



Ayurvedic and modern perspective of *Asthibhagna*- a conceptual study

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ABSTRACT -

Acharya sushruta has mentioned detailed diagnosis and management for all orthopaedic injuries under the heading bhagna. This study explores the concept of asthibhagna, the traditional system of fracture management, and compares it to the understanding of fractures and their treatment in the modern times. Today we are able to examine the fractured bone directly under radiological examination. In absence of this, sushruta had evolved this useful and more logical of determination of types of fracture by inference, and their management through traction, manipulation by pressure, by reduction and immobilization. Many of the principles of fracture treatment defined centuries ago are still relevant and used in the conventional fracture management. The modern medicine takes over in the management of complicated, simple and compound fractures with the introduction of many surgical interventions like the intramedullary devices that hasten fracture union and healing potential. The use of specific type of splints in form of the bark of different trees, the use of decoctions and the role of diet are the distinguishing features of traditional treatment. it would be worthwhile to explore these unique features for use in the present times.

Keywords: *Fracture, Bhang, Sushruta, Asthi.*

INTRODUCTION:

Ayurveda is a complete science of life where we get elaborate description about prevention and management of disease. Ayurvedic systems of medicine do not limit themselves to just fulfilling the needs of primary health care, but also reach out to certain specialised areas. One such popular but little known area is that of fracture management. Today we are able to examine the fractured bone directly under radiological examination. In absence of this, sushruta had evolved extremely useful, logical and detailed methods of determining the types of fractures and their management.

The principles laid down by the ayurvedic text are so relevant that they are practiced even in the present times by the modern orthopaedic surgeons.

In traditional ayurveda practice, the fracture of bones and their treatment was first mentioned in sushrut samhita nidana sthana and chikitsa sthana from the view of surgical management of in 1500 B.C. Many interesting facts have been described in ancient ayurvedic classics on the management and treatment of fractures including different kinds of bandages and slings to be used.

This study helps to explore the hidden skills, power and methods of identification and treatment of fractures according to ancient times and simultaneously comparing it to the understanding and treatment of fractures according to the highly evolved and accepted modern medicine.

Such a study could potentially arouse interest as well as broaden the limited vision of main field conventional medicine professionals to the little known ancient techniques and methods of treatment.

AIMS AND OBJECTIVES:

The aim of this study is to compare the concepts of diagnosis and management of fractures (Asthibhagna) from the point 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.

AYURVEDIC PERSPECTIVE:

Fracture is termed as "Bhagna" in ayurveda which means breach/break in movements/continuity of bone. Bhagna is of two types' sandhimukta or dislocation and Kandabhagna i.e. bone fracture.

MODERN PERSPECTIVE:

Fracture is a break in the surface of bone, either across its cortex or through its articular surface.

ETIOLOGY

AYURVEDIC PERSPECTIVE-

Breaches in movements of bone are of several types according to the nature of injury such as by slip, pressure, striking, excessive movements, bites of ferocious and other animals such tiger etc. Breaking of bones are said to be of many

kinds caused by trauma of different types such as falling, squeezing, pulling with force, and bite by wild animals etc. Its location is at two places viz. Sandhi- at joints, Asandhi- at other places apart from joints. Bones get broken from a fall from height, assault etc. It is of two kinds as sandhigata- localised in the joint and asandhigata- in places other than joints.

MODERN PERSPECTIVE-

- Fractures can happen in variety of ways, but there are common causes:
- When the force on the bone is too large and occurs suddenly as in road traffic accidents, fall etc.
- When the force on the bone is chronic and repetitive e.g. prolonged standing as in a policeman, nurse, etc.
- When the natural resistance of the bone is eroded by a disease process (e.g. tumour, infection, osteoporosis etc.) that a bone succumbs to the insult and breaks. When the bone breaks, it is bound to injure the surrounding soft tissues like muscles, ligaments, etc.

AYURVEDIC PERSPECTIVE SYMPTOMS:

Excessive swelling, inability to bear shaking, movement and touch, crepitus on pressure, looseness of the part, appearance of various types of pain and no relief in any position. profound swelling, throbbing pain, twisting pain, intolerance to touch (guarding), sound produced on squeezing, drooping down of the part, severe pain in all position.

profound swelling and severe pain in all positions, inability to perform even slight movement, production of cracking sound

on rubbing are the features of fracture in brief.

In all these kinds general features found are; drooping of the part, swelling and sever pain, crackling sound on movement, tenderness, pulsating or pricking pain, without comfort in any position.

Drooping down of the body part, swelling, pain increasing greatly, increase of discomfort day after day, slight sound coming up at the site of fracture when touched, intolerance to touch (guarding), pulsating and pricking pains, not feeling comfortable in any position- are the symptoms of fracture.

MODERN PERSPECTIVE SYMPTOMS:

- Pain: this is 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 fracture and less in dislocation for obvious reasons.
- Deformity: patients with displaced fractures and dislocations usually present with deformity of varying severity.
- Inability to use affected part is another frequent complaint.

SIGNS

- Tenderness: this is an important clinical sign in bone and joint injuries and it is usually seen after trauma. Importance of tenderness methods of elicitation and grading is mentioned in the box.

- Swelling: the swelling is examined for shape, size (mild, moderate, sever), consistency (cystic, hard, soft), tenderness, fluctuation, etc.
- Deformity: this is usually seen in displaced fractures and dislocations, un-displaced fractures, mild strains and sprains show no deformities. Some of the deformities are very characteristic and specific and help in making a spot diagnosis.
- Abnormal mobility between fracture fragments is a sure sign in fracture.
- Loss of transmitted movements: when one end of the limb is rotated, it automatically 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 the end of the clinical examination.
- Shortening: limb shortening of various degrees is common in bone and joint injuries.

CLASSIFICATION OF FRACTURES AYURVEDIC PERSPECTIVE:

There are 12 types of fractures such as- *karaktaka, ashvakarna, churnita, pichhita, asthichhallita, kandabhagna, majjanugata, atipaaita, vakra, chinna, paaita and sphutita.*

Features are as follows- at both ends of the bone there is hyperaesthesia and in the middle fracture point is raised like a cyst this is known as karkataka. That projected

like horses ear is ashvakarnaka. If there is sound on palpation, it is churnnita. In pichhita the affection is extensive and with sever swelling. When bone is lowered and projected in sides respectively it is asthichhallit. It is kandabhagna if it moves on shaking. When a portion of bone pierces pith of the other end and digs out the other marrow it is known as majjanugata. When bone is completely it is atipatita. When bone is bent but not separated it is vakra. If one of the sides remains intact it is known as chhinaa. Patita is that which has many small cracks with pain. If the site is as if full of awns, inflamed, large and having many cracks it is known as sphutita. Karkata is specially caused by pressure from both ends of the bone making a tumour like swelling in the centre of the bone resembling a crab in appearance. Vakra is the curvature of the bone without being dislocated. Bone swollen as though full of thorns, with many fissures is sphutita. Bone broken in two parts hangs loose on touch is vellitaka. Portion of bone being lost at the side is asthichhallita. Bone bulged up like the ear of the horse is ashvakarna. Bone becoming thick and having great swelling is pichhita. Thin multiple cracks on bone associated with pain is darita. That producing sound on touch is churnnita. Broken bone getting in to the centre of another bone is atipatita. Broken bone piercing another bone from side sesita. The wound of the fracture when lifted sinking into the bone marrow is majjanugata.

Kanda bhagna is of 12 types. Namely- karkataka, ashvakarna, vichurnita, pichhita, asthichhallita, kandabhagna, atipatita, majjanugata, sphuta, vakra and two types of chinna. These twelve are the kinds of bhagna.

MODERN PERSPECTIVE

Simple or compound: the bone can break within its soft tissue envelope and may not communicate to the exterior or it may rip through its soft tissue itself may be damaged by the external forces, exposing the bone to the external atmosphere.

Based on the extent of fracture line:

- Incomplete fracture- it involves only one surface or cortex of the bone
- Complete fracture- here the fracture involves both the cortices and the entire bone. a complete fracture could be un-displaced or displaced.

Based on fracture patterns:

- Linear fracture- these could be transverse, oblique or spiral. Any fracture that forms an angle less than 30 degree with the horizontal line is called transverse. Angle equal to or more than 30 is termed as oblique.
- Comminuted fracture- here the fracture fragments are more than 2 in number. They are further sub classified in to <50% comminution or more than 50% comminution. Butterfly shaped fractures are also included in this group and could be less than 50% or equal to more than 50%.
- Segmental fractures- a fracture can be break in to fragments and the fragments could be two-level, three-level, and a longitudinal split or comminuted.
- Bone loss- this could be a <50% bone loss, more than 50% bone loss, or a complete bone loss.

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.

- Impacted fracture: here the fracture fragments are impacted in to each other and are not separated and displaced'
- Stress or fatigue fracture: it is usually an incomplete fracture commonly seen in athletes and in bone subjected to chronic and repetitive stress
- Pathological fracture: it occurs in diseased bone and is usually spontaneous. The force required to bring about a pathological fracture is trivial.
- Hairline of crack fracture: it is very fine break in the bone that is difficult to diagnose clinically. Radiology usually helps or still better is CT scan.
- Torus fracture: this is just buckling of the outer cortex.

PRINCIPLE OF MANAGEMENT:

Management of closed fractures

Ayurvedic perspective:

One should rise up the slipped down, press down, the elevated one, retract the excessively thrown out and pull out that which has moved below. All joints movable, immovable should be set to their normal position by these setting procedures- traction, compression, extension and bandaging by a wise surgeon. Barks of madhuka, udumbara, ashwathha, palasa, arjuna, vansha, sarja and vata should be collected for the use as splint. For paste manjishta, madhuka, raktachandana and flour of Sali rice mixed with ghee washed hundred times should be collected. Bandaging should be done every week in saumya, on every five days in

moderate seasons and every third day in hot seasons or as required by the condition of bhagna. Well cooled decoction of nyagrodhadi drugs should be used for sprinkling while in case of painful condition; milk cooked with panchmoola should be used for sprinkling or the learned surgeon should use lukewarm chakrataila.

Sprinkling and past should be verily be cold and prepared of dosha alleviating drugs according to time and dosha.

Bone which is drooping down should be lifted up; that raised should be pushed down, that which has moved away should be pulled, that which has sunk should be elevated. Manipulations such as rotation, squeezing, elevating, restraining the part of the body with bandages etc. should be followed. All joints of the body moveable and immovable should be placed firmly in their correct position and made immovable for restraining methods.

Then thick or thin, flat, smooth, pieces of either the bark or the wood of trees such as kadamb, udumbara, ashwathha, sarja, Arjuna, palasha or vansha are cut out. These are known as kusha and wrapped in a cloth smeared with more of ghee, and inserted (on all sides of the joint) and over them bandaging done. Bandaging should be opened at the intervals of three days in summers, of seven days in dewy seasons or at suitable time depending upon the predominant doshas in the fracture. Afterword's the area should be bathed with decoction of nyagrodhadigana made cold or with milk boiled with drugs of panchmoola; this will relieve pain. Considering the nature of place and time the wise physician should make use of chakrataila added with drugs mitigating vata, comfortably warm. Application of

drug and pouring liquids should be done continuously and in very cold condition.

First of all the site of fracture should be bathed with cold water followed by application of mud plaster and bandaged inserting kusha suitably. The bone if slide down should be lifted up and if elevated should be pulled down, if the broken end found below the bone it should be lifted up and placed in proper position. Barks of kadamb, udumbara, ashwathha, sarja, Arjuna, palasha or vansha are cut-out and should be made use of as kusha. A thick bandage is tied over the splint. it should be tight but not loose. During cold and winter seasons the bandage should be removed once in a week, and once in three days in summer days; every five days after one month or at a suitable time depending on the condition of the fracture. Manjishtha and madhuka macerated in the water, adds with shatdhauta ghreeta and flour of rice- all mixed well should be used for application over the area. Rice flour, saindhava salt and juice of ripe fruit of amlika made as a thin past and applied. It subsides the swelling and pain due to the trauma and other external causes.

Roots of aamrataka, amalki phala, shigru patra, roots of punarnava, vardhamana and kembuka- all together macerated either with kanjika and buttermilk and cooked over fire and applied as poultice relieves pain, swelling and helps in quick healing. Decoction of either nyagrodhadigana or panchmuladi gana added with milk and poured in lukewarm condition over the lesion, is beneficial to relieve pain or chakrataila may be applied. He should be provided with foods that do not cause heart burn and food prepaid from flour of grains. The fractured part which is also swollen should be carefully protected from assault

etc. it should be bathed with cold liquids constantly if there is no wound on the part.

MODERN PERSPECTIVE

Simple fractures are managed by conservative and operative methods.

Conservative methods

- For un-displaced fractures, incomplete fractures, impacted fractures;
- Cuff and collar sling for upper limb fracture
- Strapping for fracture clavicle, fracture rib, finger of toe fracture etc.
- Plaster slabs; plaster of Paris slab can be used to support the injured limb usually as a first aid measure.
- Rest. and NSAIDs for pain relief and to reduce the inflammation.
- Masterly inactivity in certain cases like impacted fracture neck of femur, etc.

For the displaced fractures here the aim is to restore back the normal anatomy of the bone by either open or closed reduction.

Management of fracture by closed reduction:

- This consists of resuscitation, reduction, rotation and rehabilitation
- Resuscitation: resuscitation is the topmost priority if the patient is in shock following a fracture.
- Reduction of the fracture fragments if it is displaced. Usually it is done under general anaesthesia after adequate radiographic study.

Reduction methods are:

- Closed reduction: it is adopted for simple fractures. The technique followed is traction and counter traction. It is a blind technique and needs considerable skill and

expertise. It commonly results in malunion.

- Continuous traction: certain examples where continuous traction can be used for reduction of fractures are gallow's traction for fracture shaft femur in children, balanced skeletal traction for adult shaft femur fractures, etc.
- Open traction: it is done when the above methods fail or if there are specific indications such as:
 - Displaced intra-articular fractures
- Type 3rd and 4th epiphyseal injuries
- Major avascular fractures
- Non-union
- Replantation of extremities
- Relative
 - Multiple fractures
 - Delayed union
 - Loss of reduction
 - Pathological fracture
 - For better nursing care
 - To avoid prolonged bed rest
- Retention: once the fracture fragments are reduced, it has to be retained in that position till the fracture unites; otherwise it tends to get displaced due to the action of muscles, gravity and inherent factors.
 - Retention methods after closed reduction are:
 - By plaster of Paris splints this is the most common splint employed. It could be a slab(encircles half the limb) or cast(encircles the whole limb) or a functional brace(which permits the mobility while the fracture is still under the cast)
 - By continuous traction to overcome the muscle force after the closed reduction. The traction

could be skin or skeletal traction and is employed as fixed, balanced or combined types of tractions.

- Use the functional braces these can be used after three weeks, once the fracture becomes sticky.

Rehabilitation: it is by way of physiotherapy and exercises (both active and passive)

Methods of open reduction:

After the exposure, the fracture is reduced by direct methods and fracture is reduced without exposing by positioning and traction over the fracture tables, skeletal traction, tensioner, lamina spreader, etc.

Principles of open reduction (known after lambotte)

Suggested by lambotte includes:

- Exposure: the fracture is adequately exposed through a proper approach.
- Reduction: of the fracture fragments under direct vision is carried out.
- Definitive stabilization: of the fracture by using plates and screws or intramedullary nail, etc. is done later.
- Temporary stabilization: by K-wire is done first if necessary.

Retention after open reduction:

After the open reduction the fracture fragment invariably needs to be fixed internally by various implants such as k-wires, screws, intramedullary nails, plates and screws, interlocking nails, hip implants, spine implants, steel wires.

The rehabilitation process is same as for closed management of fractures.

MANAGEMENT OF COMPOUND FRACTURES:

Ayurvedic management:

In case of compound fracture the wound should be treated with past of

plants mixed with plenty of ghee and honey. The remaining regimen should be as in fractures. In case of fractures associated with wound, the wound should be treated with ghee, honey and astringent drugs placed on it. Later the treatment of fracture is adopted. Muscles of wound which are hanging loose are smeared with honey and ghee and pushed in to the wound and bandaged. Noted that they are in good shape and correct place. The wound should be dusted with powder of either phalini, lodhra, kataphala, samanga and dhataki or of panchvalkala added with honey and sukta (sour gruel) or with powder of dhataki and lodhra. By this the wound heals quickly.

In case of fracture with wound the wound should be bathed with decoction of drugs. Astringent taste added with more of honey and ghee. Remaining treatment is like that described for fractures. Muscles which are hanging loose in the wound should be smeared with honey and ghee and then cut, sutured and bandaged appropriately. Observing that these are well adhered, fine powder of phalini, lodhra, kataphala, samanga and dhataki: or of dhataki and lodhra should be sprinkled over them; by this the wound heals quickly.

If the fracture is having a wound, the wound should be smeared with mixture of ghee 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 vatvyadhi may also be used here.

MODERN PERSPECTIVE:

Compound fractures are usually serious injuries and are due to high-velocity trauma. They may be associated with multisystem and multiskeletal injuries. The

approach should be more cautious and the following protocol is recommended.

- General physical examination: this is of vital importance since the patient is usually in shock. Levels of consciousness, pulse, blood pressure etc. should be recorded.
- Examination of other systems: examinations should be carried out for head injury, neck and face injury, chest injury, blunt injury abdomen, pelvic fractures and spine fractures.

TREATMENT PLAN:

After stabilizing the general condition of the patient, surgical debridement is planned under strict aseptic measures in a major operation theatre. Debridement is the most important step in the management of compound fractures. It consists of the following steps.

- Exploration of the wound: the wound should be sufficiently explored proximally and distally to have a proper assessment of the extent of damage.
- Excision of all nonviable structure is important to prevent infection.
- Evacuation of foreign body to prevent the further infection.
- External fixators are used to fix the fracture fragments after debridement.

DEFINITIVE WOUND CARE:

This is an extremely important step as the primary objective of treatment in open fracture is to convert an open wound into closed wound. The wound closer should be primary or secondary.

Criteria for primary closure:

- All necrotic material should be removed
- Circulation should be normal

- Nerve supply should be intact
- Patients general condition should be stable
- Wound should be closed without tension
- No dead space should be left after closer
- There should not be any multisystem injury.

If all the above criteria are met, primary suturing is preferred to close the wound. The following alternative measures are considered in the event of the above criteria not being met.

- Splint skin graft
- Pedicle or flap graft
- Secondary suturing after 2-3 weeks
- Relaxing incisions to mobilise the neighbouring skin.
- Biological dressing(homologous or heterologous skin)
- To live it open and follow by regular dressings, wound inspection and closer later.

Role of antibiotics:

It will not replace the wound debridement. Topical antibiotic have very little role. Parenteral administration is recommended. The choice of antibiotics is usually is broad spectrum.

Role of AGGS and ATS:

The patient has to be protected against tetanus and gas gangrene by effective immunization against them.

COMPLICATIONS AND DEBRIDEMENTAL FACTORS:

AYURVEDIC PERSPECTIVE:

Out of them (fractures) churnita, china, atipatita and majjanugata are curable with difficulty. If pelvic bone is cracked, dislocated, drooped and rubbing the pubic region, it should be discarded. If the skull is not unified, forehead is smashed and

there is fracture in intermammary region, it should be discarded. The surgeon should remain vigilant and take all necessary steps so that it does not suppurate because in case of suppuration of muscles, vessels and ligament it becomes difficult to cure. Bhagna is cured with difficulty if patients eat little, has no self-control, is of vaatika constitution or is afflicted with complications.

The patient of bhagna should abstain salts, pungent, alkali, sours, coitus, sun-heat, physical exercise and rough food.

Darita, churnita, atipatita, sesita and majjanugata are difficult to cure in the emaciated, the very young or very old, who can't with stands the therapies, who eats too much, who have predominance of vata, who are suffering from leprosy and complications. Bhinna kind of fracture of katikapala or dislocation, uptista fracture of the bone of the jaghana, vivartita kind of kurpura, churnita kind at lalata (forehead), that causing separation of the kapala and that happening between the head and the back of the temples- all these are incurable. By loose bandaging the immobilization of joint is not achieved and by tight bandaging there will be severe pain, burning sensation, ripening and swelling.

The bone which has been crushed in very small pieces, that which causes sound on touching, in which pieces of bone have entered the marrow cavity, the condition whereby trauma very little portion of bone is left inside the body, that condition in which raising the fracture portion makes it sink into the marrow- all these kinds are difficult to cure; so also those found in persons who are emaciated, debilitated, having predominance of vata in their body and who consume very little food. Fracture of the pelvic bone in its fat portion, dislocation of joints of the waist

and crushing fractures of the pubic bone should be refused. Skull bone not knit together, the forehead bone broken to pieces and that fracture which has occurred in the middle of the temples, head and breast should be refused. Physician should not allow ripening in the fracture site; since muscles, veins, tendons, joints which develop pus do not stick together. Exertion is not good for him; for it will produce dislocation of the joint. The patient of fracture should not indulge in things which are salty, pungent, alkaline and sour; copulation, exposure to sunlight, dry food, exercises.

MODERN PERSPECTIVE:

CHRONIC COMPLICATIONS

- Delayed union
- Non-union
- Shortening of long bones
- Malunion
- Avascular necrosis
- Joint stiffness
- Post traumatic arthritis: it is commonly seen in the intraarticular fractures, malunion etc.

ACUTE COMPLICATIONS

- Shock
- Acute respiratory distress syndrome
- Neurovascular injuries
- Volkmann's ischemia/compartmental syndrome
- Deep vein thrombosis
- Crush syndrome

PECULIAR COMPLICATIONS:

- Infection
- Chronic osteomyelitis
- Gas gangrene
- Tetanus
- Hypovolemic shock

DETRIMENTAL FACTORS:

- Poor circulation

- Infection
- Segmental fractures
- Comminution
- Osteoporosis
- Soft tissue interposition

Unique features of Ayurvedic treatment for fracture healing:

SPECIAL DECOCTIONS:

For paste, manjishta, madhuka, raktachandana, and flour of Sali rice mixed with shatdhauta ghrita should be collected. Well cooled decoction of nyagrodhadi drugs should be used for sprinkling while in case of painful condition. Milk cooked with panchmoola should be used for sprinkling or the learned surgeon should use lukewarm chakrataila. Sprinkling and paste should be verily cold and prepared of doshas alleviating drugs according to time and doshas.

In fracture of upper part of the body i.e. mastishka ear-filling, intake of ghrita and snuffing if useful while in that of extremities enema is applicable. Gandhataila which alleviates all diseases caused by vata and is suitable for king. Oils of trapusa, bibhitaka, priyala mixed with muscle fat should be cooked with kakolyadi drugs along with 10 times milk. This excellent oil unites fracture very quickly and is used as intake, massage, snuffing, enema, sprinkling.

SPECIAL DIETARY AND HERBAL SUPPLEMENTS:

The learned surgeon should provide Sali rice, meat-soup, milk, ghee, pea-soup and weight promoting food and drugs to the patient suffering from bhagna. The patient of bhagna should drink milk of primiparous cow mixed with ghee, processed with kakolyadi drugs, well cooled and added with laksha early in the morning.

The patient of bhagna should drink ghrishtikshira (milk of the cow which has calved within a week) added with ghee and processed with kakolyadi drugs mixing it with laksha early in the morning.

Asthisamhara together with ghee, laksha, godhuma and Arjuna should be consumed with milk everyday by the patient of fracture and dislocation of joints. By consuming the paste of rasona, madhu, laksha, ghee and sugar fractures like china, Bhinna gets united quickly. Powder of shrugalvinna consumed along with soup of meat everyday heals the fracture within three weeks. Powder of Abha (babbula) Added with honey and consumed for 3 days, it helps to unite the fractures making the bone similar to diamond (in hardness). Abha, triphala, vyosha all equal parts added to guggula are pounded well and made into pills; helps in union of fracture.

FRACTURE BED:

For those having fracture and dislocation of leg and thigh, wooden cot is suitable. In this for stabilizing, five nails are provided so that there should not be any movement in the affected part. For this two nails on each side of the joint and one at the sole are fixed. This procedure should be adopted in case of fracture and dislocation of hip, vertebral column and clavicle too.

For persons having fracture of waist, legs and thighs making them lie on kapata (hard wooden plank) is ideal for restraining him. It should be well equipped with five pegs, two each for the forelegs cum thighs and flanks and one for the sole (the part of the body are tied to these pegs and thus immobilised). The same procedure should be adopted in cases of dislocation and fractures of the pelvis,

vertebral column, chest and chest and collar bone.

CONCLUSION:

Many similarities can be found both in Ayurveda and modern medicine in understanding and treatment of fractures. The symptoms of fracture as understood according to modern medicine have been mentioned centuries ago in the Ayurvedic texts. Today we are able to examine the fractured bone directly under radiological examination. In the absence of this, the ancient system had evolved extremely useful, logical and detailed methods of determining the different types of fractures and their management. Special techniques like management of compound fracture have been dealt separately. The wounds are dressed before immobilising the fracture. There is also an indication of the use of practical physiotherapy in the texts. This could be compared to the rehabilitation post fracture section in modern medicine. An interesting feature in sushruta's technique of dealing with fractures is the method of immobilising the injured limb by using fracture bed "KAPATASHAYAN". The modern medicine take over in the management of complicated, simple and compound fractures with the introduction of many surgical interventions like intramedullary devices that hasten fracture union and healing potential. Diet and application of herbal pastes and decoctions play an integral role in accelerating fracture healing. The favouring and the contra-indicated diets influence the time and quality of healing. These are indeed the unique features of Ayurvedic treatment. Properly united fracture must satisfy the condition such as absence of gaps between the broken fragments, shortening deformity, return of painless and easy

movements. If only the surgeon is convinced that these four features exist clinically, should the bone injury be declared as ideally healed.

It can therefore be concluded that the principles lay down by Ayurvedic texts are extremely relevant and many of them are practiced by the modern orthopaedic surgeons even in the present times. It would also probably be worthwhile, in the time to come, to explore the role of diet and decoction mentioned in Ayurveda for accelerating the fracture healing.

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