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Bhagna: A Classical Ayurvedic Review of Fracture Management

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Abstract:

BHAGNA is a common entity in clinical practices. *Bhagna* is synonymous with fracture in modern science, which compromises the integrity of bones and joints, resulting in local pain, swelling, immobility, joint disability, and malformation if not properly treated. In *Sushruta Samhita Nidan Sthan 15* and *Chikitsa Sthan 3*, elaborated knowledge is given about the types of *BHAGNA*, their clinical presentations, and traditional approaches within the *Shalya Tantra*. The *Ayurveda BHAGNA* is mainly divided into two: *SANDHIMUKTA* and *KAND BHAGNA*^[1]. *SANDHIMUKTA* is compared with subluxation, and *KAND BHAGNA* is related to fracture with respect to generalized and local signs and symptoms. *Sushruta* defined a very deep view on *samanya lakshan* and *vishesh lakshan*. In the treatment strategy for *Bhagna*, *Chikitsa* is very comprehensive and involves splinting (*Kushabandhan*), structural realignment (*Bhagna Sthapana*), immobilization (*Sthirakarana*), *Kapatshayan*, internal healing (*Sandhana*), and rejuvenation (*Rasayana*), as well as *Aapothya*

for malunion. This review gives an overview of the fundamental principles, techniques, and clinical applications related to *Bhagna Chikitsa* in *Ayurveda*.

Keywords:

Bhagna, *Sandhimukta*, *Kandbhagna*, *Kushabandhan*, *Kapatshayan*, *Sandhana*, *Aapothya*, *Bhagna Chikitsa*.

Introduction:

Asthivishlesha (breaking in bone or joint) means *Bhagna*, as stated by *Aacharya Madhava* in the *Madhukosh Tika*. When *Sushruta* explained the causes of *Bhagna*, they provided the causes for fracture and subluxation: *Patan* (falling down), *pidan* (compression), *prahar* (direct blow), *aakshepan* (pulling), and *vyal mrug dashan* (biting or scratching of animals). *Bhagna* types, *Samanya lakshan*, and *Vishesh lakshan* of *Kanda bhagna* and *Sandhimukta bhagna* are detailed in the *Nidan Sthana*. In the *Chikitsa Sthan*, *Aacharya Sushruta* explained the specific *bhagna chikitsa* and internal medications for healing with external stabilization of the fracture site.

Diagnostic tools include:

- Classical diagnosis by *darshan*, *sparshan*, and *prashn pariksha*.
- Modern science functional tests to identify bone and joint integrity, palpation for tenderness, crepitations or dislocation, and integrity with X-ray, CT scan, and MRI.

In the etiology of fracture, *Acharya Sushruta* explained the *hetu* for *kand bhagna* and *sandhimukta*:

<i>Kand Bhagna</i>	<i>Sandhimukta</i>
1. <i>Patan</i>	4. <i>Aakshepan</i>
2. <i>Pidan</i>	5. <i>Vyal mrug</i>
3. <i>Prahar</i>	6. <i>Dashan</i>

Balvatvinigrahadinamvarodh by *Dalhan Nibandsangrah*.

Aim

- To review the classical *Ayurvedic* theories and principles.
- To discuss the role of external and internal therapies for management.

Objectives:

- To review the classification of *bhagna* and its *Ayurvedic* treatment modalities.
- To discuss the modern correlation of types of *bhagna* and their features.

Methodology:

This is a review article based on classical *Ayurvedic* texts, published journals, and case studies with relevant case reports. Classical literature, including the *Sushruta Samhita*, *Madhav Nidan*, *Ashtang Hriday*, and *Charak Samhita* with their commentaries, are reviewed.

Discussion:

Classification of Fracture - *PRAKAR*: *Sandhimukta* (6) and *Kandbhagna* (12).

Sandhimukta:

1. उत्पिष्टं
2. विशिष्टं
3. विवर्तितम्
4. अवक्षिप्तम्
5. अतिक्षिप्तं
6. तिर्यक्क्षिप्तम्

Kandbhagna:

1. कर्कटक
2. अश्वकर्ण
3. चूर्णित
4. पिच्चितं
5. अस्थिच्छलितं
6. काण्डभग्न
7. मज्जानुगतम्
8. अतिपातितं
9. वक्रम्
10. छिन्नं
11. पाटित
12. स्फुटित

Samanya Lakshan of *Sandhivishlesha*: 'तत्र प्रसारणाकुञ्चनविवर्तनाक्षेपणाशक्तिरुग्ररुजत्वं स्पर्शासहत्वं चेति सामान्यं सन्धिमुक्तलक्षणमुक्तम्'. Inability in movements like flexion and extension of joints, pain, and tenderness at the site.

Samanya Lakshan of *Kandbhagna*: श्वयथुबाहुल्यं स्पन्दनविवर्तनस्पर्शासहिष्णुत्वमवपीड्यमाने शब्दः स्रस्ताङ्गता विविधवेदनाप्रादुर्भावः सर्वास्ववस्थासु न शर्मलाभ इति समासेन काण्डभग्नलक्षणमुक्तम्. Inflammation, crepitus on palpation, discomfort in any position, and pain are common symptoms seen in fracture.

Table no. 1: Sandhimukta types and lakshan

Type	Lakshan
उत्पिष्टं	सन्धावुभयतः शोफो वेदनाप्रादुर्भावो विशेषतश्च नानाप्रकारा वेदना रात्रौ प्रादुर्भवन्ति
विशिष्टं	विशिष्टेऽल्पः शोफो वेदनासातत्यं सन्धिविक्रिया
विवर्तितम्	सन्धिपार्श्वपिपगमनाद्विषमाङ्गता वेदना
अवक्षिप्तम्	सन्धिविश्लेषस्तीव्ररुजत्वं
अतिक्षिप्तं	द्वयोः सन्ध्यस्थोरतिक्रान्तता वेदना
तिर्यक्क्षिप्तं	त्वेकास्थिपार्श्वपिपगमनमत्यर्थं वेदना

Table no. 2: Sandhimukta and its modern correlation^[2]

Sandhimukta	Correlation
उत्पिष्टं	Fracture dislocations
विशिष्टं	Dislocation due to tear of ligaments
विवर्तितम्	Antero-posterior dislocation
अवक्षिप्तम्	Downward displacement
अतिक्षिप्तं	Gross displacement
तिर्यक्क्षिप्तं	Oblique displacement

Table no. 3: Kand bhagna and lakshan

Type	Lakshan
कर्कटक	सम्मूढमुभयतोऽस्थि मध्ये भ(ल)गं ग्रन्थिरिवोन्नतं
अश्वकर्ण	अश्वकर्णवदुद्गतमश्वकर्णकं, स्पृश्यमानं
चूर्णित	शब्दवच्चूर्णितमवगच्छेत्
पिच्चितं	पृथुतां गतमनल्पशोफं
अस्थिच्छलितं	पार्श्वयोरस्थि हीनोद्गतम्

काण्डभग्न	वेल्लते प्रकम्पमानं
मज्जानुगतम्	अस्थ्यवयवोऽस्थिमध्यमनुप्रविश्य
अतिपातितं	अस्थि निःशेषतश्छिन्न
वक्रम्	आभुनमविमुक्तास्थि
छिन्नं	अन्यतरपार्श्वविशिष्टं
पाटित	मणुबहुविदारितं वेदनावच्च,
स्फुटित	शूकपूर्णमिवाध्मातं विपुलं विस्फुटितं

Table no. 4: Bhagna and modern correlation

Kandbhagna	Modern Correlation
कर्कटक	Depressed fractures
अश्वकर्ण	Complete oblique fractures
चूर्णित	Comminuted fractures
पिच्चितं	Compressed fractures
अस्थिच्छलितं	Periosteal avulsion fractures
काण्डभग्न	Complete compound fractures
मज्जानुगतम्	Fracture impaction
अतिपातितं	Complete compound fractures
वक्रम्	Greenstick fracture
छिन्नं	Incomplete fractures
पाटित	Comminuted fractures
स्फुटित	Fissured fractures

This classification is quite similar to contemporary systems like Salter-Harris or AO fracture classification.

कृच्छ्रसाध्यभग्नलक्षण (Difficult to treat/Untreatable symptoms):^[3]

- चूर्णित (*Churnit*)
- छिन्न (*Chinna*)
- अतिपातित (*Atipatit*)
- मज्जानुगत (*Majjanugat*)
- कृशवृद्धबालानां क्षतक्षीणकुष्ठिश्वासिनां सन्ध्युपगतं चेति. *Churnit*, *chinna*, *atipatit*, and *majjanugat bhagna* are untreatable if the patient is *krusha* (emaciated), *vrudha* (old), *kshatkshin* (TB), or has leprosy or *shwas* (asthma).

By *Ashtang Sangrahar Vagbhat*:

1. *Vellit* – bone breaks in two and it hangs.
2. *Darit* – bone breaks in multiple fragments.
3. *Sheshit* – incomplete fracture where the fracture line does not cross the complete bone.

Chikitsa Sutra – Asht Bhagna Chikitsa Ang:

1. *Sthapana*
2. *Pida Hara*
3. *Shothahara*
4. *Sandhana*
5. *Sthirakarana*

6. *Dhaatu poshana*
7. *Agni deepan* and *Aama pachana*
8. *Rasayan prayog*

Sthapana – the bone must be stabilized by *aanchan*, *pidan*, *sankshep*, and *bandhana*.

These components are crucial for the management of inflammation, aiding in collagen production, fostering osteoblast activity, and enhancing mineral deposition within the bone tissue. Recent pharmacological research on significant *Ayurvedic* preparations, including *Laksha Guggul*, *Ashwagandha Guggula*, and *shallaky* (*Boswellia serrata*), shows improvement in bone mineral density^[4]. For joint stability, *Bandhana* should be applied.

Bandhana:^[5]

- *Samay* (Timing): *Saumya Rutu* - every 7 days; *Sadharan Rutu* - every 5 days; *Ushana Rutu* - every after 3 days.
- *Bandhan Swaroop*: *Bandhana* is applied to give stability to the joint and bone; if the *bandhana* is too loose, it will not support the joint, or if the *bandhana* is too tight, there will be *shoth*, *pida*, and *pak*. Therefore, in *Bhagna*, *bandhana* should be a *sadharan bandhana*.

Pidahara and Shothahara:

For inflammation or *shodh*, you can give *parisechan* of *nagrodadi kashaya*; for pain, *panchamula siddh dugdh* or *chakrataila* by *Sushruta*. *Murivenna taila parishechan* also gives relief from pain and inflammation in post-fracture rehabilitation.^[6]

Forces that produce fractures cause injury to both the bone and the surrounding tissues, which results in an inflammatory reaction in the zone of injury. The physiological environment and biological repair have always played a crucial role in the healing of fractures; the periosteal sleeves, blood vessels, and fracture hematoma form important ingredients, and projected mechanical stability is of equal importance.^[7]

Sandhan: Kangu (foxtail millet) has shown *sandhan* properties in bone healing.^[8]

Chikista for specific *bhagna*:

- In *padasthi bhagna*: *Koshabandhan* is indicated, and *bandhana* should be applied; over-exercise should be avoided.
- *Jangha uru asthi bhagna*: After stabilization of the *asthi*, external oil should be applied and massage given; also, *nagrodadi kusha* should be applied on the *jangha pradesh*.
- *Tala bhagna chikitsa*: Both *tala* should be tied to each other, and

aamtaila parishek should be given for improvement of muscle movement. The patient should first hold a *mrita pinda*, then a *lavan pinda*; if the patient recovers completely, they should hold a *pashan pinda*.

In modern practices, the patient is instructed to perform active range of motion exercises. After 4-6 weeks, putty and grip exercises are indicated, and after 8 weeks, progressive strengthening exercises are advised.^[9] If a patient follows proper medication after the *bhagna*, in *balkal*, *sandeep bhavana* will heal in one month; in *yuvavastha*, in 2 months; and in *vridhavastha*, in 3 months.

The 5Rs framework for fracture management:^[10]

1. Resuscitation: Includes patient care, pain management, associated injuries, and shock.
2. Recognition: Of fracture type through clinical assessment and physical examination.
3. Reduction (Bone alignment): By using manual or traction reduction.
4. Retention (Fracture position): Achieved by external immobilization methods like casts, splints, and braces.
5. Rehabilitation: After fracture.

Traditional entities related to *bhagna chikitsa*:^[11]

- **KUSHABANDHAN:** A technique ancient surgeons practiced for fracture immobilization, applying barks of certain plants like bamboo, banyan, or pipal.
- **ASTHIPOORAN:** In compound or multiple fractures where part of the bone is separated or missing, one has to fill the missing part with *SUDHA VARGA dravyas* (materials possessing calcium). A paste prepared from *Sudha varga dravya*, decoction of *Rubia cordifolia*, and latex of the banyan tree was used as graft material. Medicated oils are then applied for proper acceptance and healing.
- **CHAKRAYOGA:** Skeletal traction used in long bone fractures, shaft fractures, or hairline fractures.
- **KAPATSHAYAN VIDHI:** Used in fractures of the thigh, hips, ankle, shoulder, spine, thorax, and axillary area. The patient is laid on a multi-holed bed where the affected part is immobilized using five wooden pegs.

Conclusion:

Bhagna management in *Ayurveda* offers a sophisticated and holistic approach that

aligns closely with modern orthopedics. The detailed classification of *Sandhimukta* and *Kandbhagna* by *Aacharya Sushruta* provides a precise diagnostic framework comparable to contemporary systems. The therapeutic principles—encompassing structural realignment (*Sthapana*), biological healing (*Sandhana*), and specialized immobilization techniques like *Kushabandhan* and *Kapatshayan*—highlight the advanced surgical wisdom of ancient India. Furthermore, the integration of internal medications such as *Laksha Guggul* and dietary interventions like *Kangu* demonstrates a comprehensive strategy for enhancing bone mineral density and accelerating recovery. This classical knowledge, supported by modern rehabilitation frameworks like the 5Rs, remains highly relevant for effective fracture care today.

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