



## Review Article

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### RAKTAMOKSHANA (BLOODLETTING), A MULTI-DIMENSIONAL PREVENTIVE AND CURATIVE APPROACH IN ORAL DISORDERS: A REVIEW

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#### ABSTRACT

Mukha is considered one of the essential parts of urdhvajatru because it reflects the body's health by acting as the gateway of the alimentary canal. Fast food culture, unhealthy habits like smoking and improper oral hygiene have caused irreversible damage to human health, resulting in different oral cavity diseases. In Ayurveda, mukharoga has been elaborately explained with its symptoms and treatment, which can be well co-related to present oral cavity diseases mentioned in contemporary science. In our classics, various treatment modalities have been explained for different oral cavity diseases, from lips to throat. Raktamokshana is the primary line of treatment mentioned for mukharogas, followed by pratisarana, kavala, gandusha, shastra karma and oral medications. Acharya Vagbhata highlights the importance of Raktamokshana in mukha, danta, dantamoola and gala roga. Since all these diseases are kapha-rakta in origin, they require frequent bloodletting. Specifically, in mukharoga, bloodletting as a method is indicated in puti aasya, paaka of oshtha. In these diseases, bloodletting should be done by shringa, jalouka, and alabu or by cutting the sira. There are many kinds of research undertaken to study the action of bloodletting using leeches and have found plenty of beneficial actions like analgesic, anti-inflammatory and antibacterial activity. Overall, Raktamokshana is a very effective line of treatment in most of the mukharogas, curing the disease and preventing further recurrence.

**Keywords:** Mukharoga, Raktamokshana, Pratisarana, Kavala, Gandusha, Shastra karma

#### INTRODUCTION

Mukha is considered one of the most important parts of urdhvajatru because it reflects the body's health by acting as the gateway of the alimentary canal. Fast food culture, unhealthy habits like smoking and improper oral hygiene have caused irreversible damage to human health, resulting in different oral cavity diseases. Our classics explain various treatment modalities for other oral cavity disorders right from oshtha to kantha. Among them, Raktamokshana is the primary line of treatment mentioned for mukharogas, one of the important para-surgical procedures mentioned by Sushruta. The procedure of bloodletting is called Raktamokshana<sup>1</sup>. It is generally classified into two types: shastra visravana and ashastra visravana subdivided into pracchanna, siravyadha, jalouka, sringa and alabu<sup>2,3</sup>. Specifically, in mukharoga, bloodletting as a method is indicated in puti aasya, paaka of oshtha. In these diseases, bloodletting should be done by shringa, jalouka, and alabu or by cutting the sira<sup>4</sup>.

#### REVIEW OF LITERATURE

##### Procedure of Raktamokshana Poorva karma

Siravyadha: The patient is given snehana, swedana, doshapratyaneeka dravya and yavagu. A suitable time is selected for the procedure. The patient is asked to sit in an erect posture and tied with either band of cloth, leather, inner bark of the trees, or a creeper not too firmly nor very loosely to restrain from moving. Then the site where Raktamokshana is to be done is kept

ready. Materials required for the procedure like gauze, cotton, instrument etc. should be arranged priorly<sup>5</sup>.

Jalouka: Non-poisonous Jalouka are collected, and the leeches are placed in the solution of haridra and sarshapa and kept in a water pot for one muhurta<sup>6</sup>.

Pracchana: Above the site of pracchana, a cloth or a band is tied<sup>7</sup>.

Alabu: Alabu should be twelve fingers in length and eighteen in internal breadth. Its mouth should be round, measuring three to four fingers in diameter. Medium-sized ripe fruit is brought, and its inner contents removed by making a wide opening at its top; the empty shell is dried in the sun until it becomes stiff. It is then cleaned well from inside and outside<sup>8</sup>.

Shringa: Shringa measuring three fingers breadth and eighteen fingers length should be selected. The tip of the orifice should permit the entry of mustard. It is appropriately tied and should resemble the shape of a female nipple<sup>8</sup>.

##### Pradhana karma

Jalouka: The patient suffering from the disease, indicated for Jalouka, should be made to either sit or lie down. Jalouka was placed in the water pot after knowing that the leeches were active. Later, the Jalouka is placed over the site by moistening its mouth with drops of water. A small incision is given on the site if it does not bite the location. Once it starts biting and actively sucking the

blood at the area, it should be covered with a moist cloth and retained<sup>6</sup>.

**Siravyadha:** The patient is asked to sit facing east, on a seat of the height of the forearm, flexing his legs at the knees, keeping his elbows on the knees, and clenching the fists. Then a binder is passed above his neck, and the fists, its two ends held by another person standing behind and raising his left hand slightly, are asked to tie a knot not very tight but sufficient to raise the veins. Then the binder is tightened at the back. The patient is asked to fill his mouth with air; this is the method of controlling for puncturing the veins of the head, which are not spreading inwards<sup>9</sup>.

**Alabu:** A small cotton wick dipped in oil is kept straight on the affected area on which some incisions have been made. The wick is lit and produced as a lamp. Immediately the opening of the hollow gourd is placed over it and held tight. The lamp burns for a short time and becomes extinguished by itself, creating a vacuum inside the gourd; fluid (Blood, pus etc.) present locally gets sucked by this vacuum and collects inside it. After some time, the gourd is removed and cleaned<sup>10</sup>.

**Pracchana:** Pracchana should be done excluding the snayu sandhi asthi and marmapradesha. A thin scratch or incision is applied using a sharp blade or instrument. It is usually done from the lower to the upper direction. They may be multiple numbers but should not be done one above the other<sup>7</sup>.

**Shringa:** Small incisions are made over the area affected, and the broader orifice of the horn is placed over the site and held firmly by the hand. Then the physician puts his mouth over the smaller orifice (tip) and begins to suck by force. By this act, the fluids like blood, pus etc., present in the site come out and get collected within the edges of the horn<sup>10</sup>.

**Raktamokshana Pramana (Quantity):** Bloodletting up to one prastha is advised for a patient who is balavan, vayastha and bahudosh<sup>11</sup>. In muscular areas, puncturing should be the size of the yava. In other areas, it shall be half yava or one vrihi using vrihimukha shastra. Veins over the bones should be punctured to the size of half yava using a kutarika<sup>12</sup>. According to Dalhana, blood can be let out in order of one prastha, half prastha and one kudava in uttama, madhyama and adhama matras, respectively. The quantity mentioned above of blood must be removed in two days<sup>11</sup>.

#### **Pashchat Karma**

**Jalouka:** With the appearance of pricking pain and itching at the site of the bite, it is understood that Jalouka is sucking pure blood, implying it can be removed from the site. If it does fall off the site easily, powder of saindhava lavana should be sprinkled over its mouth. Its body should be sprayed with rice flour, and its mouth should be bathed with oil added with salt. The leech is made to vomit the sucked blood completely by holding it in the thumb and index finger of the left hand and applying downward pressure with the thumb and index finger of the right hand. Once it is understood that there is satisfactory vomiting, it should be placed back in the pot filled with fresh water<sup>13</sup>.

The area of the bite should be anointed with shatadoutha ghrita, and a swab dipped in it placed on the site; the wound caused by the leech should be bandaged with the drugs having kashaya, madhura rasa and sheeta veerya<sup>14</sup>.

**Siravyadha-** After good bloodletting, the tourniquet is to be released slowly, the site is washed with cold water, and the site of

the punctured vein is bandaged with a cotton swab soaked in tila taila.<sup>15</sup> By using a tourniquet, the dosha traverse retrograde and affects the blood. So, the patient should adhere to wholesome food and restrict the activities till the dosha return to their abodes<sup>16</sup>.

**Alabu and Shringa:** Once the fluids, like blood, pus etc., get collected inside the horn and the gourd, it is removed, and the site is cleaned.

**Vyadhana Kala (Time of Venepuncture):** During varsha ritu, puncturing should be done on the days that are not cloudy, during greeshma at a cool time and during hemanta at midday<sup>12</sup>.

#### **References of Raktamokshana in Oral disorders as mentioned by various authors**

Various authors have mentioned Raktamokshana as a prime line of treatment in mukharogas. It is depicted in Table 1. Vangasena explains Raktamokshana in different diseases. He has given importance to Raktamokshana with its practical utility and method by mentioning in detail thirty-eight diseases.

#### **Contra-indications:**

Below sixteen years and above seventy years, after bloodletting, asnidha, aswedita and atiswedita, vataroga, after consumption of sneha, after panchakarma therapies, pregnant women and puerperal women, indigestion, internal haemorrhage, dyspnea, cough, diarrhoea, abdominal enlargement, vomiting, anaemia and general anasarca<sup>23</sup>. Baala, vriddha, rooksha, wound, debilitated, one who is sacred, greatly fatigued, who has consumed alcohol, who has undergone vama, virechana and basti, who has gone for a long walk, indulged in sexual activity, ratri jagarana, impotent, emaciated, pregnant, one who is suffering from cough, dyspnea, high fever, paralysis, one who is starving, thirsty, one who is suffering Moorcha<sup>24</sup>. Vagbhata added the following contra-indications other than Sushruta reference like siravyadha should not be performed on the days which are ati sheeta, ati ushna, ati vata, cloudy, na yantritram, tiryak, Na anutthitham except in emergency conditions<sup>25</sup>.

#### **Site of Venepuncture in oral disorders**

Various site in mukharoga for siravyadha is explained by our Acharyas, along with the method of puncturing. It is detailed in Table 2. According to Sushruta, the veins of the tongue should be punctured below the tongue, keeping the tongue up by biting its tip. Veins of the palate and root of the teeth should be punctured, asking the patient to open his mouth very wide.<sup>27</sup>

#### **DISCUSSION**

Most of the mukharoga mentioned in our classics are pitta-rakta and kapha-rakta in origin, and thereby Raktamokshana plays an essential role in managing these disorders. For a better prognosis, shamanushadhi is administered after Raktamokshana.

#### **Role of bloodletting in Dantamoolagata Roga (Periodontal disorders)**

Generally, diseases of the mouth, roots of the teeth (Dantamoola) and throat are predominantly kapha and rakta in origin. So, in these diseases, vitiated blood should be eliminated quickly. Prachhana vidhi can be adopted in dantamoolagata roga, a very effective blood purification therapy in which careful and controlled removal of small quantities of blood is conducted to neutralize the accumulated pitta dosha and many dushtarakta

janya roga. Raktamokshana removes the utpadapadaka karana of dantamoola vyadhi to a great extent. It drains the fluid rich in pathogenic factors from the dantamoola and helps in the easy flow of blood by removing the obstruction in the blocked channels. It stops further aggression of the disease by eliminating pathogenic factors in a faster manner. Once utpadaka karana in the blood is drained, it controls vyanjaka karana's influence by enhancing the local procedure's action, i.e., pratisarana, kavala and gandusha. Based on the above reference, we can assume that rakta visravana helps in a constant stream of neutrophil's emigration from the gingival vessels, the primary and the first line of defence around the teeth. Further, re-establishment of the epithelial barrier takes place. Raktamokshana thereby acts as vranashodhaka and ropaka. In total, Raktamokshana drains the vitiated blood from the site, increases the blood flow, helps to eliminate the toxins, and allows the nutrients. This reduces inflammation and promotes healing. In dentistry, it is adopted as scaling in periodontal disorders. The use of leeches in gum diseases in dentistry minimises abscesses and inflammation.<sup>28</sup>

In cases of chronic generalized Periodontitis, the use of medicinal leeches followed by the application of bio-soluble "Piyavit" gel based on an extract of *H. medicinalis* showed local analgesic and anti-inflammatory effects.<sup>29</sup> Piyavit contains medicinal leech saliva as the primary source of biologically active substances that inhibit platelet-vascular and plasmic haemostasis and provide thrombolysis. The salivary gland secretion obtained from the tropical leech *H. manillensis* was found to have a broad spectrum of antibacterial activity against both Gram-positive (*S. aureus*) and Gram-negative (*Sal. typhi* and *E. coli*) bacterial strains.<sup>30</sup>

Leeches drain the inflammation at the site of an abscess. That explains the role of Raktamokshana in dantapupputa roga. Anti-coagulating agents increase the blood flow in gums, eliminating toxins and increasing nutrition in the affected area. The antibacterial components in leech saliva reduce bacterial growth.<sup>29</sup>

Salivary glands secretion in leeches is known to produce many beneficial enzymes and has been used for many years to treat effectively and promote healing of various diseases, among them, are gum diseases. The anti-coagulation agents in leech saliva also dissolve the blood clots that could develop in the gums. The saliva in leech also contains antibacterial components that assist in reducing bacterial growth. During applied Hirudotherapy, the bacteria are eliminated, and the plaque is removed.<sup>31</sup>

**Raktamokshana in Dantaroga:** In our classics, Raktamokshana is mentioned for krimidanta, which comprises symptoms like blackish discolouration, cavity formation, swelling, pus and severe pain. In dentistry, dental pain can also be a consequence of localized inflammation within the dental pulp. This response is sometimes exacerbated due to the lack of compliance given by the surrounding mineralized tissues, and therefore minor inflammatory changes can result in exaggerated pain perception.<sup>32</sup> There are several known causes responsible for the onset of dental pain, including infection, trauma, dental treatment and chemical injury. These situations share the common factor of either exposing dentin or dental pulp to the environment and/or

generating an inflammatory process within the dental pulp, initiating dentinal hypersensitivity and/or inflammatory pain. Nevertheless, in the clinical setting, the most common source of dental pain is due to dental caries.<sup>32</sup> Therefore, dental caries can trigger dental pain in a two-fold manner: by exposing dentin to the environment with subsequent onset of dentinal hypersensitivity and by generating a localized pulp inflammation in response to bacterial invasion and bacterial molecules (such as bacterial peptides and LPS). Leeches can be used to manage periodontitis, gingivitis, and inflammation of the periosteum as they have anti-inflammatory, immune stimulant, and analgesic effects. Leeches also have antibacterial agents that inhibit bacterial growth in the oral cavity. Hirudotherapy has also been used in root canal treatment.<sup>29</sup> Therefore, when Raktamokshana is adopted in dental caries, it reduces dental pain due to its analgesic and anti-inflammatory action. It also provides the overall benefit of maintaining dental health through its antibacterial activity. Therefore, Raktamokshana is mentioned in our classics for krimidanta as a line of treatment.

**Raktamokshana in Kanthagataroga:** In mukha, dantamoola, and galaroga, Raktamokshana is indicated mainly because of kapha and rakta involvement.<sup>33</sup> For saadhya rohini diseases, Raktamokshana is mentioned as the first line of treatment. Raktamokshana is predominantly shown in pitta, rakta and kaphaja vyadhi or when pitta or kapha is in anubandha to vata dosha. In such conditions of vataprakopa due to kapha and pitta avarana, Raktamokshana can help to remove the avarana of pitta and kapha dosha, giving way for anuloma gati of vitiated vata that indirectly cures the vataja symptoms along with symptoms produced by kapha dosha.<sup>34</sup> Recently, some researchers patented the leech extract from many leech species of the family *Hirudimidae* as an antimicrobial agent with various applications. They argued that the purified extract from any part of the leech body, especially salivary glands, showed antimicrobial activity against many gram-negative/positive pathogens.<sup>35</sup> Most of the kantharogas involve all three doshas and rakta. Thereby when Raktamokshana is done in these disorders, it benefits symptom reduction and dosha shamana.

## CONCLUSION

Raktamokshana is mentioned under pathya in mukharogas. This itself indicates the importance of Raktamokshana in mukharogas. Many pieces of research have been undertaken to study the action of bloodletting using leeches and have found plenty of beneficial actions like analgesic, anti-inflammatory and antibacterial activity. When Doshas are eliminated by bloodletting, the cure rate is maximum. Most importantly, while mentioning avedhya sira, Sushruta includes 16 jihwagata avedhya siras. All these references highlight the importance of Raktamokshana in oral diseases and an in-depth understanding of this mode of treatment by our Acharyas. However, Raktamokshana in oral disorders is less explored and needs much research in this less highlighted area of Shalaky Tantra. Also, various modes of Raktamokshana in different oral cavity diseases need to be studied further, and the best-suited mode has to be adopted as the standard mode of Raktamokshana, in particular mukharoga.

**Table 1: Raktamokshana in Mukharoga as mentioned by various authors**

	Y R <sup>17</sup>	SU. S <sup>18</sup>	A.H <sup>19</sup>	S. S <sup>4</sup>	C.D <sup>20</sup>	B. P <sup>21</sup>	B. R <sup>22</sup>
Pittaja Oshthakopa	+	+	+	+	+	+	+
Kaphaja Oshthakopa	+	+	+	-	+	+	+
Raktaja Oshthakopa	-	+	+	-	+	-	+
Abhigataja Oshthakopa	-	+	+	-	+	-	+
Sheetada	+	+	+	-	+	+	+
Dantapupputa	+	+	-	-	+	+	+
Dantaveshta	+	+	-	-	+	+	+
Soushira	+	+	-	-	+	+	-
Paridara	+	-	-	-	+	+	+
Upakusha	-	-	-	-	+	-	-
Krimidanta	+	+	+	-	+	+	+
Pittaja Jihwa Kanthaka	+	+	+	-	+	+	+
Upajihwa	-	-	+	-	-	-	-
Vataja Rohini (Saadhya)	+	+	-	-	+	+	+
Pittaja Rohini (Saadhya)	+	+	+	-	-	+	-
Kaphaja Rohini (Saadhya)	+	+	-	-	-	-	-
Raktaja Rohini (Saadhya)	+	+	+	-	-	-	-
Kanthashaalooka	+	+	-	-	+	-	+
Ekavrinda	+	+	-	-	+	-	+
Vrinda	+	-	-	-	-	-	-
Gala Vidhradhi	-	-	+	-	-	-	-
Mukhapaaka	-	-	-	-	+	-	+
Pooti aasya	-	-	-	+	-	-	-
Galashundi	-	-	-	-	-	-	-
Vataja Galaganda	-	-	+	-	-	-	-
Medaja Galaganda	-	-	+	-	-	-	-

**Table 2: The site of Siravyadha in Mukharoga**

Disease	Sushruta	Vagbhata
Jihwa-Dantaroga	Jihwa Adhobhaga Sira <sup>9</sup>	-
Taluroga	Talugata Sira <sup>9</sup>	-
Mukharoga	-	Siras near Talu, Oshtha, Hanu, Jihwa <sup>26</sup>
Jathrudhva Granthi	-	Greeva, Karna, Shankha, Shiras <sup>26</sup>

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