexion) and dislocation of joint.
2. Asandhigatabhagna – profound swelling, severe pain in all positions, inability to perform slight movement, production of cracking sounds on rubbing.

Specific Symptoms Of Each Kind (VisheshLakshan)⁵ :-

1. **KarkatakaBhagna** :- The two(broken) ends of the bone are moved apart and there is bulging in the middle resembling a tumour. *It resembles the condition of fracture associated with hematoma formation, clinically.*
2. **Ashwakarnaka** :- The ends of bones are raised up, appearing like ear of horse. *Clinically it resembles Spiral fracture⁶.*

3. **Churnita** :- On palpation, it produces sound as though broken into pieces. *Clinically, may be correlated to Comminuted fracture as there are crepitations due to multiple broken fragments of broken bone.*⁶
4. **Piccita** :- The bone at the site of fracture becomes thick and has profound swelling. *Clinically the condition resembles Compression fracture.*
5. **Asthichhallita** :-One part is above and other felt below or at sides of the joints. *Clinically it resembles the features of sub periosteal fracture.*
6. **Kandabhagna** :- The ends of bone move at fracture sight (fragments are moveable/shaky). *Clinically resembles Transverse fracture in which there is complete breach in continuity of bone.*⁶
7. **Majjanugata**:- Apart of bone or middle portion of bone getting into bone marrow. *Clinically it resembles Impacted fracture (one fragment gets impacted into/is wedged into other broken end)*⁷.
8. **Atipatita** :- The entire bone is broken into pieces without any remainder. *Clinically may be correlated to Complete fracture.*
9. **Vakra** :-The bone is bent inwards or become curved without getting detached. *Clinically resembles Green stick fracture found in children.*⁸
10. **Chhinna** :-The bone is broken from one side. *It indicatesIncomplete fracture.*
11. **Paatita** :-The bone is split into many small pieces and having pain. It can be taken asCracked fracture/ Comminuted fracture.
12. **Sphutita** :-The bone is more swollen, feels as though filled with thorns and is greatly split.*It can be compared with Fissured fracture.*

Along with the specific features of different fractures, the type of injuries/ deformities that occur in different type of bones is well explained in Ayurveda :- *Cartilagenous bones (Tarunasthi) become bent, hollow bones (Nalakasthi) means long bones break, flat bones (kapaalasthi) get punctured and teeth (Ruchakasthi) become cracked.*⁹

GENERAL SIGNS SYMPTOMS OF DISLOCATIONS (SAMANYA LAKSHAN)²

Inability to perform actions such as extension, contraction , rotation and vigorous movements, severe pain and inability to withstand touch (guarding).

SPECIFIC SYMPTOMS OF DISLOCATIONS (VISHESHA LAKSHANA)²

1. **Utpishta** :-Swelling on both sides of joint and pain. Different kinds of pain appearing especially at night.It can be compared to features ofFracture dislocation.

2. **Vishlishta** :-Slight swelling , continuous pain and improper functioning of joint. It can be compared withSubluxation or Incomplete dislocation¹⁰.
3. **Vivartita** :-Joint is shifted to any one side resulting in distortion of part and pain. It can be thought asDislocation with lateral displacement.
4. **Avakshipta**:- Drooping down of the joint and pain. It can be compared withDislocation with downward displacement.
5. **Atikshipta** :-Both the bones forming the joint are moved apart and there is pain. It can be compared with dislocation with overriding of bones¹⁰.
6. **Tiryakkshipta** :-Any one of the bones of the joint is displaced to the side and produces pain. – Dislocation with oblique displacement.

PROGNOSIS OF BONY INJURIES (SADHYA-ASADHYATA)¹¹ :-

Four out of twelve fractures are told difficult to cure. They are *churnita, chhinna, atipaatita and majjanugata*. Prognosis also depends on physical condition of the patient fractures occurring in extremes of ages , emaciated patients, those suffering from leprosy/ dyspnoea and the patients having injuries to lungs or near the joints are difficult to cure. Patients consuming less quantity of food , who do not maintain proper lifestyle, having vata predominance and those with complications are difficult to cure.

POOR PROGNOSIS PATIENTS :-Fractures pertaining to bones of head and pelvis especially the crushed fractures of scalp bones, fractures found in between the breasts (sternum) , in temples, back and head should not be treated. Fractures found in congenitally deformed bones and joints , or deformity developed due to improper management or bandaging shall be rejected.*Actually , these fractures were not curable in the ancient times because of lack of required technology.*

FRACTURES WITH GOOD PROGNOSIS :- Fractures of middle age people are easily curable.

Dietary advice for fracture patients¹¹ :-

Foods to be avoidedsalty, pungent , alkaline , sour and dry foods. Other than this copulation, sunlight and physical exercises shall be avoided.

Advisable / beneficial foods :- shali (rice), meat soup, milk, ghee soup of satina (lentil) and foods/ drinks which are stoutening, grstikshira (milk of cow which has delivered within 7 days)) shall be given regularly to the patient by adding laksha, fresh ghee and drugs with sweet taste.

MANAGEMENT OF FRACTURES¹²

GENERAL PRINCIPLES OF DEALING WITH FRACTURE/DISLOCATION:-

In case of fractures with displacement and joint dislocations, different manipulations have been explained to reduce them and place them in their normal position. Various manipulations like downward or upward pulling (elevation), extension, flexion, rotation or pressure shall be applied as per the type and site of fracture or dislocation. *So it's very clear that the approach of management was very scientific in that era, but because of unavailability of facilities like radiology and good anaesthetic agents, the procedures were painful and only close reduction could have been managed. Thus the compound fractures were untreatable.*

General Steps of Management:-

1. *Kushabandhan (splints)* – To immobilize the joints, barks of various trees like madhuka, udumbara, ashwatha, palasha etc. were used. *In present era also splinting is used as first measure to give rest to the part.*¹³
2. *Alepa (paste /plaster)*-manjistha, madhuka, raktachandan, shatdhautaghrta were used.
3. *Bandhan (Bandaging)* – bandages are advised to change according to season and weather. e.g once in 7 days in winters and every 3rd day in summers/ hot weather. Firm bandage with adequate pressure is advised to keep the fragments immobilised. Very loose and too tight bandages shall be advised to avoid complications.
4. *Parisheka (bathing the area)* – According to doshas the decoction of drugs should be used. Decoction of nyagrodha, lukewarm chakratali, and specifically for analgesia milk boiled with panchamula shall be used.

Expected time for healing of fractures :-

Fractures take more time for healing with the growing age. Fractures of childhood get healed within a month and in old patients take 3 months to heal. This is because of osteoporosis and degeneration changes in body.

MANAGEMENT OF SPECIFIC CASES

- I. *Savranabhagnachikitsa (wound management in a Compound Fracture)*
Wound should be smeared with a mixture of ghee and honey, afterwards it should be covered with a paste of astringent drugs, fractures shall be treated accordingly.
- II. *Fractures with dislocations and joint dislocations :-*

Fragments / bones should be placed in position by needed manipulation according to type and place of fracture /dislocation.

Cases where traction is to be avoided :-Dislocations with associated fractures of bones surrounding the joint should not be manipulated as it may increase the dislocation and fractures become complicated to manage. Utpishta and Vishlishta types should not be manipulated. Such cases shall be managed by bathing with cold liquids, warm poultice, splints and bandages as per the need.

Management of injury to Nakhasandhi(fractures of distal phalanx) :-

In case of crushing of nakhasandhi accompanied with accumulation of blood, it should be punctured with an Ara (thick needle) and finger tip should be covered with moist flour of rice and bandaged. It will give rest and time to heal to the part.

Fractures pertaining to anguli (finger)-It includes fractures of phalanx and dislocation of Inter phalangeal joints :-

After repositioning the fragments finger should be tied round with band of thin cloth and then bathed with ghee.

Padatalabhagna (sole) :-Talabhagna (fractures of sole/ metatarsals) should be treated by anointing the foot with ghee, kushabandhan (splintage) and bandaging (immobilisation). Rest to the part.

Jangha and Urubhagna(foreleg and thigh) :-

Fractures pertaining to the leg should be anointed with ghee, pulled forward, placed in normal position and then splints and bandages applied. When urvasthi (femur) is protruding out after cracking / crushing type of fracture- it should be pulled forward using a wheel and leg bandaged. It will give traction to reduce the fracture. *Presently also skin or weight tractions are used.*¹⁴

Kapatashayan inJanghaurubhagna(fractures of thigh and leg) :-

In fractures of lower limbs, Kapatashayan is beneficial (i.e. lying in a specially made wooden box) having 5 pegs to fasten the patient tightly without allowing movements of the affected part, two pegs on either side and one peg down the heel. *This was the arrangement made to immobilise the part to aid in healing of fracture and reduces the pain. Similarly now a days splints are used*¹⁴.

Even in cases of fracture or dislocation of bones in shroni (pelvis), prsthavansha (vertebral column), vaksha (chest) and akshaka (clavicle) – same treatment of kapatashayan was adopted. *It was the*

alternative arrangement for specialised stretchers like scoop stretchers¹⁵ used now a days for spinal injury cases.

Hasta talbhagna(fracture of metatarsal) :-

Both the palms should be made similar after correcting the fracture, afterwards area is bathed with raw oil and bandaged. Afterwards patient is instructed hold a ball of mud, salt and stone respectively for few days. *Ball holding is for exercise of hand muscles to regain the grip power. Presently, physiotherapy is advised for same purpose.*

Bahubhagna(fractures of arm) :- they should be treated in same manner as fractures of thigh.

Katibhagna(Fractures of pelvis / lumbar vertebrae) :-

Fragments should be manipulated to bring to its normal position and bandaged. Afterwards enemas (basti) shall be administered. According to Ayurveda basti is best way to treat vatadosha and kati is mentioned as seat of vata.

ParshukaBhagna(Rib fractures) :-

Chest should be strapped by applying bandage from right or left side as per the requirement after placing the kavalika (gauge) in between the bandage. The patient shall be made to lie in cauldron or bath tub filled with oil. *This will give analgesic effect and hasten the healing as the oil is best vatashamak.*

Nasabhanga(fracture of the nose) :-

When the nasal bones get fractured / displaced or sunk inside, they should be lifted with help of an hollow tubes or iron rod introduced into the nostrils anointed with ghee , bandaged and then bathed with ghee.

SirahKapalabhagna (fractures of Skull bones) :-

In simple fractures of skull bones without displacement, when there's no oozing of brain matter / CSF , then the area should be covered with honey and ghee and bandaged. Orally only ghee is given to the patient for one week.

MANAGEMENT OF DISLOCATIONS OF JOINTS OF LIMBS¹²

AnsadiSandhicyuti(dislocation of shoulder joint):-

The upper part of humerus should be lifted up from axilla using a wooden rod and placed in its normal position and with swastika bandage (Figure of 8). *In present era, chest arm bandaging is applied to immobilise the joint.*

Dislocation of Elbow and wrist joint :-

The dislocated elbow should be kneaded by the fingers and placed in its normal position. Extension and flexion done to check the mobility, then warm oil poured over it in a stream. Similar treatment should be done in dislocations of knee, ankle and wrist joints.

Akshkashthicyuti (dislocation of clavicle) :-

In dislocation of clavicle the area should be given fomentation and then lifted up using a wooden pestle or pushed down as per the need and then tight bandage applied.

Grivavivrtti– (This is probably for fracture of cervical spine) :-

When the neck is found twisted or sunk into the chest, then the physician should hold the head at the avatu(nape of the neck) and hanu (lower jaw) and pull the neck upwards, apply splints suitably and then bandage it with bands of cloth. The patient is instructed to sleep keeping his face up for 7 days. *Now a days cervical collars are used to immobilize the neck.*

Hanusandhicyuti(dislocation of Temporomandibular joint)

When the joint of lower jaw is dislocated , the physician should anoint the area , give fomentation and place the jaw in normal position (by physical manipulation). Then apply Panchangibandha(Five tailed bandage). Instilling drops of oil processed with vata mitigating and sweet drugs into the nose (nasya) is very beneficial.

Shunangachikitsa(treatment of oedema) :- When there is oedema in any part of body without a wound as a result of trauma or assault, the paste of cold potency drugs should be applied or cold liquid poured over it.

Logic – cold fomentation or application of cold items will cause local vasoconstriction, thus will help in removing swelling and will anesthetise the part to reduce pain.

MANAGEMENT OF COMPLICATIONS OF FRACTURES :-

Malunited fractures - If long bones are mal-united after healing then the fracture ends should be broken again and placed properly and then treated like a fresh fracture. *Presently also mal-united fracture fragments have to be treated likewise e.gosteoclasia or redoing the fracture surgically¹⁶.*

Compound fractures (savranabhagnachikitsa)- when there is wound at the site of fracture, the pieces of dry

bone projecting out, should be cut and removed taking care not to make another wound nearby. Afterwards treated as fracture with a wound.

Supplementary treatments

For fractures pertaining to upper part of the body, therapies such as Mastishka (sirobasti) and Karnapurana (filling the ear with medicated oil) are beneficial. For fractures pertaining to bones of extremities ghrítapan (drinking of medicated ghee), nasya (nasal drops) and anuvasana (oil enema) are helpful. *All these therapies pacify vata thus reduce pain and give strength to body.*

Medications useful in cases of fractures :-

1. *Gandha tail (oil)* – It is very useful in all kinds of fractures. Other indications are :- convulsions, hemiplegia, facial palsy, lock jaw etc.
Routes of administration – oral, anointing, nasal, rectal (enema).
2. Some other oils having similar benefits :- oils prepared from trapusa, aksa and priyala cooked with vasa (muscle fat) and milk are very beneficial for quick healing of fractures.

Advice to prevent infection – infections must be prevented otherwise fractures become very difficult to cure. Infected fractures may lead to suppuration of muscles, vessels and ligaments. *It indicates that ancient Ayurvedic scientist had concept of maintaining asepsis and in this phrase they have indicated towards complications of compound fractures.*

Features of proper union of fractures:-

Anatomical normalcy (i.e. no deformity or irregularity), painless full and free movements of the affected part are suggestive of proper union of fractures. *In that era, clinical examination and assessment was the only option as the facilities of radiology were not available.*

CONCLUSION

Thus, it is clearly evident that despite of lack of facilities like radiology and absence of potent anaesthetic agents, antibiotics and analgesics, the

Ayurvedic surgeons especially Acharya Sushrutadid a tremendous work in the field of orthopaedics and described the bone and joint injuries in a very scientific and elaborative way. It is a myth that Ayurvedic clinicians don't have the in depth knowledge of skeletal injuries and accidental/ trauma cases cannot be dealt with by Ayurvedic clinicians. Rather the fact is that Ayurveda has a rich heritage of elaborated knowledge for dealing with trauma cases.

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