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RESEARCH ARTICLE

POST OPERATIVE MEASURES DESCRIBED IN SUSHRUTA SAMHITA: AN OVERVIEW.

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Abstract

Acharya Sushruta, our ancient Indian surgeon, describes in *Sushruta samhita* over 300 various surgical procedures viz. cosmetic, ophthalmic, dental, orthopedic and abdominal operations. *Acharya Sushruta* has divided the procedures in to three parts: *poorva-karma*, *pradhan karma* and *paschat karma*. *Poorva-karma* are preparation which are required prior to conduct of main activity, *pradhan karma* are those which are actually to be done, and *paschat karma* are those required to prevent any danger of the main action and ensures success. The purpose of the study was to evaluate and elaborate the post operative measures described in *Sushruta Samhita*. The need of post operative measures is for restoration of patient's physical as well as mental strength, complexion and digestive power, maintaining the equilibrium of *doshas*, and management of post operative complications.

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Introduction:-

In *Sushruta Samhita*, the peri-operative procedures are classified as *poorva-karma* (pre-operative), *pradhan karma* (operative) and *paschat karma* (post-operative). Pre-operative procedures include: *langhan to virechanakarma*, operative or main procedures contain: eight surgical procedures, *sandhan, peedan, sonit-sthapana*, etc, and post operative includes *aahar, vihar*, care of the wound and *rakhsa vidhan*. The ulcer gets eroded by aggravation of *doshas*, exercise, injury, indigestion and too much of emotions i.e. joy or anger¹. For the avoidance of post operative complications these factors should be avoided by the patient. It is controlled by proper conduct of *paschatkarma* as described by *Acharya Sushruta*.

Aim and objectives:-

1. To discuss post operative measures elaborated in *Sushruta samhita*.
2. To discuss the need and importance of *pashat karma*.
3. To rationalize the vision of *Acharya Sushruta* and the principles of health behind these regimens in the present time.

Material and methods:-

All the references and study material were collected from the ancient ayurvedic literatures, authentic research journals and various websites related to the topic. After compilation, different views upon the topic were critically evaluated.

Post operative measures:-

These can be divided into the following sections:

1. Auspicious room for the patient
2. *Raksha karma*/ Protective rites
3. *Dhoopan dravya prayog*
4. Wound care
5. *Chikitsa* is divided into
6. *Yukti-vyapashraya*: *Aushadha*, *Aahar* and *Vihar*
7. *Dev- vyapashraya*
8. *Satavajaya*

Auspicious room for the patient²:-

1. After completing the procedure, a little quantity of water is sprinkled on the patient and to destroy the witch and for removing the fear of demons. After performing the protective ritual, the patient should be taken into a special room and advised to adhere to the regimen of diet and other activities.
2. The room for the patient should be auspicious and in accordance to the *vastu shatra*, free from dirt, direct sunlight and heavy breeze. The room should be made convenient to sleep, beautiful, neat and clean, eye-catching and should be furnished with protective armors, so that patient's protection can be ensured³.
3. The wounded person should sleep on a wide bed, so that easy movements of the body parts can be appreciated and his head should be placed to the east direction.

Raksha karma:-

Chatra, *atichatra*, *langali* (*Gloriosa superba*), *jatila* (*Acorus calamus*), *ativisha* (*Aconitum ferox*), *satveerya*, *sahastraveerya*, *siddharthka*, *laxmi*, *guha*, *atiguha* and *brahmcharini* should be worn on the head. The wound should be fanned with fan made of hairs of animals⁴.

Dhoopan dravya prayog:-

1. Fumigation of the patient's room should be done for ten days, twice a day, using *sarsapa*, *nimb* leaves added with ghee and salt.⁵
2. Fumigation of the ulcer should be done by exposing the wound to the smoke coming out from the box of two earthen saucers⁶.
3. Wound with *vataja* predominance, excessive exudation and with intense pain the following drugs should be used: ghee, *yava* (*Hordeum vulgare*), *bhojpatra* (*betula utilis*), *madan* (*Randia spinosa*), *srivestaka* and *devdaru* (*Cedrus deodara*).⁷
4. Fumigation of the patient's room, cot, clothes etc., being used by the patient should also be done with the powder of *guggulu* (*Commiphora mukul*), *agaru* (*Aquilaria agallocha*), *sarjarasa*, and *gaur sarshapa* (*Brassica compestris*) added with *saindhava lawan*, *nimb patra* (*Azadirachata indica*) and ghee⁸.

Wound care⁹

1. The bandage should be removed on the third day, tied again with bandage of clothes. The dressing should not be removed in haste on the second day itself. The wound should not be made to heal in a hurry when the vitiated doshas are still inside.
2. In *hemant* (dewy), *shishir* (winter) and *vasant* (spring) seasons, bandaging of the wound should be removed after three day, while in *sharat* (autumn), *grism* (summer) and *varsa* (rainy) seasons after two days.

Chikitsa:-**Yukti-vyapashraya:-****Aushadha:-**

Determination of the drug, its potency, dose etc, should be appropriate to the dosha, the strength of the disease and the diseased person. Persons who are very emaciated, who have their body parts not having well knit muscles, blood and bones; of poor digestive ability, take very little food, whose body is impoverished of essences of the tissues will be incapable of withstanding the disease itself, such weak patients should be treated with drugs which do not cause discomfort, which are mild, pleasant, and successively hard and which do not cause disability¹⁰.

Aahaar¹¹:-**Pathya:-**

1. Use of little quantity of old *shali* rice which is made unctuous, warm and liquid along with *jangal mansa* rasa should be given to the patient.
2. *Chaulai* (Amaranthus), *jivanti* (Leptadenia reticulata), *chaupatiya*, *bathua* (Chenopodium album), *balmulaka* (Raphanus sativus), *vartaka* (Solanum melongena), *patola* (Trichosanthes dioica) and *karvellaka* (Momordia charatia) fried in ghee and added with *saindhava* (Himalayan rock salt), *anardana* (Punica granatum) powder and *amalaki* (Embllica officinalis) powder should be consumed by the patient.
3. Any others similar in the quality or *moong* (Vigno randiata) soup along with rice can be consumed. The above mentioned ingredients can be also used in *saktu*, *vilepi*, *kulmasha*.
4. For drinking purpose boiled water should be consumed.

Apathya:-

1. The patient should not take freshly harvested grains, black gram, sesame, round pea, horse gram, cow pea, green leafy vegetables, sour and pungent things, jaggery, eatables made from flour, dry meat, dry vegetables, meat and muscle fat of goat, sheep and animals living in marshy places and in water, cold water, milk pudding, curd, milk, buttermilk etc.
2. The patient should not have excessive food consumption, indigestion, use of disliked food, consuming incompatible food, consuming food which is mixture of healthy and unhealthy food.
3. He should also avoid *mairaiya*, *asava*, *arista*, *sidhu* and other *sura* products.

Vihar¹²:-

1. The wounded person should not sleep during day.
2. The patient should protect the wound during his daily activities such as raising, sitting, turning, walking, speaking loudly etc. He should not indulge in standing, sitting, walking for long period and sleeping during day time.
3. The patient should keep him away from too much indulgence in air, sunlight, dust, smoke, dew, jealousy, anger, fear, grief, awakening at night, irregularity in sleep, fasting, speaking loudly, physical exercise, exposure to cold air, flies, mosquitoes etc.

Satavajaya chikitsa¹³

1. In house the wounded person resides should be served by affectionate friends and relatives who talk pleasingly.
2. He should avoid, even at distance, seeing, talking, and touching the woman. By these activities, the semen gets dislodged and flows out.
3. The patient should be clean and wear white dress and always remain devoid of undesirable nails and hairs.
4. The patient reside in a house decorated with lights, water, weapons, garland, flowers etc. and spend his time, listening to stories which are benevolent, auspicious and pleasing to the mind.

Dev-vyapashraya Chikitsa:-

1. The patient should resort to observance of propitiatory and auspicious rites, devoted to god, brahmanas and teachers. Because the powerful demons who seek pleasure in harming others, followers of *Pashupati*, *Kuber* and *Kumara* who are fond of blood and flesh, wander near the patient either in search of blood, for receiving worship of for killing the patient¹⁴.
2. Demons, who desire worship, should be worshiped with great devotion frequently offering fragrant smoke, ritual worship with prayers, flowers etc¹⁴.
3. Both the priest and the physician should perform protective rites daily during early morning and early evening as stipulated in *Rig*, *Yajur*, *Sama* and *Atharva* Vedas and other benedictory hymns¹⁵.

Discussion:-

To provide proper comfort to the patient, a separate room is there, which is devoid of heavy breeze etc. Heavy breeze produces dryness, discoloration and stiffness in the body; it relieves burning sensation and decreases digestive power, sweating, fainting and thirst. Human being should indulge in places free from heavy breeze for increasing their life span and health¹⁶.

1. Patient is instructed to go to the bed at proper time and avoid the night wakefulness. Sleeping at proper time nourishes the body, complexion, strength, enthusiasm, digestive power, wakefulness and maintains the equilibrium¹⁷.
2. Patient's cot must be broad and comfortable. Since comfortable bed relieve fatigue, vata aggravation; are aphrodisiac, bestow contentment, good sleep and courage¹⁸. Sleeping during day by the patient is also restricted. Since it will increase the *kapha dosha*, so itching in the wound, feeling of heaviness of the body, swelling, pain, redness and exudation will increase to a great extent.
3. The wounded person should sleep on a wide bed, so that easy movements of the body parts can be appreciated and his head should be placed to the east. Since god resides in the east, the head of the person should be kept in east direction as a sign of worship.
4. The house is decorated with proper lights, weapons, garland, flowers, etc. Use of perfumes, garlands, flowers etc act as aphrodisiacs, dispels inauspiciousness and improves one's appearance¹⁹. Ancient Egyptians used fragrances in smoke during religious ceremonies. They believed that incorporating these scents within the smoke would allow them to effectively communicate with the gods. Aromatherapy is often used to induce relaxation and eliminate stress from everyday life, however it is also used frequently to treat and manage certain types of medical conditions²⁰.
5. *Chatra*, *atichatra*, *langali*, *vacha*, *ativisha*, *satveerya*, *sahastra veerya*, *siddharthka*, *guha*, *atiguha* and *brahmcharini* should be worn on the head. By wearing these *rakhsoghana dravyas* from the beginning, the *nishachara* (microorganisms) get away from the patient just like other animals run away from the forest invaded by the lion²¹.
6. *Dhoopan dravyas* were used to protect the patient from microorganisms, to remove the wound odour, disinfect the wound, and purify patient's room and the belongings used by the patient. By exposing the ulcer to smoke, there will be relief of pain, cleanliness, and mitigation of exudation²².
7. Free radicals or reactive oxygen species (ROS) are formed in our body as result of biological oxidation and are potential agents to initiate oxidative stress related diseases like cancer. Antioxidants are well known agents for neutralizing these ROS. Antioxidants from plant source are more bio available and are safe for human consumption. Plant derived smokes can play an important role as it can be inhaled actively or passively as ambient smoke²³.
8. The wound dressing is changed on the third day. If it is removed earlier on the second day the wound develops hardness, heals very late and produces severe pain. Afterwards considering the doshas, season, strength of the patient, the wound should be treated with decoctions, medicated pastes, bandaging compatible food and other suitable activities²⁴. The main purpose of wound dressing is to provide ideal environment for wound healing. Covering a wound with a dressing material mimics the barrier role of epithelium and prevents further damage. Occlusion of a wound with dressing material can control the level of hydration and oxygen tension within the wound thus limiting tissue desiccation²⁵.
9. In *hemant*, *shishir* and *vasant* seasons, bandaging is removed after three day, because in cold season there are less chances of wound suppuration, while in *sharat*, *grism* and *varsa* seasons after two days. Moreover, wound dressing is also changed according to the predominant *doshas*. In *pitta* predominant wound dressing is changed earlier than the *vata* or *kapha* predominant wounds. Frequent change of dressing should be avoided as it damages the granulation tissue and delicate epithelium of the wound. Phytoplanktonic exudates release occurs mainly in summer, thus stimulating bacterial growth but being generally lower in winter when phytoplanktonic biomass may be high but production rates are low²⁶.
10. The wound should be fanned with fan made of hairs of animals, so that the wound and patient can be protected from unwanted disease causing flies, mosquitoes, microorganisms or other pathogens. When flies alighting on the wound deposit worms in the wound, bad smell greatly increased, accompanied with severe pain of different kinds and bleeding then, use of *sursadigana* drugs, bark of *saptaparna* (*Alstonia scholaris*), *karanja* (*Caesalpinia crista*), *arka* (*Calotropis procera*), *nimba* (*Azadirachta indica*) and *rajadana* (*Mamilkara hexandra*) macerated in cow's urine or solution of alkali is beneficial for washing the wound. Layers of muscles may be spread on the wound in order to remove the worms²⁷.
11. Once infection occurs in a wound, healing is always delayed. It may be considered as the most important factor that delays healing. Due to infection, Fibroblasts face tough time to persist as they have to compete with inflammatory cells and bacteria for oxygen and nutrients. So proper granulation tissue formation and collagen formation become affected²⁸.
12. *Shali* rice, *jangala mansa rasa*, *moong*, warm water, *vilepi*, *Chaulai*, *jivanti*, *chaupatiya*, *bathua*, *balmulaka*, *vartaka*, *patola*, *karvellaka*, *saindhava*, *anardana* and *amalaki* powder should be consumed. Because of the following qualities, these should be taken by the patients:

13. *Shali rice*: Sweet in taste, cold in potency, easily digestible, provides strength, mitigate *pitta* and unctuous²⁹.
14. *Jangala mansa rasa*: Best suited for those who are emaciated, convalescent, undergoing purificatory therapies, having chest injuries, who have been losing tissues, who are suffering from fractures, ulcers, good for the heart, best aphrodisiac, nourishing and satisfying food³⁰. *Jangal mansa* is astringent, sweet, in taste, light, and mitigates *vata-pitta* pungent, friendly to heart and urinary bladder cleanser³¹.
15. *Moong*: Astringent, sweet in taste, cold in potency, pungent after digestion, aggravates *vata* slightly (as compared to rest of the pulses), binds urine and faeces, mitigate *pitta* and *kapha*³².
16. Warm water: It mitigates *kapha*, *meda* and *vata*, helps in digestion, cleanses the urinary bladder, cures dyspnoea, cough and fever and compatible to all³³. Boiled water cures hiccup, abdominal distension, *vata-kapha* disorders, stimulate digestion, cooks the undigested food³⁴.
17. *Vilepi*: Withholds discharge of faeces and fluids from the body, heart friendly, relieves thirst, kindles appetite, ideal for all especially for those suffering from ulcers, eye diseases, after the purificatory therapies and who are weak³⁵.
18. *Chaulai*, *jivanti*, *chaupatiya*, *bathua*, *balmulaka*, *vartaka*, *patola* and *karvellaka* fried in ghee and added with *saindhava*, *anardana* powder and *amalaki* powder should be consumed by the patient. These vegetables help in faeces and urine elimination, slightly alkaline-sweet in nature, causes mild increase in *vata* and *kapha* and cure bleeding disorders³⁶.
19. The flesh of animals living in marshy places and water is *maha-abhishyandi* in nature, blocks the micro channels of the body, hence should be avoided³⁷.
20. The etiology factors are of three types: some disturb the equilibrium of *doshas*, some are disease producing and some not only disturb the *dosha* equilibrium but also cause disease production. Things, enumerated commencing with freshly harvested grains and ending with buttermilk is known as *dosha sanjanana varga*, viz these disturb the normalcy of tri-*doshas* in the body and thus deteriorate the condition, hence avoided³⁸. The clinician must pay close attention to the nutritional status of patients with wounds, because wound failure or wound infections may be no more than a reflection of poor nutrition. Malnutrition correlates clinically with enhanced rates of wound complications and increased wound failure following diverse surgical procedures³⁹.
21. The patient should not have excessive food consumption, indigestion, use of disliked food, consuming incompatible food, consuming food which is mixture of healthy and unhealthy food. The emaciated patient if indulge in his daily activities, the food taken by him is not digested properly. Because of indigestion, there will be aggravation of *vata*, *pitta*, and *kapha* leading to edema, burning sensation, suppuration, pain and exudation over the wound⁴⁰.
22. The patient should protect the wound during his daily activities. He should not indulge in standing, sitting, walking for long period and sleeping during day time. Since too much indulgence in these activities will aggravate *vata* and eventually lead to body ache. Movement itself delays wound healing. So rest is very essential for wound healing. The delicate capillary loop of the granulation tissue and delicate epithelium are damaged due to movement. Movement also causes entry of infections⁴¹.
23. Wine which is sour, dry, penetrating, and quick acting, if consumed destroys the patient's wound very quickly, so should be avoided.
24. He should avoid, even at distance, seeing, talking, and touching the woman. By these activities, the semen gets dislodged and flows out; then the person will derive all the bad effects of copulation though he did not have it actually. It can lead to pain in the abdomen, cough, fever, dyspnoea, emaciation, anemia, pulmonary tuberculosis, convulsions and such other diseases arise from excessive copulation⁴².
25. The patient should be clean, wear white dress, devoid of undesirable nails and hairs. Wearing neat and clean clothes enhances his grace, reputation and longevity, increases his wealth, makes his soul happy and makes him capable of sitting in the cultured assembly. Removing undesirable hairs and nails wards off sin bestows happiness, lightness, auspiciousness and enhances enthusiasm⁴³.
26. The patient should be surrounded by friends and relatives and spend his time, listening to stories which are benevolent, auspicious and pleasing to the mind. He who listening to stories bestowing wealth, auspiciousness and pleasantness to the mind, and remain hopeful for the betterment of his condition, obtains health quickly. Friends telling stories will drive away the discomfort of the wound and by comforting and pleasant conversation assure the patient.
27. The planning and provision of care shall be based on individual patient assessment and shall focus on the patient's response to actual or potential alterations to health. All patients are treated alike irrespective of their religion, cast, social status, financial ability etc. The safety of all patients seeking health care at this hospital is the prime responsibility of this hospital. A uniform patient care system is laid down in all areas so as to provide excellent service⁴⁴.

28. Value of staff behavior in delivery of medical care is well established to lessen patient's anxiety, reduces his drug requirement, hospital stay and cost of treatment and improves patient satisfaction. The staff behavior is the unique resource through which all other resources are channelized. It is a vital link in the process of medical care and therefore the main factor which structures hospital image, a cause of anxiety and concern for hospital administration⁴⁵.
29. Worshiping God, guest and *Brahmin* enhances the family chain, reputation, divinity, life span and wealth⁴⁶. Chanting *mantra* is a combination of sound, breath and rhythm that helps someone to channelize their energy. The vibration from *mantra* stimulates hypothalamus, which is responsible for many body functions including immunity and few happy hormones, which are responsible for better concentration, memory, healthy heart and keeping the body disease free⁴⁷. *Mantra* recitation is a part of physiological process of speech and influenced by *budhi* (intelligence), *manas* (Mind), *agni* (Flame), and *vayu* (Air)⁴⁸.
30. The patient should resort to observance of propitiatory and auspicious rites, devoted to god, brahmanas and teachers. Because the powerful demons who seek pleasure in harming others, followers of *Pashupati*, *Kuber* and *Kumara* who are fond of blood and flesh, wander near the patient either in search of blood, for receiving worship or for killing the patient⁴⁹.
31. Demons, who desire worship, should be worshiped with great devotion frequently offering fragrant smoke, ritual worship with prayers, flowers etc, oblations (flesh, blood etc. of animal killed). When these demons become satisfied with worship, oblation etc, they do not harm the patient.

Conclusion:-

The separate auspicious room for the patient in which the patient is surrounded by friends and relatives and the house decorated with proper lights, weapons, garland, flowers, etc. and there he spends his time in listening to stories which are auspicious and pleasing to the mind, it provides him a positive hope for the betterment of his condition, obtains health quickly. In follow up measures, the patient is properly educated about the compatible *aahar-vihar*, *aachar rasayana*, *dev-vyapashraya*, and *satavajyaya chikitsa*, so that post operative period would pass smoothly without any further complications. *Acharya Sushruta* has described the management of post operative complications in *Uttara tantra*. It has been called *Aupadravika*, since many of the complications of surgical procedures like fever, dysentery; cough, hiccup, anemia, jaundice etc are described here.

By following the proper conduct of all the rejuvenating actions of *paschatkarma*, immunity of the patient, digestive power, physical and mental strength of the patient is enhanced to a great extent. The wounded person who adheres to this regimen obtains health and long life surely. All the do's and don'ts prescribed herein are very relevant still in the present time. Gradually the world is recognizing the principles of health behind these regimens and adopting it with slight modifications, suitable to the living condition of the present day.

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