

A Narrative Review on Healing Wisdom: Unveiling the Power of Pathya-Apathya in Wound Recovery

DHRUV MODI¹, DEVYANI DASAR², NAVEEN SINGH³, KRISHNA SHINDE⁴

ABSTRACT

Ayurveda's distinctiveness lies in its use of *Ahara-Vihara* (dietic and daily regimes) as a therapeutic method. Sixty therapeutic protocols for wound healing have *ahara* (food) as one of the approach. Wound healing is a multifactorial mechanism where food plays a significant role in terms of micro and macro nutrients. In clinical practice, understanding *Pathya Kalpana* (conductive practises) is crucial as it considered as half of the treatment, *Ardha Chikitsa* (Partial Treatment) and it also stabilises digestive and metabolic fires (*jataragni* and *dhatwagni*). Prescribing medicines and ignoring a proper lifestyle and diet changes serve no purpose as it only defeats the symptoms of the disease without attending the root causative factors of a disease, as *Apathya* (non conductive practices) are the major causative factors of pathogenesis. Even a treatment protocol which can hit the bull's eye would fail, when a patient has inappropriate diet and indulges in improper activities of routine. The knowledge of influence of *shadrasa* (six tastes) in healing, method of eating, conducive and non conducive foods and regimes given in scriptures, properties and effects of the wholesome foods and its indications is beneficial for establishing a structured treatment protocol. Various types of wounds and different phases of wound healing can be approached by a specifically designed diet and regimes.

Keywords: *Ahara, Shashti upakrama, Vrana ropana, Vrana shodana*

INTRODUCTION

Wound healing is a dynamic and multifactorial dependent concern in surgical practice. Postoperative wound healing, healing of traumatic wounds and wounds due to multifactorial involvement like systemic and extrinsic factors like arterial, venous, diabetic ulcers, burn wounds, infections are the various spheres where wound healing is given prime importance [1]. In the current era of modernisation with rapid and poor lifestyle, the importance of knowing conducive and non conducive food habits and daily routines is a very essential and significant part of surgical practice [2]. Even a treatment protocol which can hit the bull's eye would fail, when a patient has inappropriate diet and indulges in improper activities of routine [3]. *Pathya*, which refers to a wholesome diet and lifestyle, is characterised by foods and habits that nourish both the body and mind, clear the body's microchannels (*Pantha/Marga/Srotas*), and promote overall well-being and happiness. In contrast, *Apathya* denotes an unwholesome diet and lifestyle that fails to provide these benefits [4]. The concept of good *pathya* (conductive) and *apathya* (unwholesome) regimes with a well detailed management approach would be a double edged sword for the wound healing as it can accelerate the treatment as well as eradicate the causative factors of pathogenesis. Acharya Charaka defines the *ahara* (diet) and *vihara* (lifestyle regimes) which is more beneficial and valuable to the body and also gives clarity and happiness to the mind as *Pathya* (wholesome) and opposite to that as *Apathya* (unwholesome) [5]. Contraindicated food items, if consumed by the wounded person may cause much suppuration and delayed healing. This concept works on *shareerika* (physical) and as well *manasika* aspects (mental levels) and accelerates the balance of *tridoshas* (three humours-*vata*, *pita*, *kapha*) required for optimum wound healing. *Aahara* (food) is called as *Mahabhaishajya* (superior medicine) in the *Kashyapa Samhita* (A Textbook by Acharya Kashyapa) [6]. Acharya Sushruta included *ahara* in *shasti upakrama* (60 types of treatment) as a treatment protocol to signify the role of food in wound healing [7]. There are general factors include *poshaka tatwa* (Nutrients), *vaya* (Age), and the diseases like *paandu* (Anemia) *madhumeha* (Diabetes), and local factors include *shalya vastu* (foreign bodies), *twak sthaan* (Position of skin) and *bhoota*

sanghaata (Infection) affecting wound healing [8]. The *Aahara Rasa* (essence of food) will get distributed in the body, where *Rasa Dhatu* (primary product of digested food) will be nourished then followed by *Rakta* (Blood tissue), *Mamsa* (muscle tissue), *Meda* (fat tissue), *Asthi* (bone tissue), *Majja* (bone marrow) and finally *Sukra* (essence of all dhatus) will get the required nourishment. This is the pathway nourishment of the *Dhatu* (tissues) [9]. The six tastes of food and the specific action of each food on *dosha* (humours), *dhatu* (tissues) and *agni* (metabolic fire) is the prime importance of dietic and routine regimes in Ayurveda [10]. By utilising the knowledge of treating the wound and its healing process together with appropriate provision of nutrition, one can decrease the morbidity and associated mortality tagged with chronic natured wounds, and also reduces their treatment cost and social impact [11].

Concept of Wound Healing in Ayurveda

Exogenous wounds are caused by trauma which further manifests because of *tridosha* (three humours) and *rakta* (blood). *Vata*, *kapha* and *pitta* (the three humours) when vitiated by their respective aetiologies get accumulated in external passage and produces endogenous ulcers [12]. Accumulation of vitiated *doshas* (humours) in *Sanchaya Avastha* (stage of accumulation), their *prokapa* (aggravation) and *prasara* (spread) to the wound location happens due to improper and faulty habits of diet and regimes, way of living and the seasonal variations [12]. The vitiated *dosha* (humours), after a sequele of pathological events (*shada-kriyakala*) get accumulated at a particular place resulting in the formation of *vrana* (wound). Eight locations of wounds are blood vessels (*sira*), skin (*Twak*), fat (*Meda*), flesh (*mamsa*), ligament (*sanyu*), bones (*asthi*), viscera (*Kostha*) and vital parts (*Marma*) [13].

The various stages of wound include *Amawastha* (early phase of inflammation), *Pachyamanawastha* (actual inflammatory phase) and *Pakwawastha* (suppurative phase), respectively [14]. Based on the degree of vitiation of *Dosha* (humours), Sushruta has classified *Vrana Shopha* (wound inflammation) into *Vatika*, *Kaphaja* and *Paittika* (dependent on each of the three humours independently) *Shonita*

(blood), *Sannipattaja* (combined state of all the three humours) and *Agantuja* (exogenic) which later attains suppuration due to *pitta* (heat) and *rakta* (blood) [15]. *Ruhyamana vrana* is the ulcer in healing phase while *ruda vrana* is the wound in healed phase [16].

Wound healing requires repair at cellular levels mediated by *tridosha* (three humours). After the digestion of ingested food by *Jatharagni* (digestive fire), tissue metabolism happens due to *Bhutagni Paka* (tissue level metabolic fire), it is absorbed and distributed throughout the body [17]. The *Dhatu-paka* (metabolic conversion of tissues) continues the chemical conversion into tissues at micro level which is important for wound healing [18]. At the level of the *Dhatvagnipaka* (tissue metabolism), the *Prasaada-bhaga* (essential part) contributes to the *Dhatu* formation (tissues), i.e., *Sthayi Dhatu* (stable tissues) and *Upadhatu* (subordinate tissues) while the *Kittabhaga* (non essential part) leads to the formation of the *Dhatu Malas* (metabolic wastes) [19]. The nutrient portion of the *Dhatu*s (tissues), provides nourishment to the successive other *Dhatu*s (tissues). The nourishment of all *Dhatu* (tissues) is the primary function of *Aahara Rasa* (essence of food). These are nourished in a sequential one after the other like *Rasa* (first level of tissues) nourishes *Rakta* (second level of tissues), *Mamsa* (third level of tissues) etc. The combination essence of all the *dhatu*s (tissues) nourishes *Sukra dhatu* (the seventh level of tissues), which is followed by *Ojas* (vital force of the body) [20]. Wound healing requires proper nourishment of the seven levels of tissues, strong metabolic fire at tissue levels without which chronic non healing wounds will fail to heal. The superficial wounds, involving skin only, heal easily and early in comparison to those extending to the other *Vrana vastu* (deeper tissues).

Factors Affecting Wound Healing in Ayurveda

Defects causing the faulty mechanism of wound healing are known to be 24 according to aetiological factors which are as follows: excessive moisture in ligaments, increased fluid in blood vessels, more depth of the wound, influence of maggots, involvement of bones, lodging of foreign body, toxin accumulation, spreading natured, traumatic tearing with nails or other objects, friction of skin and body hair over wound, improper bandage application, excessive local application of unctuous substance over wound, excessive emaciation of patient due to over dose, indigestion of food, over-eating before digestion, incompatible food consumption, unsuitable food habits, anger, grief, excessive day-sleep, sexual intercourse, physical exercise, and sedentary life and inactivity. These factors cause delay in the wound healing process. Ulcers with impurity are difficult to treat due to presence of excessive discharges, foul odors, major defects and multiple complications [Table/Fig-1] [21].

	Factors	Humoral imbalance	Effects
Diet	Intake of incompatible food items	<i>Agnimandhya</i> (reduced digestive fire) and <i>tridosha vikriti</i> (imbalance of three humours)	Lack of nutrition at cellular levels, leading to delayed or improper healing
	Unsuitable food		
	Indigestion		
	Overeating		
Regimes	Grief	<i>Pitta</i> and <i>vata prakopa</i> (excessive aggravation of two of the humours)	Increased suppuration and discharge from wounds
	Anger		
	Day-sleep	<i>Kapha</i> and <i>pitta prakopa</i> (excessive aggravation of two of the humours)	Delayed wound healing and increased wound secretions
	Excess physical exercise	<i>Vata prakopa</i> (excessive aggravation of one of the humours)	Improper healing and mal nourishment of wounds
	Sexual intercourse		
	Excess inactivity	<i>Kapha Prakopa</i> (excessive aggravation of one of the humours)	Delayed wound healing Increased wound secretions

[Table/Fig-1]: Factors affecting wound healing.

According to Acharya Charaka the Sarabhaga or Anna [22]

Rasa of the food ingested an outcome of *Jatharagni* and *Bhutagni Paka*, is absorbed from *Adho-Amasaya* and distributed throughout the body by *Dhamanis*. This process of absorption of *Annarasa* in the body is described under the concept of *Dhatvagni Paaka* or *Dhatvagnivyapara*. In the term *Dhatvagni Paaka*, two terms are important to discuss that is *Agni* and *Paaka*. *Paaka* was seen to stand for chemical transformations both reversible and non reversible.

Role of Shadrasa (Six Tastes) in Wound Healing

A balanced approach of inculcating *Shadrasa* (six tastes) in diet is ideal for wholesome health whereas wound healing phase needs a more considerate approach of the six rasas [23]. *Madhura rasa* (sweet taste) is dominant in *Prithvi* and *jala mahabhuta* (earth and water elements), increases *kapha* (phlegm humour) and has *sandhanakara* (binding) and *bal-krita* (strengthening) actions, while *amla rasa* (sour taste) is dominant in *Prithvi* (earth element) and *agni Bhuta* (fire element), increases *kapha* (phlegm humour) and *pitta* (bile humour) and forms *puya* (pus) causing *vidaha* (burning sensation) in the wound. *Lavana rasa* (salt taste) made of predominantly *jala* (water element) and *agni mahabhuta* (fire element) increases *kapha* (phlegm humour) and *pitta dosha* (bile humour), due to *vishleshan* (breaking down) and *lekhana karma* (scrapping action), performs the role of *vrana shodhana* (wound cleaning) and *katu rasa* (pungent taste) possesses qualities like *vrana shodhana* (wound cleaning), *kushtaghna* (skin disease eradicating), *krimighana* (anti-microbial), and *lekhana* (scrapping actions). *Katu rasa* (pungent taste) is *vayu* (air element) and *agni* (fire element) dominant and increases *vata* (air element). *Tikta rasa* (bitter taste) made of *vayu* (air element) and *akasha* (ether element) strengthens *twak* (skin) and *mamsa dhatu* (muscle tissues) and dries up *kapha* (discharge), increases *vata* (air humour) while *kashaya rasa* (astringent taste) made of *vayu* (air element) and *Prithvi* (earth element), increases *vata* (air humour), possesses *kleda shoshaka* (dries up discharge), *vrana shodhana* (wound cleaning) and *ropana* (wound healing) properties [11]. *Tikta Rasa* (bitter taste) is considered supreme for wound healing and all the *vrana shodana* (wound cleaning) and *ropana* (wound healing) drugs are predominantly *tikta* (bitter) in *rasa* (taste) It helps for platelets migration and binding to the site of injury and its proliferation because of the dominant *Vata Dosha* (one of the humour) function and also enhances proper division of cells respectively. Release of target chemicals & activation of fibrin and its subsequent transformation is the work of *Pitta Dosha* (one of the humour). Formation of platelet plug and clot for hemostasis sequence is related to the attributes of *Kapha Dosha* (one of the humour). It also helps in scavenging of tissue debris and pathogens because of its dry and cold nature and attribute of lesser weight [Table/Fig-2] [24,25].

Taste	Elemental composition	Role in wound healing
<i>Madhura</i> (sweet)	Earth and water	Binding tissues, strengthening and granulation
<i>Amla</i> (sour)	Earth and fire	Increases wound secretions
<i>Lavana</i> (salty)	Water and fire	Scrapping action
<i>Katu</i> (pungent)	Air and fire	Increases cell division and dries the wound
<i>Tikta</i> (bitter)	Air and ether	Hemostasis, wound cleaning and wound healing
<i>Kashaya</i> (astringent)	Air and earth	Dries up wound, wound cleaning and healing

[Table/Fig-2]: Influence of the six tastes in wound healing.

Ahara Vidhi Vidhana (Method to Eat)

Along with the quantity of diet and the quality of food, the way of food consumption too plays a vital role in the maintenance of health. The process of digestion, nutrient absorption, and assimilation of digested food are complex procedures where social, physical, emotional and

physiological factors contribute a vital role. For obtaining optimum benefits of food, a person should practise certain rules and regulations according to Ayurveda regarding what to consume, when and where to eat, and how the food should be taken. Classification of food according to age, purpose, benefits, seasons, constitution, foods which are daily consumable and non consumable, helps in achieving the balanced diet for one's constitution according to age and seasonal variations. The complete beneficial assimilation of food takes place when these rules for consumption of food are followed and this is known as *Ahara vidhi Vidhana* [26]. One should consume food that is warm in state except in diseases dominant in pitta (one of the humour) and rakta (blood) vitiation. Consuming food in warm state helps in retaining the maximum taste of food, stimulates the digestive fire, and undergoes easy digestion. Unctuous food is advised except in kapha (phlegm humour) and medho dhatu (adipose tissue) vitiation, because it will increase the subdued power of digestion in a similar manner that ghee ignites fire. It will strengthen the sense organs and will enhance growth, strength, and complexion of the body. The quantity of food taken that gets digested in proper time without affecting the normalcy of the body is called as *Maatra* or the measure of proper quantity [27]. The next diet should be taken only after the proper digestion of previous food. If, taken otherwise, the improperly digested *Ahararasa* (primary product of digestion) of the previous meal gets mixed up with *Ahararasa* (product of digestion) of the newly taken food and instantaneously aggravates all *Doshas* (humours) [28]. One should consume food that is non contradictory in *Virya* (potency). Food should be consumed in a beautiful and auspicious place that is devoid of *Vaastu Dosha* (Unpropitious land) and unwanted people, having a pleasant smell, and that is well covered in order to provide protection from dust and other organisms [29]. One should not consume food in haste to prevent entry of food in the wrong passage resulting in asphyxiation of food. One should not consume food very slowly as it prevents satisfaction or satiation, leading to over eating. Food becomes cold leading to improper digestion. The food consumed while talking, laughing, or with a distracted mind produces complications due to vata vitiation. Food should be always consumed with due consideration to oneself, knowing well about the suitability or the unsuitability of the food components to the self. Thus, one should consume food only after proper self-consideration [30].

Concept of Anupana (Adjuvants Taken after Food) and Sahapana (Adjuvants Taken Along with The Food)

Anupana is explained as a liquid, which can be taken after the intake or along with the *Aushada* (medicine) or *Ahara* (food) [31]. The term *Sahapana* is defined as the medicine administration by mixing it with another liquid substance which can result in easy disintegration of food, absorption and uniform optimum assimilation of medicine completely in the body [32]. Appropriate administration of adjuvants with foods facilitates energising the body quickly, helps in required digestion resulting in the benefits of promotion of longevity and strength. Adjuvants softens and liquefies the hard food. The food which is non wholesome or heavy in nature, or when taken in excessive quantity undergoes easy digestion by the action of the adjuvants. When a small quantity of water is consumed between a meal, the food remains moist, instead of becoming dry and difficult for digestion. Therefore, Anupana (co-administers with medicine) has its importance in diet regimes [33]. Drugs with wound healing properties can be taken and infused along as adjuvants in the early phase of wound healing and strength promoting foods can be used for chronic wound patients.

Pathya Ahara (Wholesome Food) for Wound Healing

In the inflammatory phase of wound healing, *ahara* (food) with *tiktta* (bitter) and *kashaya rasa* (astringent taste), *Madhura vipaka* (sweet taste post digestion) and cold potency should be the choice to control inflammation. In proliferative stage *Madhura-kashaya rasa* (sweet and astringent taste) and cold potency should be the choice of food as astringent taste has wound contraction activities and *Madhura rasa* (sweet taste) helps in tissue regeneration and cold potency has *sthambana* (retaining) action [34]. In remodelling phase, *Madhura rasa* (sweet taste) and *sheeta virya* (cold potency) and *Madhura vipaka* (sweet taste post digestion) foods should be preferred as *Madhura rasa* (sweet taste) attributes to wound strength and also increases tissue granulation [34,35]. The observations revealed that the plants mentioned under *Kakolyadi*, *Nyagrodhadi*, *Lakshadi*, *Aaragvadhadi*, *Surasadi*, *Arkadi* and *Priyanguambasthadi Gana* (group) have significant properties of *Vrana-Shodhana* (wound cleansing) and *Vrana-Ropana* (wound healing) [Table/Fig-3] [34-40].

	Pathya Ahara	Apathya Ahara
Charaka [36]	<i>Na Ati Sheet</i> (mild cold potency foods), <i>Na Ati Guru</i> (strengthening foods), <i>Na Ati Snigdha</i> (mildly unctuous), <i>Avidahi</i> (foods without burning tendency)	<i>Lavan</i> (salty), <i>Amla</i> (sour), <i>Katu</i> (extremely pungent), <i>Ushna</i> (extremely hot potency foods), <i>Vidhahi</i> (foods with burning tendency), <i>Guru</i> (heavy foods), <i>Viruddhanna</i> (mutually contradictory foods)
Sushruta [37]	<i>Jeerna Shaalyodana</i> (old rice), <i>Jangala Mamsa</i> (arid meat), <i>Tanduliyaka</i> (A type of Amaranth), <i>Jivanti</i> (Leafy vegetable called <i>Leptadenia reticulata</i>), <i>Sunishannak</i> (herb called <i>Marsilea quadrifolia</i>), <i>Vastuk</i> (chénopodium), <i>Bal Mulak</i> (immature radish), <i>Vartak</i> (brinjal), <i>Patol</i> (pointed gourd), <i>Karvellak</i> (bittergourd), <i>Dadima</i> (pomegranate), <i>Amlaki</i> (Indian gooseberries), <i>Saindhav</i> (a type of salt), <i>Mudga Rasa</i> (green gram soup), <i>Saktu</i> (powder of barley) <i>Vilepi</i> (porridge), <i>Kulmasha</i> (barley powder soaked in water and cooked), <i>Shrit-Jala</i> (luke warm water)	<i>Navadanya</i> (newly harvested grains), <i>Masha</i> (urad dal), <i>Tila</i> (sesame), <i>Kalaya</i> (peanuts), <i>Kulatta</i> (horse gram), <i>Nishpava</i> (flat beans), <i>Haritaka</i> (spinaches), <i>Amla</i> (sour taste), <i>Lavana</i> (salt taste), <i>Katu Rasa Pradhana Dravyas</i> (excessively pungent food), <i>Guda Pishta Vikruti</i> (jaggery foods), <i>Vallura</i> , <i>Shushka Shaka</i> , <i>Aja</i> (mutton), <i>Avi</i> (sheep meat), <i>Aanupa</i> (aquatic meat), <i>Oudaka Mamsa</i> (fishes), <i>Shitodaka</i> (cold water), <i>Krushaara</i> (sweet porridge), <i>Dadhi</i> (curd), <i>Dugdha</i> (milk), <i>Takra</i> (fermented buttermilk)
Vagbhata [38]	<i>Yava</i> (barley), <i>Godhuma</i> (wheat), <i>Sashtika</i> (a type of rice grown in 60days), <i>Masura</i> (red lentils), <i>Mudga</i> (green gram), <i>Tuvari</i> (pigeon pea), <i>Jivanti</i> (Leafy vegetable called <i>Leptadenia reticulata</i>), <i>Sunishannak</i> (herb called <i>Marsilea quadrifolia</i>), <i>Bal-Mulaka</i> (immature radish), <i>Vartaka</i> (brinjal), <i>Tanduliyak</i> (type of Amaranth), <i>Vastuka</i> (chénopodium), <i>Karvellak</i> (bitter gourd), <i>Karkota Momardica dioica</i> (spiny gourd), <i>Patola</i> (pointed gourd), <i>Katukaphala</i> (bottle gourd), <i>Saindhava</i> (a type of salt), <i>Dadima</i> (pomegranate), <i>Dhatri</i> (Indian gooseberries), <i>Ghrita</i> (ghee), <i>Jala</i> (water), <i>Jangala Mamsa Rasa</i> (soups of arid meat)	<i>Nava Dhanya</i> (newly harvested grains), <i>Tila</i> (sesame), <i>Masha</i> (urad dal), <i>Ksheera</i> (milk), <i>Ikshu-Vikruti</i> (sugarcane food preparations), <i>Amla</i> (sour foods), <i>Katu</i> (pungent foods), <i>Visthambi, guru</i> (heavy foods), <i>Vidahi</i> (foods causing burning sensation), <i>Sheeta</i> (cold foods), <i>Madhya</i> (alcohol)
Bhaisajya ratnawali [39]	<i>Jeerna Shaalyodana</i> (old shali variety of rice), <i>yav</i> (barley), <i>pishtika</i> , <i>godhuma</i> (wheat), <i>jangala mamsa</i> (meat of animals in dry regions), <i>vilepi</i> (porridge), <i>lajamanda</i> (puffed rice), <i>ghrita</i> (ghee), <i>madhu</i> (honey), <i>katu taila</i> (mustard oil), <i>sharkara</i> (sugar), <i>masura</i> , <i>tuvari</i> , <i>mudga</i> (green gram), <i>yusha</i> (vegetable soup)	<i>Naveena anna dhanya</i> (newly harvested grains), <i>tila</i> (sesame), <i>Kalaya</i> (peanuts), <i>masha</i> (urad dal), <i>kulatta</i> (horse gram), <i>krishara</i> , <i>sheeta jala</i> (cold water), milk and milk products, curd khowa etc., sugarcane and its derivatives, leafy vegetables, alcohol, all <i>mamsa</i> (meat) except <i>jaangala mamsa</i> (arid meats), <i>katu</i> (pungent foods), <i>amla</i> (sour foods), <i>lavana</i> (salty foods), <i>sheeta</i> (cold foods), <i>guru ahara</i> (heavy foods)
Yoga ratnakar [40]	<i>Yava</i> (barley), <i>Sashtika</i> (type of rice grown in 60 days), <i>Godhuma</i> (wheat), <i>Shali</i> (red rice), <i>Yusha</i> (<i>Masura</i> , <i>Tuvari</i> , <i>mudga</i>), (soup made of lentils, horsegram, green gram) <i>Madhu</i> (honey), <i>Vilepi</i> (porridge), <i>Laj-Manda</i> (puffed rice), <i>Jangala Mriga-Pakshi</i> (meat of animals and birds of dry lands) <i>Ghrita</i> (ghee), <i>Taila</i> (oil), <i>Patola</i> (pointed gourd), <i>Bal Mulaka</i> (immature radish), <i>Vartaka</i> (brinjal), <i>Karvellaka</i> (bittergourd), <i>Karkota</i> (momardica dioica), <i>Tanduliyaka</i> (Amaranth)	<i>Ruksha</i> (dry foods), <i>Amla</i> (sour preparations), <i>Sheeta</i> (cold foods), <i>Lavana</i> (salty foods), <i>Viruddhashana</i> (mutually contradictory foods), <i>Tambula</i> (betel leaves), <i>Patra-Shaka</i> (leafy vegetables), <i>Ajangal Mamsa</i> (mutton)

[Table/Fig-3]: List of conducive and non conducive foods according to various acharyas.

Vegetables like *Karavellaka* (bitter gourd) and *patola* (pointed gourd) are included in *Aragwadadhi Gana*. Both are bitter and pungent in taste, light and dry in nature, has pungent effect post digestion, *kapha pitta hara* (reduces humours) and can be used in diets of patients with non healing wounds. Bitter gourd has antimicrobial action, it can be used in diet of infected wound patients. *Karkota Momardica dioica* (spiny gourd) has similar properties of bittergourd [41]. Pointed gourd is carminative and is loaded with vitamin c and it reduces and balances all the three *doshas* (humours) [42]. *Vartaka* (brinjal) reduces ama (metabolic tissue) is very light to digest and kindles digestive fire. It slightly balances excess *kapha* and *vata dosha* (humours) [43]. *Baala-mulaka* (immature radish) is included in *pippalyadi* and *surasadi gana* by Acharya Sushruta. Its attributes are similar to that of pointed gourd. It is highly condusive as it redcues and balances all the thre humours [44]. *Vaastuka* (Green leafy vegetable-*Chenopodium album*) is sweet in taste, light and hot in potency and has pungent effect after digestion. It balances all the three humours, has anti-microbial action and also relieves pain [45]. *Tanduleeyaka* (A type of Amaranth) is sweet in taste and reduces inflammation and bleeding and is anti-poisonous and *Jeevanthi shaaka* is one among the drug in *Kakolyadi gana*, *Kashaya varga* and *Shakavarga* and is considered the best vegetable for consumption [46,47].

Dadima (Pomegranate) is sweet and astringent in taste, light and unctuous in properties, has a neutral potency, sweet and sour after digestion taste and balances all the three doshas. It is light for digestion, absorbent, carminative increases body strength and burning sensation [48]. *Amalaki* has five tastes namely, sour, astringent, bitter, pungent and sweet in taste where sour and astringent tastes are predominant [49]. It is slightly heavy, dry, has mild cold potency. The taste developed through digestion is sweet. It alleviates all the three dosha and is considered the best of the Ayurvedic rejuvenative herbs as it rejuvenates all of the tissues in the body and builds Ojas (the essence of immunity) [50].

Mudga (*Vigna Radiata*) belongs to pulses, and is one of the Sarva Prani *Pathya Ahara Varga*, a set of food items regarded as both among the finest and dietary items suitable for all animals and is considered *Nityasevaneeya*, or food that should be consumed every day to maintain good health as it is light to digest, mildly dry in nature and gives nourishment, enhances physical strength and builds the tissues [51]. *Yava* (Barley) is astringent and sweet in taste *rasa* is carminative, builds stability and strength. It enhances skin repair too. It can be used in patients of chronic wounds and diabetic wounds [52].

Vilepi (porridge) is made by boiling rice and water in the ratio 1:4. The rice is boiled till it becomes soft and it consists more solid portion. It is refreshing, satiating, strength increasing, wholesome, sweet, light, stimulates digestive power, and allays hunger and thirst. It subside *pitta* (one of the humour) [53]. *Mamsa rasa* (meat soup) is of two types. *Kruta Mamsarasa* is prepared by adding ghee/oil, salt and mild spices, whereas *akruta mamsarasa* is prepared without additions. It is *Oja Vardhaka* (improves vitality), *Brumhana* (nutritive) and gives *preenana* (nourishment) [Table/Fig-4] [54-56].

Pathya Aahara (Unwholesome Food) for Wound Healing

In the inflammatory phase of wound healing food with excessive sour, pungent and salty taste is avoided. Food with hot potency like curd, alcohol and other *vidahi* (burning foods) increases the duration and extent of inflammation. These also delay the wound healing phase. Dry foods increases *vata* (one of the humour) and affect the quality of granulation and wound healing. Sugarcane and jaggery processed foods, aquatic animals meat increases *kapha* (one of the humour) and *gurutwam* (heaviness) and reduces the metabolic fire leading to reduced nourishment to successive tissues hampering the wound healing mechanism. Mutually contraindicated foods (*virudhanna*) are also avoided for the same reason [57].

Vegetables	<i>Jeevanthi shaaka</i>	Leafy vegetable called <i>Leptadenia reticulata</i>
	<i>Tanduleeyaka shaaka</i>	Red variety of <i>Amaranthus</i> leafy vegetable
	<i>Vaastuka</i>	Green leafy vegetable- <i>Chenopodium album</i>
	<i>Baalamlulaka</i>	Tender <i>Raphanus sativus</i> (Radish)
	<i>Vaartaka</i>	<i>Solanum melongena</i> (Brinjal)
	<i>Patola</i>	<i>Trichosanthes cucumerina</i> (Bitter variety of snake gourd)
	<i>Sunishannak</i>	herb called <i>Marsilea quadrifolia</i>
	<i>Vastuk</i>	<i>Chenopodium</i>
	<i>Karkota</i>	<i>Momardica dioica</i> (spiny gourd)
	<i>Katuka phala</i>	<i>Lagenaria siceraria</i> (bottle gourd)
	<i>Karavellaka</i>	<i>Momordica charantia</i> (bittergourd)
Fruits	<i>Daadima</i>	<i>Punica granatum</i> (pomegranate)
	<i>Grutha bhrusta amalaki</i>	<i>Embelica officinalis</i> roasted in ghee
Pulses	<i>Mudga</i>	<i>Vigna Radiata</i>
Adjuvents	<i>Saindhva lavana</i>	Potassium chloride salt
	<i>Purana sarpi</i>	Old stored cow ghee
Preparations	<i>Vilepi</i>	Thick rice gruel
	<i>Mamsa rasa</i>	Clear chicken soup

[Table/Fig-4]: Specifically indicated variety of food for wound healing.

Pathya and Apathya Vihara (Wholesome and Unwholesome Activities) for Wound Healing

The patient should not sleep during day as it increases *kapha* and *pitta* and cause itching in the wound, swelling, feeling of heaviness of the body, pain, redness and exudation. The wounded person should not indulge in standing, sitting, walking for long period and sleeping during day, though he is strong as too much indulgence produces pain in the body parts due to aggravation of *vata* (one of the humours) [58].

According to Ayurveda, patients having strong psychological status have a good compliance and thus respond better to the treatment. The person who cannot control his/her anger or remains under fear may redevelop the wounds at the same site. Even many more psychological factors have been elaborated by our ancient scientists in the reference of wound. There is evidence that greater mental stress prior to surgery results with poorer outcomes, including postoperative complications, delayed healing, higher rates of re-hospitalisation, and poor wound healing rate [59]. After surgery, recovery phase is greatly influenced by psychological factors like stress and anger. Patient should avoid sexual activities to preserve *bala* (strength) and *ojas* (vitality). One should never have too much exposure to breeze, dust, sunlight, smoke, dew, mist, eating excess quantity food, use of unliked foods, the feeling of fear, jealousy, grief, anger, worry, staying awake at night, eating incompatible foods, irregular sleep schedules, fasting, speaking at a loud voice and strenuous physical activities. One should also avoid roaming in forbidden places. When the wounded person, troubled by the above causes, and patients who have weak constitution with excessive muscle and blood depletion, the ingested food does not get digested. Indigestion will cause great aggravation of all the three humours which produce pain, swelling, exudation, pus formation and burning sensation. A wounded patient should avoid the use of spirituous liquors such as *Asava*, *Mairaya*, *Arishta*, *Sura* and *Sidhu* (alcoholic preparations). A wound may develop into malignancy through the use of alcoholic preparations which is acidic in taste, sharp, dry with hot potency, or is followed by almost instantaneous intoxication [60].

DISCUSSION

Person who regularly consumes *Hita Ahara* (Beneficial food) and does *Hita Vihaara* (beneficial regmies) becomes disease free thus

establishing *Pathya* (wholesomeness) to be a primary principle in the treatment [61]. *Tikta Rasa* (bitter taste) pacifies *Kapha dosha* (one of the humour) because it is opposite natured which is considered to be beneficial in the mechanism of wound healing [62]. If, one approaches diet considering the state of tridosa (three humours), *prakriti* (bodily constitution), *satmya* (condusiveness) of person as well as *panchabhautik* (five elemental) composition of food. *Pathya* (wholesome) regimen is explained elaborately in Ayurveda which plays a foremost important role in prevention as well as cure of different diseases. Due consideration is given to the atmosphere of place, psychological condition of the person, status of health and digestion of the person. The diet should also be based on the age, seasonal changes, habitat and habit of the person. Consumption of medicines without prescribed food and lifestyle regimes changes serve no purpose as it merely tackles the symptoms of a disease without terminating the root aetiology of a *Vyadhi* (disease) [63]. *Apathya* (unwholesome) as a *Nidana* (aetiological factor) for a *Vyadhi* (disease). No treatment is helpful without counteracting the aetiology of the ailment/*Apathya*. Hence, thorough understanding of sequalae of pathophysiology and aetiopathogenesis is very important to approach diseases [29]. Optimum quantity of porridge cooked from old rice served in unctuous and warm state with little water, and meat of animals of arid regions when consumed regularly helps in healing of the wound quickly. Soups, *saktu* (paste of flour), *vilepi* (thick gruel), *kulmasa* (cooked pulses) and boiled water may be consumed [64]. The wounded patient who adheres to the wholesome regimes gets timely and ideal healing.

CONCLUSION(S)

Ahara is very aptly placed in the sixty therapeutic approaches for wound healing. Food when rightly consumed can work par with a medicine in healing a patient. The right choice of food, the right combination, the right quantity, the right proportions and the right method and time to eat is a knowledge which has to be imparted by the doctor, to achieve optimum healing of the disease, prevention and also to improve the quality of living. Behavioural regimes when followed help in achieving a mental balance which in turn aids in the physiological healing.

Acknowledgement

Authors extend their heartfelt gratitude to all individuals who contributed to present project. Their dedication and support were invaluable. Special thanks to the mentors for their guidance and expertise. Authors also appreciate the funding agencies for their financial assistance, which made this work possible.

REFERENCES

- [1] Kirsner RS, Eaglstein WH. The wound healing process. *Dermatologic Clinics*. 1993;11(4):629-40.
- [2] Weimann A, Braga M, Carli F, Higashiguchi T, Hübner M, Klek S, et al. ESPEN guideline: Clinical nutrition in surgery. *Clin Nutr*. 2017;36(3):623-50.
- [3] Fearon KC, Ljungqvist O, Von Meyenfeldt M, Revhaug A, Dejong CHC, Lassen K, et al. Enhanced recovery after surgery: A consensus review of clinical care for patients undergoing colonic resection. *Clin Nutr*. 2005;24(3):466-77.
- [4] Panda AK, Sahoo PK, Nayak BP. Pathya and apathya (Wholesome & Unwholesome diet and regimen) in yakrit kshaya (Liver Cirrhosis): A narrative review. *Journal of Ayurveda and Integrated Medical Sciences*. 2020;5(05):419-25.
- [5] Chauhan S, Rupali, Sonali T, Indu. Importance of pathya-apatya in ayurveda: A review article. *Journal of Ayurveda and Integrated Medical Sciences*. 2023;8(12):125-29.
- [6] Lal R, Jain MK, Choudhary S. A review article on pathya-apatya of charak samhita. *World Journal of Pharmaceutical Research*. 2023;12(4):1703-715. Doi: 10.20959/wjpr20234-27344.
- [7] Tonni SS, Wali AA. Dietary considerations of wound healing in ayurveda. *J Nutr Food Sci*. 2013;3(5):01-04.
- [8] Girgune CS. Concept of Dhatu, Dhatu Poshana with reference to Sharira Bala. *Journal of Ayurveda and Integrated Medical Sciences*. 2020;5(01):244-47.
- [9] Nigam T, Tiwari SN, Acharya P, Pande P. Clinical aspects of strotro dushti and kha vaigunya in disease management. *World Journal of Pharmaceutical Research*. 2023;12(10):146-62. Doi: 10.20959/wjpr202310-28451.
- [10] Katariya KS, Mishra BR. Shad Rasa and their effect on the body. *Journal of Ayurveda and Integrated Medical Sciences*. 2021;6(6):124-30.
- [11] Marathe VS, Sant SS, Tapadiya VR, Ingle S, Bansode RM, Ugale K. Concept of panchmahabhuta and critical review on its relation with Tridosha, Triguna and Shadrasa. *World Journal of Pharmaceutical Research*. 2020;9(15):761-68.
- [12] Binya VB, Abdul Shukkoor MM, Subi NH. Concept of Shadkriyakaala of Vrana by Susrutha WSR to venous ulcer. *Int J Ayur Pharma Res*. 2020;8(10):38-46.
- [13] Shamsuddin T, Alam MS, Junaid M, Akter R, Hosen SM, Ferdousy S, et al. Adhatoda vasica (Nees.): A review on its botany, traditional uses, phytochemistry, pharmacological activities and toxicity. *Mini Reviews in Medicinal Chemistry*. 2021;21(14):1925-64.
- [14] Santhosh KS, Channabasavanna BM, Mallikarjun. Vrana Shopha- An ayurvedic perspective. *Journal of Ayurveda and Integrated Medical Sciences*. 2017;2(02):224-28.
- [15] Fatima SA, Vishwanath, Kumar M. Clinical approach to Vrana Shopha wsr to inflammatory swelling. *Journal of Ayurveda and Integrated Medical Sciences*. 2018;3(04):148-53.
- [16] Sathish HS, Rashmi TM, Thirunavukkarasu MS, Mithun B, Narmada MG. Sushruta's eight pearls for infective ulcer. *Journal of Ayurveda and Integrated Medical Sciences*. 2017;2(05):142-53.
- [17] Vani G, Prasad JSR. Concept of Agni and Aharapaka (metabolic transformation) in ayurveda. *Int Ayurvedic Med J*. 2013;1(4):01-07.
- [18] Sharma V, Chaudhary AK. Concepts of Dhatu Siddhanta (theory of tissues formation and differentiation) and Rasayana; Probable predecessor of stem cell therapy. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2014;35(3):231-36.
- [19] Agrawal AK, Yadav CR, Meena MS. Physiological aspects of Agni. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2010;31(3):395-98.
- [20] Pavithra Jaivarshaa GV, Dasar D, Kumar A, Biswas S. Concept of Vaikritapaham for the management of scar in ayurveda- A critical review. *Int J Life Sci Pharma Res*. 2023;13(3):L17-L22. Available from: <https://www.ijlpr.com/index.php/journal/article/view/1654>.
- [21] Pathan A, Kullolli V, Pathan S. An ayurvedic perspective of Vrana. *World Journal of Pharmaceutical and Life Sciences (WJPLS)*. 2019;5(6):192-200.
- [22] Usharani LR, Katti BH, Goudar V, Sajjanshetty MR. Review on Agni wsr to Jatharagni and its role in Amotpatti. *Journal of Ayurveda and Integrated Medical Sciences*. 2021;6(01):157-65.
- [23] Agnivesha, Charaka Samhita with Ayurveda Deepika Teeka of Cakrapanidatta, edited by Yadavji Trikamji Acharya. Varanasi: Chaukambha Sanskrit Sansthan; 2004. Chikitsasthan chapter 15th, page. no 514.
- [24] Agnivesha. Charaka Samhita with Ayurveda Deepika of Cakrapanidatta, edited by Yadavji Trikamji Acharya. Varanasi: Chaukambha Sanskrit Sansthan; 2004. Chikitsasthan chapter 15th, page. no 512.
- [25] Sheoran S, Khanam B, Khane RS, Mahanta V, Gupta SK. A systemic review on vrana and it's management. *World Journal of Pharmaceutical Research*. 2019;8(12):299-317.
- [26] Sawai RV, Binorkar S, Suke DU, Karande SP. Ahara vidhi: Concepts of food intake in ayurveda with comparison to present era. *International research journal of India*. 2016;1:1-6.
- [27] Allam RK, Sundari CH, Vishwanath J, Renu D, Bhaskara R. The various factors affecting Bhesajya Matra (Dose) and the importance of Dasavidha Pariksha in deciding the proper matra. *Int J Ayu Pharma Res [Internet]*. 2015;3(9):45-53. Available from: <https://ijapr.in/index.php/ijapr/article/view/83>.
- [28] John S, Ananda Lakshmy KN, Sivaram A. The art of eating right: Ahara Vidhi Vidhana in ayurvedic perspective. *International Journal of Biological and Pharmaceutical Sciences Archive*. 2024;7(1):122-28.
- [29] Sankar RN, Harjpal L, Chandrakar R, Naik S. A review article on Ahara Vidhi Vidhana (Rules for consuming food) in consonance with Charaka Samhita. *Journal of Indian System of Medicine*. 2021;9(3):161-65.
- [30] Rakha A, Mehak F, Shabbir MA, Arslan M, Ranjha MM, Ahmed W, et al. Insights into the constellating drivers of satiety impacting dietary patterns and lifestyle. *Frontiers in Nutrition*. 2022;9:1002619.
- [31] Jaseela VK, Krishna JG. Anupana- A critical review. *Journal of Ayurveda and Integrated Medical Sciences*. 2019;4(05):311-17.
- [32] Martinez MN, Amidon GL. A mechanistic approach to understanding the factors affecting drug absorption: A review of fundamentals. *The Journal of Clinical Pharmacology*. 2002;42(6):620-43.
- [33] Deogade MS. A brief review on Anupana (vehicle). *Int J Res Ayurveda Med Sci*. 2020;3(1):46-50.
- [34] Kumar V, Nesari TM, Ghildiyal S, Sherkhane R. Pharmacodynamic appraisal of wound-healing herbs of Sushruta Samhita. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2021;42(1):01-18.
- [35] Yashasvi FH, Nagaraj K. Relation of Tikta rasa with physiology of wound healing-a review. *EPRA International Journal of Multidisciplinary Research (IJMR)*. 2024;10(1):632-34.
- [36] Kumar V, Nesari TM, Ghildiyal S, Sherkhane R. Pharmacodynamic appraisal of wound-healing herbs of Sushruta Samhita. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2021;42(1):01-08.
- [37] Bhat KS, Vishwesh BN, Sahu M, Shukla VK. A clinical study on the efficacy of Panchavalkala cream in Vrana Shodhana wsr to its action on microbial load and wound infection. *AYU (An International Quarterly Journal of Research in Ayurveda)*. 2014;35(2):135-40.
- [38] Ghodela NK, Dudhamal TS, Kumar A. Vrana shodhana and vrana ropana properties of Aragwadhadhi gana- A brief review. *Ayurpharm Int J Ayur Alli Sci*. 2017;6(10):204-14.
- [39] Sneha KJ, Masalekar S, Chandrakala D. Conceptual study on efficacy of Lajalu Moola Taila in Sadhyovrana. *Journal of Ayurveda and Integrated Medical Sciences*. 2024;9(2):245-49.

- [40] Nair SC, Sweta KM. To evaluate the role of Lakshadi Avachoomana in the management of Dushta Vrana with special reference to diabetic ulcer: A case study. *Journal of Ayurveda and Integrated Medical Sciences*. 2022;7(9):196-205.
- [41] Jan B, Rizvi QU, Shams R, Dar AH, Singh A, Khan SA. Bitter gourd. Antioxidants in vegetables and nuts-properties and health benefits. 2020:175-89.
- [42] Narwade SS, Kulkarni JV, Ghotankar AM. Concept of Pittashmana effect of Patola: A review article. *World Journal of Pharmaceutical Research*. 2021;10(7):145-48.
- [43] Sharma S, Brar JS. Nutritional requirements of brinjal (*Solanum melongena* L.)- A review. *Agricultural Reviews*. 2008;29(2):79-88.
- [44] Yadav MD, Kadam MB. A critical review on Bharangi (*Clerodendrum serratum* Linn) with special reference to Brihat Trayi (Charak Samhita, Sushruta Samhita and Ashtanga Samhita). *International Journal of Ayurveda and Pharma Research*. 2024;12(7):72-75.
- [45] Acharya Sushruta, Sushruta Sutrasthana, 46th chapter, Shloka no. 230, Hindi translated by Dr. Ambika Dutt Shastri. Varanasi: Chaukhambha Sanskrit Sansthan; 2007. Pp. 411.
- [46] Chandrashekar K. A review on Tanduliyaka (*Amaranthus spinosus* L.)- A weed, a vegetable and a medicinal plant. *Int J Ayurvedic Med*. 2018;9(4):231-38.
- [47] Naik R, Acharya RN. A review on therapeutic potentials of "Jivanti" in Ayurveda. *Anveshana Ayurveda Medicinal Journal*. 2015;1(6):442-49.
- [48] Patel VK, Acharya R. Dadima (*Punica granatum* L.), as an Aushadha (medicine), depicted in ayurveda: A comprehensive review. *Journal of Indian System of Medicine*. 2021;9(1):12-20.
- [49] Charkmar NK, Singh R. Emblica officinalis Gaertn. (Amla): A wonder gift of nature to humans. *Int J Curr Microbiol App Sci*. 2017;6(7):4267-80.
- [50] Bhat PM, Umale H, Lahankar M. Amalaki: A review on functional and pharmacological properties. *Journal of Pharmacognosy and Phytochemistry*. 2019;8(3):4378-82.
- [51] Chandrasekharan C, Bhat S. Potential effects of Mudga (*Vigna radiata* L. Wilczek) as a dietetic food and medication for diabetes. *Journal of Ayurveda and Integrated Medical Sciences*. 2023;8(12):230-35.
- [52] Kathavadiya SH, Acharya R. Yava (*Hordeum vulgare* L.) as a Pathya (wholesome diet): A memoir from classical texts of Ayurveda. *Journal of Drug Research in Ayurvedic Sciences*. 2022;6(3):150-61.
- [53] Garg R, Mangal G, Yadav M, Sharma D. Pathya Aahara Kalpana: A review. *International Journal of Ayurveda*; 2021.
- [54] Sharma MB, Zala U, Patel K, Bhatt C. Pharmaceutical standardization and a brief review of nutritional values of three ayurveda recipes sequentially used after Panchakarma. *Journal of Indian System of Medicine*. 2020;8(4):287-92.
- [55] HV DN, Kanthi M, Rao N. Review on Samsarjana Krama in diseases. *Journal of Ayurveda and Integrated Medical Sciences*. 2023;8(2):141-45.
- [56] Ghodela NK, Mahanta V. Dietary regimen for wound healing- An ayurveda perspective. *Journal of Ayurveda and Integrated Medical Sciences*. 2017;2(01):154-61.
- [57] Boucek RJ. Factors affecting wound healing. *Otolaryngologic Clinics of North America*. 1984;17(2):243-64.
- [58] Acharya Sushruta, Sushruta Sutrasthana, 19th chapter, Shloka no.10, Hindi translated by Dr. Ambika Dutt Shastri. Varanasi: Chaukhambha Sanskrit Sansthan; 2007. Pp.138.
- [59] Gouin JP, Kiecolt-Glaser JK. The impact of psychological stress on wound healing: Methods and mechanisms. *Immunol Allergy Clin North Am*. 2011;31(1):81-93. Doi: 10.1016/j.jiac.2010.09.010. PMID: 21094925; PMCID: PMC3052954.
- [60] Rhee J, Kern B, Cooper J, Freeman RB. Organ donation. In *Seminars in liver disease*. 2009;29(1):019-039. © Thieme Medical Publishers.
- [61] Paradakara Vaidya Harishastri, Ashtanga Hridaya of Vagbhata, Sutrasthana; Roganutpaadaneeyamadhyayam: Chapter 4, Verse 36. Varanasi: Chaukhambha Orientalia, 2011; Pp. 59-60.
- [62] Dubey SD, Singh AN. Basic Concepts of Dravyaguna Vijnana. Varanasi: Chaukhambha Visvabharati. 2014;1:267.
- [63] Bushra R, Aslam N, Khan AY. Food-drug interactions. *Oman Medical Journal*. 2011;26(2):77-83.
- [64] Acharya Sushruta, Sushruta Sutrasthana, 19th chapter, Shloka no. 34, Hindi translated by Dr. Ambika Dutt Shastri. Varanasi: Chaukhambha Sanskrit Sansthan; 2007. Pp.143.

PARTICULARS OF CONTRIBUTORS:

1. Postgraduate Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, DMIHER, Wardha, Maharashtra, India.
2. Associate Professor, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, DMIHER, Wardha, Maharashtra, India.
3. Postgraduate Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, DMIHER, Wardha, Maharashtra, India.
4. Postgraduate Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved College Hospital and Research Centre, DMIHER, Wardha, Maharashtra, India.

NAME, ADDRESS, E-MAIL ID OF THE CORRESPONDING AUTHOR:

Dhruv Modi,
Postgraduate Scholar, Department of Shalyatantra, Mahatma Gandhi Ayurved
College Hospital and Research Centre, DMIHER, Wardha, Maharashtra, India.
E-mail: modidhruv1997@gmail.com

PLAGIARISM CHECKING METHODS: [Jain H et al.]

- Plagiarism X-checker: May 23, 2024
- Manual Googling: Jun 22, 2024
- iThenticate Software: Jul 25, 2024 (7%)

ETYMOLOGY: Author Origin**EMENDATIONS:** 5**AUTHOR DECLARATION:**

- Financial or Other Competing Interests: As declared above
- Was informed consent obtained from the subjects involved in the study? NA
- For any images presented appropriate consent has been obtained from the subjects. NA

Date of Submission: **May 21, 2024**Date of Peer Review: **Jun 23, 2024**Date of Acceptance: **Jul 26, 2024**Date of Publishing: **Oct 01, 2024**