RAKTAMOKSHAN- AN ANCIENT AYURVEDIC PARASURGICAL PRACTICE AND ITS APPLICABILITY IN CONTEMPORARY CLINICAL PRACTICE: A REVIEW

Vartika Kashyap1, M. B. Gaur2, Yogesh Kumar Pandey3 and Pooja Sabharwal4

1Post Graduate Scholar, Kriya Sharir Department, Ch. Brahm Prakash Ayurved Charak Sansthan, IPU, Khera Dabar, New Delhi.
2Head of Department, Kriya Sharir Department, Ch. Brahm Prakash Ayurved Charak Sansthan, IPU, Khera Dabar, New Delhi.
3Associate Professor, Kaya Chikitsa Department, Ch. Brahm Prakash Ayurved Charak Sansthan, IPU, Khera Dabar, New Delhi.
4Assistant Professor, Rachna Sharir Department, Ch. Brahm Prakash Ayurved Charak Sansthan, IPU, Khera Dabar, New Delhi.

*Corresponding Author: Dr. Vartika Kashyap
Post Graduate Scholar, Kriya Sharir Department, Ch. Brahm Prakash Ayurved Charak Sansthan, IPU, Khera Dabar, New Delhi.

ABSTRACT
Ayurveda is about ten thousand year old science. There are several surgical and parasurgical procedures mentioned in ancient ayurvedic texts which are applicable today by making few technologic modifications to traditional use of them. One such parasurgical procedure is raktamokshan (bloodletting). Acharya Sushruta, father of Indian surgery, considered raktu (blood) as a fourth dosha (bodily humour necessary to carry out physiological functions) as it is responsible for nourishment of body and our efforts should be towards maintaining it’s health. Vitiation of doshas (bodily humour necessary for life) leads to varying pathologies. Rakta (blood borne) and pitta (bodily humour responsible for metabolism and transformation) diseases that cannot be cured by medication are treated by bloodletting. It is very ancient yet less accredited application of ayurveda. Leech therapy, venesection, cupping therapy which are gaining name today are credited to Acharya Charak, father of medicine. It’s applicability in contemporary clinical practice is well described in ancient ayurvedic texts which are applicable today by making few technologic modifications to traditional use of these procedures by acharyas as well as modern technologic advances applied for their use.

KEYWORDS: Raktamokshan, jalaunka, Siravedha, ghatiyatra, bloodletting.

INTRODUCTION
Acharya Sushrut, father of Indian surgery mentioned several surgical and parasurgical procedures at various contexts. Raktamokshan (bloodletting) being one of them. Dhatus (tissues) are the entities that retain body, mind and prana (life). Rakta is second dhatu formed in sequence. Few acharyas consider rakta as a fourth dosha (physiological humour necessary for life) keeping in mind its significance in sustaining life. According to our ancient literature, the kshaya (depletion) and vridhdi(restoration) of dhatu depend upon rakta. It is the pillar of entire body. Doshadhatuasraya-ashrayayibhava (Mutual Interdependence of dosha and dhatu) accredited to Acharya Vagbhata says that vata resides in asthi(bones), pitta resides in rakta (blood) & sweda (sweat), kapha resides in rest of the dhatu. Rakta is blood (Blood) in untainted or healthy status looks like fiery gold which turns red after putting in fire; Indragopa (red colored insect), red lotus or like AbrusPretorius (Gunja). Rakta is neither very cool nor very warm. It is sweet; unctuous, red in colour, heavy and has a characteristic smell. Rakta is a teja and jalamarhabhatu predominant dhatu. Acharyas dictate maintenance of life processes & supporting the body as the main functions of rakta. To further emphasize the importance of rakta, it is considered one of the pranayatna (seat of life) by acharyas. It means something essential for sustaining life.

Raktavahastrotas play an important role in metabolism of rakta. The principle organs are yakrita (liver) & pleeha(spleen). Patency of strotas (conduits) are obligatory for unrestricted circulation of blood. Any vitiation inbetween leads to strotodushti (aberration in channels) in form of atipraviritii (undue excess formation), sang (obstruction), siragranthi (growth inside conduits) and/or vimarg-gaman (leaving its own channel and entering unusual channel). It leads to varying diseases as summarised in Table 1. The coagulation factors essential for clot formation are...
synthesized in liver. Spleen filters & cleanses blood, creates new blood cells in fetal life and stores platelets which are released in case of severe bleeding. The endothelial layers of blood vessels are considered as raktadharakala. It plays significant role in formation and storage of raktadhatu. The normal endothelium degrades adenosine diphosphate and inhibits platelet aggregation. Injury to endothelium leads to expression of adhesive molecules & procoagulant activities leading to formation of clot.[11]

Raktamokshan (bloodletting) is considered best therapy in blood borne and pitta diseases as pitta has similitude with rakta because of sansargata (close relation between two), pradushanata (vitiated by pitta) and gandhuvarna-anuvidhanata (acquires its odour and colour).[12] Bloodletting can be done by several procedures depending upon the pathology. Siravedha (venesection) is done in deep seated or generalised vitiation of rakta. Shringa (animal horn), alaubha (dried gourd), ghati (bell shaped earthen pot) are applied for numbness or tactile loss. Jalauka (leech) is applied if disease is in subcuteaneous region. If disease is in skin or in form of localised swelling, prachchan (scrapping) is done.[13]

Various procedures of bloodletting are mentioned in ayurveda alongwith indications and contraindications for each. Every procedure has detailed description which can be divided in to pre-, during- and post procedure do’s and don’ts. The need of the hour is to make it accessible to masses by opting modern techniques and parameters.

METHODOLOGY
The present study is conducted after thoroughly undergoing
1. Critical reference of ayurvedic texts especially bhihattrayee in relation to rakta and raktamokshan as a modality.
2. Recent advancements in procedures by which bloodletting can be done.
3. Relevant internet search like ncbi, researchgate, google using keywords Raktamoshan, jalauka, Siravedha, ghatiyantra.
4. Various articles concerned with bloodletting therapy and its applicability in today’s world.

A correlation is made between ayurvedic and contemporary concept of bloodletting. And a compilation of particulars is made in light of modern view of raktamokshan. Role of bloodletting therapy as adjuvant to present line of management of blood borne diseases is appreciated.

DISCUSSION
Three basic physiological entities considered to be pillars of life are vata, pitta and kapha. All have different functions in body. Kaphadosha is responsible for growth and maintenance marking its anabolic or synthetic activity. Pitta dosha is responsible for all type of metabolic activity at the GI tract as well as cellular level. Vatadosha is responsible for movement at muscular as well as nervous system level. Sushruta being the father of surgery gives much importance to rakta. Pure blood is considered as pillar for life. Amount of raktadhatu in body is 8 anjali (the maximum volume one can bear in both hands brought together).[14] Because impure blood can cause diseases it should be removed from body time to time.

Pitta resides as ashrayi (dependent) in rakta (blood) and sweda (sweat).[15] When pitta is vitiated and cannot be treated by pitta alleviating medicines, bloodletting is helpful. It is therapy for both vitiated rakta and pitta as both are acquaintances. Vata and kapha doshas are also responsible for rakta. Properties of vitiated rakta by three doshas are given in Table 2.[16] Bloodlettingremoves impure blood vitiated by imbalanced doshas from the body.

Acharyas classify several methods of bloodletting as Siravedha(venesection), shringa(horn of animal), alaubha(dried gourd or long fruit of cucurbitaceae family), ghati(a medium sized bell like instrument with one end open), prachchan (superficial phlebotomy) as per severity and depth of conditions.

It can be done using sharp or blunt instruments as mentioned in flowchart 1.[17] A. Using sharp instrumens: It includes prachhana and Siravedha
1. Prachhana: literal meaning ‘quick sharp incisions’.
2. Siravedha: directly puncturing a vein with a needle.

B. Using blunt instruments: Shringa (horn of animal), alaubha (dried gourd or long fruit of cucurbitaceae family), ghatiyantra (a medium sized bell like instrument with one end open); all three instruments are used after prachchan(superficial phlebotomy). The principle of action is generation of negative pressure and increase in blood circulation to that localised area. Application of jalauka (Leech therapy) is one of the procedures included under ashastrakrita(without using sharp instruments) raktamokshan.

Certain specified conditions are also mentioned where bloodletting needs to be done.

Indications of bloodletting: Diseases occurring due to vitiation of blood and pitta shall be dealt with bloodletting. These include abscess, pain because of vata, skin diseases, inflammation, filariasis, poisoning, all types of growths/tumors, erysipelas, sexually transmitted diseases, breast diseases, odontitis, uuvulitis.[18] These disorders include vitiated rakta their pathogenesis which is to be removed by bloodletting.

Contraindications of bloodletting: Pregnancy, fasting, generalised oedema, chest injury, severe malnutrition, dehydration, anaemia, acute asthma, immediately after vamana, virechan and basti.[19]
Leech therapy

Ancient perspective of leech therapy: Leech therapy is very ancient yet less accredited concept of Ayurveda. It requires proper selection of patient and leeches, purification, maintenance of leeches in earthen pots as mentioned in ancient texts. Acharya Sushruta has defined two types of leeches- poisonous and non-poisonous with each having six subtypes. Hirudo medicinalis is used most commonly for therapeutic purposes nowadays. Non-poisonous types are used for bloodletting. Application of poisonous leeches causes, oedema, itching, fainting, fever, burning, vomiting and intoxication. He has mentioned use of leech in children, women, elderly, princely and other subtle patients as it is the mildest form of bloodletting.

Technique of Jalauka Application

A. Purva Karma (Pre-Procedure)
1. Proper snehana (oleation) and swedana (sudation) of the patient.
2. Cleansing of Leech by pouring the Leech in water mixed with turmeric powder.
3. Site of application preparation: Cleaning of part of the body to which leech is going to be applied.

B. Pradhana Karma (Chief Procedure): Prick the skin with a sharp and sterile needle before application of leech so that drop of blood comes out and then apply the Leech through. It is to be covered by wet cotton cloth. Apply madhu (honey), ghrit (ghee), or butter if leech is not sucking blood from the site.

C. Paschata Karma (Post Procedure): After sucking sufficient blood, they separate from the area on their own. 3-4 leeches are applied at effected area usually. If the patient feels pricking, itching or discomfort at the site of leech application it means leech has started sucking fresh blood. It is when leech should be removed from the site.

1. Patient care: There is oozing of blood from wound created by the mouth of leech after detachment. It is checked by use of Yastimadhu(Glycyrrhiza glabra) turmeric powder or application of digital pressure or tight bandaging with the cotton cloth.

2. Leech care: Vamana(Stimulation of emesis) of the leech also has to be done so that it can be applied to the same patient for subsequent procedure. Leech is pressed from hind to front end for emesis or turmeric powder is applied over leech’s mouth. After vamana, leech is put in fresh water in clean jar.

One leech usually sucks 5-10 ml of blood. Feeling of lightness in body, alleviation of pain, lessening in severity of the disease and joyful mind are the symptoms of proper vishravan (bloodletting).

According to a study done to establish efficacy of leech therapy in management of osteoarthritis (Sandhivata), it was observed that there is a significant decrease in symptoms including pain, stiffness, and tenderness on application of leech therapy in sandhivata. Recent advances in leech therapy have led some researchers to believe that purified extract obtained from especially salivary glands of leech show an antimicrobial activity against many Gram-negative/positive pathogens. They reported that leech extract had a high antibacterial activity against Shewanella and Aerococcus viridans while a lower activity was observed against Escherichia coli, Salmonella typhi and Staphylococcus aureus. They concluded that leech extract could be used in the treatment of bacteria-induced illnesses including arthritis, foodborne disorders, and nosocomial infection.

Mode of action of leech therapy and its modern day application: Leeches have biologically active compounds in their secretions especially saliva. Recent researches unveil the presence of bioactive peptides and proteins in its saliva. These include antithrombin (hirudin, bufrudin), antiplatelet (calin, saratin), factor Xa inhibitor (lefaxin), antibacterial (theromacin, theromyzin). During feeding on blood, leeches secrete a complex mixture of different biologically and pharmacologically active substances into the wounds. Leeches saliva is rich in antithrombotic agent hirudin. So it is effective in management of cardiovascular diseases which effect heart, veins and arteries. Leech’s saliva has inhibitory action on thrombin. It also increases blood flow to the localised area temporarily. It also has inhibitory action on Xa coagulating factor. Thus it blocks the coagulation cascade and proves to be a fibrinolytic agent.

Microsurgery is carried out under microscope to anastomose small blood vessels, veins and arteries during reconstruction or replantation of tissues or amputated parts. Leech biting of the part induces blood oozing, secretion of bioactive enzymes, anticoagulants and vasodilators thus preventing venous congestion of that part. The duration of leech therapy post-surgery is variable and depends upon the recovery of patient. Besides this, leech saliva is known to have analgesic, anti-diabetic, anti-microbial and antimetastatic activity in favour of which several researches have been conducted.
The application of Siravedha in modern day: Venesection shall be performed by trained ayurvedic physician only as it can have complications if not done suitably. Procedure includes internal and external snehana (oleation) by medicated ghee or oil. After that generalised or localised swedana (sudation) depending upon condition is done. Liquid or light semi-solid diet having rice and water in proportion 1:6 is given to patient before procedure.

For main procedure, a day is selected when weather is favourable neither too hot nor too cold as it may interfere with vasoconstriction or dilatation. The patient is asked to lie down. After selecting the proper vein, area is sterilised by spirit swab, tourniquet is applied so the vein becomes prominent. No. 18 needle or scalp needle is used to puncture the vein and blood is allowed to flow. If venesection is done in proper way the patient will feel generalised or localised lightness, pain will be diminished, symptoms of disease will be minimised and he would feel blissful.

Application of ghatiyantra (cupping) in modern day: Application of cupping can be done by various methods like dry cupping, wet cupping, moving cupping, flash cupping, needle cupping. In dry cupping, only negative pressure is created using air suction pump inside pot so as to raise the area of application. No prick is done over skin. In flash cupping, alcohol dipped cotton or simple matchstick is burnt inside pot/jar which heats the inside of the cup. It is then quickly inverted over area of application. Suction is created and area rises when air cools down. In wet cupping, the area of pain is cleaned with spirit swab. 3-4 skin pricks are given using no. 18 needle or small incisions are made, cup/jar after heating from inside is placed over that area, blood is collected in cups spontaneously. The basic principle of ghatiyantra is increasing the flow of blood in the affected area. This will wash out the accumulated metabolites in that area and pain is relieved. Cupping therapy is accredited to several other ancient sciences whereas the basic principle or mode of its action was mentioned thousands of years ago in ayurvedic classic texts.

Raktamokshan as best treatment modality in certain diseases: Acharya Charak has mentioned certain disorders where raktamokshan has to be done. In vatarakta (gout), bloodletting is indicated using shringa, jalaaukha, suchi, alauba, pracchanand/or siravedha. If vata is aggravated, bloodletting is contraindicated as it causes rakta kshaya. Bloodletting is considered paramount treatment in visarpa (erysipelas) as it can’t occur without vitiation of rakta and pitta. Gula roga (abdominal tumors) that don’t respond to any treatment is curable by bloodletting. In treatment of ummada (psychosis), vishamjwar (fever irregular in onset, symptoms and duration), apasmar (epilepsy), bloodletting is indicated in temporal region or border of hairline.

These are some of the procedures mentioned in thousand years old Ayurveda which can be done for prophylactic as well as therapeutic purposes. Prior to procedure bleeding time and clotting time of patient shall be assessed to exclude any bleeding disorder. Special measures should be kept in mind in case bleeding does not stop. The patient might need rest, proper fluid balance and maintenance of intravenous fluid intervention in such case.

CONCLUSION

Bloodletting is based on an ancient system of medicine in which blood and other bodily fluids were
regarded as humours that had to remain in proper balance to maintain health. Pittadosha and raktdhatu hold similitude with each other. Hence vitiation of one leads to vitiation of other. And when excess toxicity of rakta and pitta has occurred so much so that it cannot be cured by herbs or any other procedure, raktamokshan comes to rescue.

Bloodletting can prove to be highly effective in conditions like hypertension, skin diseases like acne, urticarial, dermatitis, eczema; abscess, boils etc. therapeutic phlebotomy is done in specific conditions like hemochromatosis and polycythemia vera where excess red blood cells are removed out of body. 

Table 1: Types of raktavastrotudushthi and associated diseases.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Type of strotodushthi</th>
<th>Modern correlate</th>
<th>Diseases occurring as a result of strotodushthi</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Atipravritti</td>
<td>Undue excessive action</td>
<td>Kushtha (skin diseases), pidika (Acne Vulgaris), gudpaka (inflamed anal region), medhrapak (inflamed penis), neelika (nevis), vyangata (melanosis), tilakal (non-elevated mole), dadru (tinea corporis), charandamal, shwitra (leprosy), pama (scabies), kotha (urticarial), pleeharoga (spleen disease), kamala (jaundice), vatarakta (gout)</td>
</tr>
<tr>
<td>2.</td>
<td>Sang</td>
<td>Complete or partial obstruction of strotas (conduit)</td>
<td>Kamala (jaundice), rakturnapittha (epistaxis), vatarakta (gout)</td>
</tr>
<tr>
<td>3.</td>
<td>Siragranthi</td>
<td>Growth inside conduits</td>
<td>Kamala (jaundice), raktapurata (epistaxis), vatarakta (gout)</td>
</tr>
<tr>
<td>4.</td>
<td>Vimarg-gaman</td>
<td>Entering some other conduit after leaving its usual conduit</td>
<td>Kamala (jaundice), raktapurata (epistaxis), vatarakta (gout)</td>
</tr>
</tbody>
</table>

Table 2: Properties of raktadushtias a result of three doshas.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Dosha</th>
<th>Properties of raktdushti</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Vata</td>
<td>Frothy, reddish-black, parched and less viscous in appearance, fast flowing and delay in clotting.</td>
</tr>
<tr>
<td>2.</td>
<td>Pitta</td>
<td>Bluish yellow or greenish in color, pungent smelling, flies and ants revolting and takes long to clot.</td>
</tr>
<tr>
<td>3.</td>
<td>Kapha</td>
<td>Red ochre like in color, greasy, cold, more viscous, slimy, sluggish in flow</td>
</tr>
</tbody>
</table>

Table 3: Diseases in relation to site of siravedhan.

<table>
<thead>
<tr>
<th>S. No.</th>
<th>Disease / Condition</th>
<th>Modern correlate</th>
<th>Site of siravedhan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Padadaha, padaharsha, avbahuk, chippa, visarpa, vatashonita, vatakantak, vicharchika, padadari</td>
<td>Burning sensation in soles, tingling in soles, whitlow, erysipelas, gout, ankle sprain, eczema, fissures I sole</td>
<td>2 angula above kshipramartha (present in between big toe and next toe) by using vrihimukhashastras (trochar or thick needle)</td>
</tr>
<tr>
<td>2.</td>
<td>Koshtrishirshaka, khanja, panguta, vatavedana</td>
<td>Inflammation of knee joint, limping, lameness, pain caused by vata</td>
<td>4 angula above gulsamartha (ankle joint)</td>
</tr>
<tr>
<td>3.</td>
<td>Apachi</td>
<td>Swellings, growths in neck (lymphadenopathy)</td>
<td>2 angula below indradastimarma (vital point in centre of calf muscle)</td>
</tr>
<tr>
<td>4.</td>
<td>Gridhrasi</td>
<td>Sciatica</td>
<td>4 angula above or below janumarma (knee joint)</td>
</tr>
<tr>
<td>5.</td>
<td>Galaqanda</td>
<td>Tumour in neck (going)</td>
<td>Urimuda (base of the thigh)</td>
</tr>
<tr>
<td>6.</td>
<td>Pleeharoga</td>
<td>Spleen disorders</td>
<td>Medial aspect of left arm near kurparsandhi (elbow joint) or at junction ring finger and little finger of left hand</td>
</tr>
<tr>
<td>7.</td>
<td>Yakritaroga, kaphodar, kasa, shwasa</td>
<td>Abdominal enlargement because of liver disorders, kaphadosha</td>
<td>Medial aspect of right arm near kurparsandhi (elbow joint)</td>
</tr>
<tr>
<td>8.</td>
<td>Vishvachi</td>
<td>Pain in arms (brachial neuritis)</td>
<td>4 angula above kurparsandhi (elbow joint)</td>
</tr>
<tr>
<td>9.</td>
<td>Shalayuktaprabhika</td>
<td>Painful dysestheny</td>
<td>Shronisasamada (around pelvis)</td>
</tr>
<tr>
<td>10.</td>
<td>Parivartika, updansha, shukadosha, shukaroga</td>
<td>Diseases of penis</td>
<td>Medhra Madhya (middle of penis)</td>
</tr>
<tr>
<td>11.</td>
<td>Muravriddhdi</td>
<td>Hydrocoele</td>
<td>Sides of vrihsa (scrotum)</td>
</tr>
<tr>
<td>12.</td>
<td>Dakodar</td>
<td>Ascites</td>
<td>Left side of raphae 4 angula below umbilicus</td>
</tr>
</tbody>
</table>
13. **Anta-vidraddhi, parshvashula**  
   Internal abscess, pain in flanks  
   Left anterior axillary line

14. **Bahushosha, avbahuk**  
   Wasting of arm, loss of movement of the arm  
   Middle of two scapula

15. **Tritiyakajwar**  
   Tertian fever  
   Middle of trika sandhi (upper back)

16. **Chaturthakjwar**  
   Quarta fever  
   Below scapula on either side

17. **Apasmara**  
   Epilepsy  
   Shankha (temple), keshant sandhi (border of hairline), vaksha (chest), apanga (outer angle of eye), lalaata (forehead)

18. **Unmada**  
   Insanity  
   Shonitvarnaniya

19. **Jihva and dantroga**  
   Diseases of tongue and teeth  
   Below tongue

20. **Taluroga**  
   Diseases of uvula  
   Uvula

21. **Karna roga, karnashula**  
   Ear disorders and ear ache  
   Above and around ear

22. **Timira, akshipaka , netraroga**  
   Partial blindness, ulceration of eye, diseases of eye  
   Near nose, lalaata (forehead), apanga (outer angle of eye)

23. **Shiroroga, adhimantha**  
   Diseases of head, diseases of eye  
   Same as above

---

**Flowchart 1: Types of modalities of raktamokshan.**

**REFERENCES**