



**Review Article**

**CONCEPT OF POST OPERATIVE PAIN AND ITS MANAGEMENT IN AYURVEDA: A LITERATURE REVIEW**

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**ABSTRACT**

Adequate analgesia in postoperative period is an essential and humanitarian factor for faster recovery. Currently used analgesics are opioids and NSAIDs which have certain adverse effect. So there is need to search pain management measures from alternative science to minimise use of opioids and NSAIDs. *Sushruta samhita* (Sushruta's compendium) is the oldest reference for surgery in the world. He did various surgeries including laparotomy for intestinal obstruction, perforation, rhinoplasty, cataract and so many minor surgeries like cyst, lipoma removal etc thousand years back. Certainly he managed postoperative pain also. An effort is made in this article to explore Sushruta concept of postoperative pain and its management. Also currently available online articles regarding postoperative pain management in Ayurveda are searched. By using Ayurvedic protocols, polyherbal formulations effective pain management is possible and use of NSAIDs and opioids can be minimised.

**KEYWORDS:** Post-operative pain, Ayurveda, Sushruta samhita.

**INTRODUCTION**

Pain is an unpleasant sensory and emotional experience associated with actual or potential tissue damage, or described in terms of such damage<sup>[1]</sup>. Pain is the commonest symptom associated with many ailments and compiles the patient to seek for medical advice. American Pain Society (APS) introduced the phrase "pain as the 5<sup>th</sup> vital sign<sup>[2]</sup>. Any surgery invariably results in pain. Effective postoperative pain control is an essential and humanitarian need of every surgical procedure. Inadequate pain control may result in increased mortality delayed recovery and increased hospital costs<sup>[3]</sup>. Untreated postoperative pain may also be associated with delayed wound healing, which may complicate the postoperative course<sup>[4]</sup>. The therapeutic agents currently available for the treatment of pain usually have limited effectiveness and safety<sup>[5]</sup>. Therefore, research into new effective and safe analgesic agents with satisfactory tolerability and proven efficacy is urgently needed<sup>[6]</sup>. Opioids and NSAIDs are currently used analgesic agent. These are associated with certain adverse effect. Lot of research work has been done in alternative sciences for effective management of pain. There are many treatment modalities available in Ayurveda for management of pain.

Ayurveda is an ancient Indian medical science. It is not merely a medical science but it teaches us a way of living healthy life. Complete knowledge of Ayurved is available in *Bruhatrayi* which comprises of Charak samhita, Sushrut & Vagbhat samhita. These three are main treatise of Ayurveda. Out of these Sushrut samhita written by Acharya Sushrut mainly deals with surgery. Sushrut was great Indian surgeon. He is known as father of surgery and also father of plastic surgery due to his tremendous work in the field of surgery at his time which forms the basic foundation of today's modern surgery. Sushrut samhita consists of six sections (*Sthan*) and 186 chapters, descriptions of 1,120 illnesses, about 300 surgical procedures, over 120 surgical instruments and around 700 drugs of animal, plant and mineral origin<sup>[7,8]</sup>.

Many review articles are available explaining various treatment modalities for the management of pain mentioned in Ayurvedic treatise. These articles particularly deals with different types of arthritis, various musculoskeletal disorders etc. Very few articles are available giving comprehensive management of post operative pain according to Ayurveda. Sushruta at his time did lot of surgeries which includes right from simple excision of cysts, incision and drainage, wound debridement,

amputation, craniotomy, laparotomy, plastic surgery, cystolithotomy, cataract surgery etc. These procedures need some sort of anaesthesia, post operative wound care and adequate analgesia. Sushruta has divided every procedure in three steps. In the present article we have made an effort to explore Sushruta's post-operative management in different procedures with special emphasis on wound care and pain management.

#### AIMS AND OBJECTIVE

1. To explore post operative pain management methods given in Sushrut samhita.
2. To study in details wound management in different procedures in the era of Sushruta.

#### METHOD AND MATERIALS

1. Articles published in journals indexed in biomedical journal database such as Pub Med, Scopus & Web of Science were searched. We searched Pub Med central by using key words as postoperative pain, Ayurveda and polyherbal. No limits in advance search were adapted such as journals, years of publication, types of articles, or authors except articles published in the English language until February 2020 were included for the purpose of review. Articles having relevant titles were reviewed in full (abstract and also full article).
2. Relevant part of Sushrut *samhita* dealing with various operative procedures, postoperative wound care in full was meticulously reviewed. Total 11 articles were shown in PubMed search result using above keywords. Unfortunately none of the article was having relevance to our search. So we searched Google scholar. Total 1200 articles were shown as a search result on Google scholar. Most of the Ayurvedic articles are published in such a journal which are peer reviewed but not indexed properly in biomedical journal database. It's a serious issue. There are only few journals in the field of Ayurveda that understand and encourage Ayurveda concepts and researches<sup>[9]</sup>. Very few journals in the field of Ayurveda are indexed in PubMed, Scopus or Web of Science.

While reviewing Sushrut Samhita meticulously we found following results:

In Sushrut samhita *sutrasthan* in chapter five, detail description about *Trivid karma* i.e., *Poorvkarma* (preoperative), *Pradhan karma* (operative) and *Paschyat karma* (postoperative) is given. Post-operative care which is explained here is for *Sadyovrana* (recently occurred wound due to surgical procedure like incision and drainage, incision taken on any body part to remove foreign body etc.) Sushruta advocated that after taking incision remove

shastra (scalpel) sprinkle cold water on the patient's mouth to make him awake. Press the surgical wound from all around by fingers to remove *Dosha* (here *Dosha* is correlated with pus or any infected material), then wash the wound by different types of decoctions made up of different herbs to clean the wound cavity. The type of decoction to be used depends on the type of humour (i.e., *Vata*, *Pitta* or *Kapha*) involved. Commonly used decoction is made up of *Triphala* powder [a famous Ayurvedic formulation which is a blend of three herbs viz., *Hirda* (*Terminalia chebula*), *Amla* (*Phyllanthus emblica*) and *Behada* (*Terminalia bellirica*)], also a decoction made up of *Panchvalkal* powder is commonly used. Then one should clean the wound with cloth and wound should be packed with *Varti*. *Varti* is a long gauze piece smeared with paste of sesame seeds, honey and ghee. This should be dressed properly. Then Sushruta has advised to do *Dhoopan* treatment. In *Dhoopan* one has to generate fumes by pouring herbs on burning charcoal. The herbs to be used should have *Vedanahar* (analgesic) and *Rakshoghna* (anti-microbial) property. Commonly used herbs for *Dhoopan* are *Guggul*, *Agaru*, *Ral*, *Vacha*, and *Neem* etc.<sup>[10]</sup>

Also in the similar chapter Sushruta has explained that in any type of *Sadyo vrana* recently occurred wound (traumatic wound) one should pour lukewarm *Yashtimadhu ghrít* (A cow ghee fortified by *Glycerrhiza glabra*) to relieve pain of the patient<sup>[11]</sup>.

Next to the *Sutrasthan* 5<sup>th</sup> chapter in Sushrut samhita we get details about *Kshar karma* in 11<sup>th</sup> chapter. *Kshar karma* is one of the most important parasurgical procedures given in Sushrut samhita. *Kshar* is nothing but an alkaline substance prepared from single or multiple herbs which causes chemical cauterisation of the part where it is applied. In postoperative procedure after *Ksharkarma* Sushruta has advised to wash the wound by *Dhanyamla* (*Kanji*-it is prepared by putting water in a cooked rice and allowing it to ferment for 7 days), vinegar or lemon juice (any liquid having sour test). Then here also Sushruta has advised to apply a mixture of herbs having sour test, *Ghee* and *Yashtimadhu*. This will relieve the burning pain that occurs after *Kshar* application.

*Kshar karma* is mainly done over internal haemorrhoids now a day. Pain management after *Kshar karma* can be done by above method<sup>[12]</sup>.

Sushruta in his 12<sup>th</sup> chapter in *Sutrasthan* has given detail description about *Agikarma* (therapeutic cauterization). This procedure is useful in cases in which *Vata* and *Kapha dosha* is involved. It is widely used now a day for musculo skeletal pain, cervical and lumber spondylitis, osteoarthritis, sciatica,

frozen shoulder, planter fasciitis etc. In these disorders *Agnikarma* immediately gives pain relief. It is also used in some surgical disorders like corn, moles, and granuloma. It can be said that energy devices being used now a days in surgery like electrocautery, ligasure, vessel sealer, and radiofrequency are advance form of *Agnikarma* devices that are told in *Sushrut samhita*. After proper *Agnikarma* honey and *Ghee* is advised to be applied over the burn area.<sup>[13]</sup> *Agnikarma* relieves pain and stiffness.

Apart from these *Kshar karma* and *Agni karma* next parasurgical procedure is *Raktamokshan* (bloodletting) described by *Sushruta* in *Sutrasthan* 13<sup>th</sup> chapter. The most widely used method of *Raktamokshan* is *Jalaukavchran* (leech application). It has wide variety of indication. It is very useful in skin diseases like eczema, psoriasis etc. It is useful in any inflammatory condition like cellulitis, inflamed thrombosed haemorrhoids etc. It is useful in painful infected chronic ulcer, venous ulcer. It is also useful in reliving painful symptoms of peripheral arterial diseases. It also helps in healing of wound.

In *Sutrasthan* chapter 16 detail description about *Karnasandhan* (auroplasty), *Nasasandhan* (rhinoplasty) and *Oshtsandhan* (repair of congenital lip anomaly like hair lip) has been given by the *Sushrut*. Inspiring by these method today's modern plastic surgery branch is developed. Concept of pedical graft is the gift of *Sushruta* to the entire world. This is the reason why *Sushruta* is called as father of plastic surgery. Post operative care is also given in this chapter in detail but there is no comment on pain management.

*Sushruta* in *Sutrasthan* chapter 17 has explained about *Vranashopha* (inflammation) in detail. Here in *Pakva Vrana shopha* (suppurative stage of inflammation) *Sushruta* has advised *Patan karma* (incision and drainage). To reduce surgery related pain and also post operative pain he advocated strong wine<sup>[14]</sup>. Apart from this if the patient doesn't drink wine heavy sweet food should be given to the patient due to which patient remains drowsy. It helps him to bear the pain of surgery. Rest post operative management is same as that explained in *Sutrasthan* chapter five. In the same chapter *Sushruta* has explained role of *Vata* humour in development of pain in any *Shopha* (inflammation). This is applicable for development of symptom – pain in other diseases also. *Vata* is responsible for pain in many other diseases.

In *Sutrasthan* chapter 18 details about *Pralep*, *Pradeh* and *Aalep* (applying paste of medicine either hot or cold over the affected inflamed body part) is given. This reduces swelling and pain. This has been

also recommended for *Vranayukt shoph* (inflammation associated with wound).<sup>[15]</sup> Types indications and contraindications of bandaging is also given in this chapter. Apart from fractures management, wound bandaging has role in pain management too.

*Sushrut Sutrasthan* chapter 19 solely deals with does and dont's for wounded person. This we should consider for every post-operative patient. *Sushruta* has given detail description of how a *Vranitagar* (surgery ward) should be. Ward should be well ventilated, strong air or sunlight should not directly affect the patient. Wounded person should be surrounded by his friends and dear ones who should talk to him in such a way that it will give him feeling of wellbeing. Wounded person should not sleep in day time and should not remain awake in late night. Wounded person should take rest and avoid unnecessary walking, wandering here and there as these activities will increase pain and delay wound healing process. Wounded person should also avoid coitus.

*Sushruta* also has given detailed description about what to eat and what not to eat. Wounded person should not eat new grains. The food which is heavy to digest should be avoided. Those who are alcoholic should not take *Asav arishta* (Ayurvedic formulations containing self generated alcohol). This can also delay wound healing. Wounded person should remain in a comfortable position and should avoid taking excess food, *Virudha ahar* (wrong combination of food) *Visham ahar* (wrong diet in wrong season). Wounded person should listen to holy spiritual stories. A treating physician should give blessings by reciting all *Chaturveda*. This will built confidence of patient and he will recover soon.

Wound should be fumigated with fumes obtained by burning *Sarshap*, *Neem* leaves, *Ghrit* and salt. Wounded person should take easily digestible food like old *Sathi* rice (the rice grain which is obtained in field in 60 days), it should be taken with *Ghrita* and *Mansras* (flesh soup) of wild animals like deer. *Moongdal* (green gram), *Brinjal*, *Parval* (pointed gourd), bitter gourd, *Chaulai* are also very beneficial for a wounded person<sup>[16]</sup>.

The whole chapter is very important in accordance with postoperative care of any wounded person.

*Sushrut sutrasthan* chapter 22 deals with different types of discharges from wound. In this chapter *Sushruta* also have described various types of pain related to wound which is experienced by the wounded person. Types of pain depend on the involvement of *Dosha* (*Vata*, *Pitta* & *Kapha*). Five types of pain experienced by wounded person in different types of *Vrana* (ulcer) are as follows:<sup>[17]</sup>

**Vataj vrana vedana:** *Todan* (pricking), *Bhedan* (breaking), *Shitoshna sparsh*, *Patan* (tearing up), *Vidaran* (lacerating), *Sankoch* (drawn in, contraction), *Harsh* (erection of hair), *Stambha* (immovable).

**Pittaj vrana vedana:** *Daha* (burning), *Paka* (suppuration), *Sweda* (sweating), *Krodha* (anger).

**Shleshma vrana vedana:** *Shaitya* (coldness), *Gaurav* (heaviness), *Sthairya* (firmness), *Stambha* (immovable), *Kandu* (itching), *Shwaithya* (paleness), *Supti* (numbness).

**Raktawat vedana:** Same as *Pitta vrana vedana*.

**Sannipataj vedana:** Here combination of symptoms of *Vataj*, *Pittaj* and *Kaphaj vrana vedana* is seen.

*Nidansthan* and *Sharirsthan* don't deal with any procedure or any pain management procedure.

*Chikitsasthan* chapter first deals with types of wound, its symptoms and management. In 60 procedures (*Shashti upkramas*) first eleven procedures deals with management of inflammation. It prevents inflammation from suppurating and results in resolving the inflammation. *Shashti upkrama* explained here for the management of wound is just the elaboration of *Saptopkrama* (seven majors described in 17<sup>th</sup> chapter of *Sutrasthan*) explained for the management of *Vranashopha* i.e., inflammation. Out of these *Shashti upkrama* the majors that are said to alleviate pain in wound are described here. *Lep-pralep* (application of thick or thin pest of herbs), *Parishek* (fomentation by pouring hot decoction), *Vistravan* (bloodletting) helps in reducing pain in wound and reduces inflammation, helps in healing of wound. *Snehpan* (taking medicated ghee or oil) also helps in reducing pain in wounded person. *Dhoopan* (Fumigation with fumes of medicated herbs) also helps in alleviating pain in wound also it decreases discharge from wound.<sup>[18]</sup>

Chapter second deals with the details of types, symptoms and management of *Sadyo vrana* (traumatic wound). Here in this chapter many majors, formulations are given for cleaning the wound and also for healing the wound. Apart from this some majors to alleviate the pain have been also given. Like in clean incised wound internal oileation with ghee or oil, hot fomentation with poultice prepared from *Snigdha krushara* (a cooked mixture of green gram and rice along with butter). Sushruta also had advocated application of paste of *Sigdha vataghna* drugs (a paste of herbs that pacifies *Vaat* humour like *Dashmool*, *Rasna* etc along with oil or butter). Also to reduce burning sensation in compressed wound and in abrasion Sushruta had advocated pouring of decoction which is made up from the drug which is cool in nature like decoction of sandal, milk, sugarcane juice. The milk is fortified

with sugar, *Yashtimadhu*, *Laksha*, *Gokshur* and *Erand* is to be given to the wounded person for alleviation of pain and burning in wound.<sup>[19]</sup>

Chapter three in *Chikitsa sthan* deals with fracture management. Basic principles of fracture management like *Anchhan* (stretching), *Pidan* (pressing from above or from below), *Sankshep* (shorting, bringing close), *Bandhan* (bandaging for immobilisation) have been well explained by Sushruta which still today are followed and are unchanged. By *Anchhan*, *Pidan* and *Sankshep* a physician should bring about reduction in fractured bony segments (closed reduction). Once reduction is done *Bandhan* (bandaging with application of paste of herbs) should be done for immobilisation of fractured part. Specific treatment for fracture of specific bone is also given. *Kapat- shayan* a special bed which resembles with Thomas splint is described in the management fracture of tibia- fibula. Many formulation, application of pastes have been mentioned which helps in healing of fracture. *Bhagnasandhanak* oil and *Gandha tail* are described specifically for healing of fracture. All these help in healing of fracture and this in turn results in pain relief. We have not found any specific formulation or major specifically for pain management. But with basic principles of fracture management pain goes off<sup>[20]</sup>.

In chapter fourth Sushruta has given many formulations for various *Vaat vyadhi* (diseases specifically caused by *Vaat dosha*), also chapter five deals with management of *Vaat-rakta* (a disease which resembles with gout) has been explained. Apart from this management of *Pakshaghat* (paralysis), *Ardit* (facial palsy), *Vatakantak* (planter fasciitis), *Manyastambh* (neck spondylosis), *Grudhrasi* (sciatica) etc have been also explained. Various formulations, oils for oral and local applications have been explained by Sushruta in these two chapters which alleviates the *Vaat dosha* which is supposed to be the main cause of pain. As in this article we are only searching for post operative pain management and wound management details of these formulation is not given.<sup>[21,22]</sup>

Chapter six deals with the management of *Arsh* (haemorrhoids). Four majors have been explained by Sushruta for the management of *Arsha* i.e., management by medicine, *Kshar karma* (application of paste of alkaline mixture of herbs), *Agnikarma* (cauterization) and surgery (excision). In post-operative major after *Kshar karma* pile mass is to be washed out by *Kanji* (gruel prepared by fermenting cooked rice), curd, lemon juice or any liquid which is sour in taste<sup>[23]</sup>.

In chapter seven, management of urinary calculi is given. Apart from medicinal management, surgical management is also explained. The procedure explained in this chapter for removal of urinary bladder stone was practiced in past. This is perineal route of removal of stone. Due to high rates of complications like post operative bleeding and infection this method is not practiced now a day. In post operative care patient is to be asked to seat in *Droni* (a boat shaped tub) filled with hot water for fomentation. This is to reduce chances of accumulation of blood in bladder. This prevents haematoma in the bladder and post operative retention. If still blood gets accumulated in urinary bladder *Uttar basti* (administration of oil, decoction in urinary bladder by urethral route) with decoction of *Panchvalkal* (a blend of five herbs which are cool in property and having astringent action and test) is to be given. Honey and ghee is to be applied at the wound site. Washing of wound with decoction of *Kshiri vruksha* (*Panchvalkal*) is also advocated by Sushruta. Patient is specially given cooked rice with jaggery and milk to eat. A paste of *Lodhra*, *Yashtimadhu* and *Manjishtha* should be applied at wound site. After doing all these majors for seven days when urine starts coming from urethra Sushruta has advised *Agnikarma* (therapeutic cauterization) treatment at wound site. This might be for cauterising the cysto-cutaneous fistulous tract.<sup>[24]</sup>

Chapter eight deals with management of fistula in ano. Here Sushruta has advocated fistulotomy. In post operative period washing of wound with decoction of different herbs depending on the type of *Dosha* (humour *Vaat*, *Pitta* and *Kapha*) involved is advised. Pouring of *Anutail* for reducing pain is advised. Also hot sitz bath or a *Nadiswed* (fomentation with steam of herbs) for post operative pain management is explained.<sup>[25]</sup>

In *Chikitsa sthan* chapter 14 details of management of *Udar roga* is explained. Eight types of *Udar roga* have been described by Sushruta. Out of these eight *Badhagudodar* (intestinal obstruction) and *Paristravi udar* (intestinal perforation) are the types where exploratory laprotomy is suggested. In these types of cases Sushruta has advocated to open the abdomen by infraumbilical left paramedian incision. The intestine should be examined properly

and obstructing mechanical cause like stone, hair or fecalith should be removed. Intestine should be sutured by *Pippilika dansh* (bite of an ant). A special ant is allowed to bite at two edges of intestine and head is broken from rest of the body. Jaws of an ant remain close. Intestine should be smeared with ghee and honey and deposited back in abdominal cavity. External wound should be sutured. Similarly in *Paristravi Udar* (perforation) *Pippilika bandh* is to be applied rest procedure to be done as explained in *Badhagudodar*. An application of paste of black soil which is mixed with *Yashtimadhu* to be done and a bandage should be applied. Such patient should be asked to seat in a tub of oil or ghee. This might have been advocated for pain and wound management at that time. This patient should be given milk only in diet<sup>[26]</sup>.

Chapter fifteen in *Chikitsa sthan* deals with management of obstructed labor due to different breech presentations. Here various methods have been explained to deliver the baby. If there is no sign of living fetus embryotomy by instruments and evacuation of fetal parts is advised. Such lady should take bath with warm water and should have massage with oil. A cotton swab soaked with oil should be kept into the vagina of such lady. This brings softness to the vagina and reduces the pain. A blend of powders of *Pippali*, *Pippalimul*, *Sunthi*, *Ela*, *Hing*, *Vacha*, *Ativisha* and *Rasna* should be given with butter for pain management. Milk fortified with *Vataghna* medicines (herbs like *Errand*, *Rasna*, *Shatpushpa* etc that pacifies *Vaata*) should be given. *Bala tail*, *Shatpak tail* and *Guduchyadi tail* are described in this chapter for *Sutika* (A lady after delivery in post postpartum period).<sup>[27]</sup>

While searching online research articles we got very few articles related to topic. Most of the articles are on effect of various Ayurvedic formulations, modalities on various painful conditions like arthritis, musculoskeletal pain, sciatica etc. It seems that very little work is done in postoperative pain management by Ayurvedic formulations. Moreover most of the research work which has been done as a part of post graduation thesis is not published yet. The data is tabulated as follows.

Title	Author	Study design	Conclusion
Effect of <i>Acacia catechu</i> and alum hot sit bath on post-operative pain in patients treated with herbal seton	Sreelekshmi V.S., Rajeshwari P.N. et al	Single blind RCT	Acacia & alum hot sitz bath gives better pain control compared to hot water sitz bath in patients treated with herbal seton for fistula in ano

Efficacy of an Analgesic and Anti-inflammatory Ayurvedic Medicine to Control Postoperative Pain	Geetanjali Mandlik, Swapna Nayan et al		Study drug containing <i>Erand (Recinus communis)</i> , <i>Anantmul (Hemidesmos indicus)</i> , <i>Shevga (Moringa pterygosperma)</i> , <i>Guduchi (Tinospora cordifolia)</i> , <i>Rakta punarnava (Boerrhevia Diffusa)</i> effectively reduces pain after tooth extraction.
A comparative study of the analgesic effect of <i>Matra basti</i> with <i>Mahanarayan tail &amp; Bala tail</i> in postoperative pain management of inguinal hernia	Sharmila Tiwari	Comparative study	<i>Mahanarayan tail &amp; Bala tail Matrabasti</i> (enema) are equally effective in postoperative pain management in inguinal hernia surgery
Ayurvedic Approach Towards Post-Operative Pain Management With Special Reference To <i>Charakokta Vedanasthapaka Mahakashaya</i>	Shiralkar A.S, Date P.D et al	A conceptual study	<i>Vedanasthapan Mahakashay</i> of <i>Charak samhita</i> can be used in postoperative pain management
A comparative clinical study of <i>Vednasthapan mahakashaya</i> in Postoperative Pain Management	Neelam Sahu, Vishal varma et al	RCT single blind	<i>Vedanasthapan mahakashaya</i> decoction in a dose of 40ml tds has analgesic property and is comparable with control group treated with diclofenac sodium
A Randomized, Comparative Clinical Study Of <i>Yashtimadhu Ghrita</i> With Lignocaine Jelly 2% Gauze Packing For Post Haemorrhoidectomy Pain Management	Vikas Nigam, Hemant Toshikhane et al	Comparative study	<i>Yashtimadhu Ghrita</i> is having less analgesic property when compared to the lignocaine 2% jelly.
<i>Shallaki</i> In Post Operative Pain Management	Jaiswal R.K, Singh S.K et al	Singal blind RCT	Trial drug <i>Shallaki niryas</i> in a dose of 1gm is equally effective in reducing pain as that of control drug diclofenac sodium 50mg in haemorrhoidectomy patients.

## DISCUSSION

After going through available references in *Sushrut samhita* it is clear that various surgeries were done by the Sushruta at his time. Pain is unavoidable after any surgery and Sushruta took care of postoperative pain by means of resources available at that time. Although definite pattern for grading pain is not noticed in *Sushruta Samhita*, there are ample references suggesting that he has made initiative efforts towards classifying and grading of pain, which was done on the basis of *Dosha* involvement. He had not suggested any special herb or any formulation which specifically reduces postoperative pain. Rather he managed postoperative pain mainly by local measures (*Parishek* i.e., pouring of lukewarm *Ghrita*. Comprehensive management of pain (including postoperative pain as well as other painful pathology in broad sense like musculoskeletal disorder, arthritis etc) as per Sushruta can be tabulated as follows.

### Critical Analysis of the Pain Management Modalities in *Sushrut Samhita*

Local entity	Generalized entity	Acute condition	Chronic pathology
<i>Alepa</i>	<i>Parisheka</i>	<i>Alepa</i>	<i>Swedana</i>
<i>Agnikarma</i>	<i>Sweda</i>	<i>Ushnagrita</i>	<i>Shodana sarpi</i>
<i>Vranadhupana</i>	<i>Snehapana</i>	<i>Agnikarma</i>	<i>Vamanadi shodhan Karmas</i>
<i>Bandhana</i>	<i>Madhyapana</i>	<i>Raktamokshana</i>	<i>Basti</i>
<i>Ushnagrita</i>	<i>Basti</i>	<i>Ushnasarpi</i>	

<i>Sheeta Ushnakriya</i>	<i>Vamanadi Shodhana Karmas</i>	<i>Bandhana</i>	<i>Raktmokshana</i>
<i>Parishek</i>	<i>Siraveda</i>		
<i>Raktmokshana</i>			

Sushrutas approach towards pain management was not only through medicine but also he had holistic approach in the management of pain. He considered psychosomatic component of pain. This is called counseling now days. In Ayurveda we call it as *Satvavjay chikitsa*. That is the reason why Sushruta gave detail description of *Vranitagar* (surgery ward). Every arrangement should be done for ease of a wounded person. Sushruta basically deal with any pain by two lines of treatment one aiming towards reducing intensity of pain and other aiming towards eradication of cause of pain. *Raktamokshan* (bloodletting), *Agnikarma* (therapeutic cauterization), *Lepa-pralep* (applying medicated paste), *Parishek* (pouring medicated oil, decoction), and *Avagah* (hot sitz bath) etc are the local majors used by Sushruta for lowering intensity of the pain. Vitiating of *Vata* is an important cause of pain. Local measures used by Sushruta acts by pacifying *Vata*. Postoperative pain is acute in nature and it demands immediate attention of a clinician. Post operative pain according to Ayurveda is due to surgical trauma that results in *Dhatukshay* (local tissue injury, blood loss). This results in vitiating of *Vata*. Hence treatment is basically aimed in *Vatashaman* (pacifying *Vata*). Pouring of lukewarm *Yashtimadhu Ghrit* pacifies *Vata* and gives relief in pain to the patient. Modalities used by Sushruta for post-operative pain management also have some additional effect. Like after incision and drainage of an abscess *Vranashodan* (cleaning of wound) by decoction of herbs depending on *Dosha* involvement turns the wound to *Shuddha vrana* i.e., clean and tidy wound. *Shuddha vrana* is painless and this helps in *Ropan* (healing of wound). Here both the purposes are solved i.e., pain management and healing. Sushruta has not mentioned any specific herb or any specific formulation for postoperative pain management.

In online search we got some herbs like *Sallaki*, *Erandmul*, *Shigru*, *Guduchi* etc are having analgesic effect. The best herbs should be chosen to make effective formulation having good analgesic properties. Drugs having *Vatahar* properties (properties that pacify *Vata*) can be tried as an analgesic in postoperative pain. In fact many pharmacy institutes have seen analgesic and anti-inflammatory effects of certain herbs in animal experimentations. *Sallaki*, *Nirgundi*, *Shevga*, *Sariva*,

*Guduchi*, *Yashtimadhu*, *Tagar* are some of these herbs.<sup>[28-33]</sup>

As pain is mostly caused by vitiating of *Vata basti* (enema with medicated oil) with oil fortified by herbs having properties opposite to *Vata* can give good results. We saw one article regarding effect of *Bala tail* and *Narayan tail* in post-operative pain management. This study has proven efficacy of *Bala tail* and *Narayana* oil in postoperative pain management. At present no potent analgesic formulation is seen in Ayurveda.

### CONCLUSION

It can be concluded from the study that Sushruta did many surgeries right from minor to major and he managed postoperative pain by using different modalities available at that time. Local majors such as *Parishek* (pouring) of lukewarm *Yashtimadhu ghrit*, *Aalep*, *Bandhan*, *Vrana dhoopan* (fumigation of wound with fumes of herbs) can effectively control postoperative pain. Strong analgesic herbs or formulations are not seen in *Sushrut samhita*, however postoperative pain was being managed by simple local measures. He emphasized more on local treatment for pain management with the help of parasurgical measures and herbs. This can be concluded that pain tolerance of patients at that time was good. Effective anaesthetic medication is missing in *Sushrut samhita*. At that time procedures were being done by just giving liquor to the patient, or by giving heavy sweet food to patient this might have caused mild sedative effect. It's a need of an hour that extensive research should be done in finding comprehensive measures for the management of postoperative pain so that use of modern NSAIDs and opioids will be minimized as it causes potential adverse effects. Effective comprehensive management of postoperative pain in Ayurveda is possible if proper research is done with Ayurvedic herbs having analgesic property.

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