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Review Article

A CRITICAL REVIEW ON BHAGNA

Sunil Kesthur Shivaramaiah [1]*, Siddayya Aradhyamath [2], Savita Hiremath [3]
[1]Assistant Professor, Department of Shalya Tantra, JSS Ayurveda Medical College, Mysore, Karnataka, India
[2]Associate Professor, Department of Shalya Tantra, JSS Ayurveda Medical College, Mysore, Karnataka, India
[3]Assistant Professor, Department of Kaya Chikitsa, JSS Ayurveda Medical College, Mysore, Karnataka, India
*Corresponding Author Email: drsunilks83@gmail.com

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ABSTRACT

Fracture is a common clinical entity encountered in day to day practice. But this condition dates back to several thousand years during the period of Acharya Sushrutha and Charaka, which were managed skillfully. It highlights that knowledge of fractures were known to ancient people. During ancient days they used the term Bhagna for fractures. References are available even in our epics like Rigveda regarding bhagna. The following article presents a brief review on fracture management both in Ayurvedic and contemporary views.

Keywords: Bhagna, Bhagna stapana, Fracture, Karma avarthana, Kusha bandhana, Reduction

INTRODUCTION

Many ancient reference are available in context of bhagna including our vedic text like rigveda. In perceptive of Ayurvedic literature various reference are available regarding bhagna about their etiological factors and treatment. In this present era we have many diagnostic tools which help in diagnosis, prognosis and treatment of fracture but during the time of our acharyas there were no diagnostic aids such as radiography, scanning etc. still our acharyas were able to diagnose it properly and manage it successfully.

These references suggest that bhagnas were managed proficiently during ancient days. The classification and treatment holds good same even today for present era with many diagnostic tools and advanced treatment methodologies.

REVIEW OF LITERATURES

Shabdhotpatti

The word bhagna is derived from the root 'bhanj dhatu and 'kta' pratyaya meaning to break. Bhanj means 'motana' which once again means to break[1,2].

Vyakhya

Bhanjayateeti bhagnam[3]

Paryaya

Bhagna, bheda, bhedana, bhanjana, vibhanga

Etymology of fracture

The word fracture is derived from the latin term Fract which means discontinuity in a substance. From this word other terms like fracture, fragile, fraction, refraction etc. originated. Literally fracture means to break or discontinue. In medical science fracture means break or discontinuity of bone or cartilage[4,5].

Definition

A fracture may be a complete break in the continuity of a bone or it may be an incomplete break or crack[6]. Hence, fracture may also occur through cartilage, epiphysis and epiphyseal plate.

Etiology of bhagna[7]

Bhagna in general is always Abhighataja sushrutha's attempt to specify the nidanas as follows

Patana: fall from a height, fall into pits, fall on the ground with outstretched hands etc.

Peedana: violent pressure or compression affects directly or indirectly over the bones

Prahara: strong blow from blunt instruments such as lati or musti prahara

Akshepana: violent jerks, vigorous movements or sudden and severe contraction of muscles

Vyala mrugadashana: bites, nail injuries or attack of wild beasts which was very common in ancient days

Balavad vigraha: strong block from heavy or strongly built personality

Abhigata vishesha: trauma caused by different reasons results n varieties of fracture including different bones.

Some of the conditions like asthi kshaya, majja kshaya, asthi vidradhi, majjavidradi, pakshagata, phiranga, asthi majjagata kusta, asthi majjagata vata etc. are grouped under aetiology for pathological fractures. Addition to this bhagnas of durjata asthi (congenitally deformed bones) is also considered as pathological aetiology.

Effect of trauma on bones

The bones sustain trauma in different ways. Acharya sushrutha has paid due attention to this fact and observed that all the bones do not show similar type of response to the trauma. He has classified these effects in different groups and co-related with the types involved as mentioned below.

Cartilage bone	Tarunasthi	Bends
Long bones	Nalakasthi	Breaks
Flat bones	Kapalasthi	Cracks
Teeth, irregular & small bones	Ruchakasthi	Fragmented

Clinical features

Presence of fracture can be made out by history and clinical findings. The clinical signs and symptoms described in Ayurveda text stands the same as mentioned in any contemporary surgical text book. Sushrutha's contribution in this aspect is so perfect that it has hardly any room for alteration even today. Sushrutha has mentioned signs and symptoms both in general and specific.

General signs and symptoms[7]

Shwayatu bahulya (diffuse swelling at the sight of fracture):- generally fracture whether it is hairline or comminuted, it will be associated with moderate to severe swelling.
Spandana :- throbbing sensation or twitching or pulsatile feeling at the fractured site
Vivartana:- displacement of fractured fragment
Sparsha asahishnutha (Tendreness) : tenderness is such a sign that it is invariably present in all types of fractures.
Avapeedyamane shabdha (crepitus elicited on palpation):- presence of crepitus is a definite sign of fracture, which confirms the diagnosis
Srastangata:- flacidity of muscles
Vividha vedhana pradhurbhava (different types of pain) :- the fractured bone before its reduction and immobilization produces variety of pain. This depends on nature of trauma, bone fractured, displacement of the fragments and nature of soft tissue injury.
Sarva avastasu na sharma labha (Inability to get comfort in any position):- fractures results in pain and discomfort to the patient till immobilizing. The discomfort is such that patients remains restless in any posture.

Specific features of individual kanda bhagna

1. **Karkataka** :- fractures resembles the shape similar to a 'crab' and so named as karkataka. There will be no displacement of fractured fragments. Fractured fragments may be elevated. On palpation it resembles a gland.
2. **Ashwakarna**:- the fractured part has appearance of horse ear and is elevated and displaced. The chances of re-displacement are more after reduction due to muscle spasm.
3. **Churnita** :- In this type of fracture, the bone breaks into multiple fragments and not able to regain normal shape. There will be greater injury to soft structures. This bhagna can be easily detected by palpation due to the presence of crepitus throughout the line of fracture.
4. **Picchita** :- In this type of fracture , the fractured part gets separated from the body itself.
5. **Asthichallita** :- Here the fracture is confined to any one surface of bone that is medial, lateral, anterior or posterior side. Fractured fragments are taken away from site of injury due to muscle contraction.
6. **Kandabhagna** :- The term kanda bhagna is specially used for fractures of the shaft of bones. An attempted movement produces tremors. There will be displacement of the fractured fragments. Re-displacement is common.
7. **Majjanugata** :- The fragments of the broken bone are impacted into the marrow cavity of the other fragment and this is resulted due to force of violence. This variety of fracture is commonly seen in humerus and femur. It is a fracture of old age. This type of fracture is difficult to daignose clinically because the signs and symptoms like rotational deformity, crepitus etc. are absent due to impaction.
8. **Atipatita** :- It is a complete fracture, in which the fragments are completely separated and the separated fragments hangs or angulates.
9. **Vakram** :- It is an incomplete variety of fracture. This type of fracture is seen only in children. There will be visible deformity.
10. **Chinnam** :- A fracture in which one of the cortex of the bone remains patent. This is also an incomplete variety of fracture There is no visible deformity in this fracture.
11. **Patitam** :- A fracture in which, bone is partially fractured and cracked into multiple fissures resulting in severe pain in the affected part. Madhavakara calls it as bahu vidiranas[7].
12. **Sputita**:- In which the fractured part is swollen, looks like tip of paddy bunch. There will be pricking pain due to sharp points of bristles. Hence, the bhagna is of crack type mostly occurs in small bones, teeth etc.

Principles of Bhagna chikitsa[8]

The line of treatment in Bhagna comprises of three important steps
(1) Bhagna Sthapana (Reduction)
(2) Kusha Bandhana (Retention)
(3) Karmavarthana (Rehabilitation)

Bhagna sthapana is not required in all the Bhagna. In case of incomplete fractures or when the fracture is of stable variety, reduction is not required. On the other hand it is very essential in fractures where the fracture fragment is unstable, like supracondylar fracture of Humerus, Femur etc. Aim of Bhagnasthapana is to approximate the fractured ends and to achieve proper alignment.

There are two main techniques mentioned in Sushrutha Samhita for closed manipulation namely Anchana and Peedana.

Anchana (Traction): It is a technique in which the wide gap between the fragments may be corrected. Anteriorly, medially, laterally or posteriorly displaced fragments can be brought in alignment by the application of traction.
Peedana (Pressure): It is another technique where in fractured fragments are approximated through gentle and controlled pressure. The Vinamana and Unnamana techniques can be incorporated within Peedana only. In case Vinamana (depressed) fractures; the fragment should be carefully lifted up. In case of Unnamana (elevated) the raised fragment should be gently pressed down.

II. Kushabandhana (Immobilization): To prevent the movements that interferes with union, to prevent re-displacement of fractured fragments, to prevent angulations and to relieve pain and soft tissue injury kushabandhana is done.

III. Karmavarthana (Rehabilitation)

The importance of Physiotherapy in a limb injury was also appreciated by Sushruta. After proper union it is desirable that the joints or the fractured parts must regain normal functions and shape. For this Sushruta has given importance to rehabilitation. Various devices including exercises were being suggested by the acharyas. In the fracture of the carpal, metacarpal and phalangeal joints, initially the use of clay ball and at a later period the use of salt and the pieces of stone have been suggested.

This also suggests that an injured part should not be put into action immediately, but gradually the movements may be restored. After immobilization gentle massage with specific oils gradually restores the movements in the affected part and enhances circulation.

Principles of Fracture treatment[9]
Local management of fracture

The primary aims of fracture treatment are
1) To attain sound bony union without deformity.
2) To restore the functions of the fractured limb. This must be done as quickly as possible.

To achieve this, 3 steps are followed.
1) **Reduction** – it is to bring the fractured fragments in alignment without any displacement.
2) **Retention** – here the fractured fragments are kept immobilized, in the reduced position till union occurs.
3**) Rehabilitation** – it is restoration of function. These are classically described as the "Three R"

DISCUSSION

Reason for fracture is that even though bones are rigid, but they do bend when an outside force is applied to it. When this force stops bone return to its original shape. For example, if one falls forward with outstretched hand, there is an impact on the bones and connective tissue of wrist as it hits the ground. The bones of the hand, wrist and arm can usually absorb this shock by giving slight pressure and then returning to their original shape and position. If the force is too great, however bones will break just as a wooden ruler breaks after being bent too far. The immediate effect of a simple fracture of a human bone are to break the bone cortex and trabeculae, lift up or tear the periostium and severe the periosteal, endosteal and haversian blood vessels, resulting in extra vasation and pooling of blood.

The principles laid down in Ayurveda with regard to 'Bhagna Chikitsa' are universal and is still in practice. Irrespective of the system of medicine, the general management of any fracture is, an elevated fractured part should be reduced by pressing it down, while hanging down should be reduced by raising it up, by pulling it in the case of its being pushed aside, and by reinstating in its upward (proper) position in the event of its being lowered down.

CONCLUSION

However, there are certain principles behind every line of management, if correctly laid down, would universally remain unchanged whatever be the means that may be adopted to achieve them. The efficiency of Sushrutha's skill regarding the management of a fracture case is not challenged even today. The present day medical science has also accepted most of the principles of Bhagna chikitsa described in Ayurvedic classics. Objectives described in classics include approximation of the fractured fragments, realignment of fractured ends without any angulations as far as possible so that the full length of the limb or the injured part is obtained, facilitate the injured bone to heal or unite. Rehabilitation technique is been described in step wise to attain sound function of fractured part and to improve the strength and the stability. Therefore, to expect that whatever means Sushrutha adopted in the treatment of a case of skeletal injury nearly 3,000 years ago would be as effective even today is certainly not justifiable.

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