

Review Article

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“RAKTAMOKSHANA: CLASSICAL METHODS AND MODERN EVIDENCE FOR THERAPEUTIC BLOODLETTING AND CUPPING”

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ABSTRACT

Background: Raktamokshana, therapeutic bloodletting, is one of the main purification procedures in Ayurvedic surgery. Sushruta regarded blood as a Dosha in surgical practice and described several methods of bloodletting using instruments, leeches, horns and gourds. Bloodletting was later discredited in Western medicine for most indications, but phlebotomy remains standard treatment for some disorders and cupping therapy is widely studied. **Objective:** To review the classical concept and methods of Raktamokshana and the modern evidence for therapeutic phlebotomy, leech therapy and cupping. **Methods:** Narrative review of Sushruta Samhita and of clinical guidelines, randomised trials, systematic reviews and mechanistic studies on phlebotomy, leeches and cupping. **Results:** Sushruta classifies Raktamokshana into Shastra Viravana (Siravyadha and Prachchhana) and Anushastra methods (Jalauka, Shringa, Alabu, Ghati), with detailed indications, contraindications and signs of proper and excessive bloodletting. Modern medicine uses therapeutic phlebotomy as first-line treatment for hereditary haemochromatosis and to maintain haematocrit in polycythaemia vera. A randomised trial in metabolic syndrome found that phlebotomy reduced blood pressure. Leech therapy reduced pain in knee osteoarthritis in a randomised trial and is used in reconstructive surgery. A meta-analysis found that cupping reduced chronic pain compared with no treatment. **Conclusion:** Raktamokshana has modern counterparts with established or emerging evidence. Its use should be limited to indications with reasonable evidence, with careful patient selection, measurement of blood loss and infection control.

KEYWORDS: Raktamokshana; Siravyadha; bloodletting; phlebotomy; cupping; Alabu; Jalaukavacharana; Shalya Tantra

INTRODUCTION

Bloodletting was practised for thousands of years across Greek, Roman, Arabic, Chinese and Indian medicine. In the West, it was used for a wide range of diseases until the nineteenth century, when evidence showed that it was ineffective or harmful for most conditions, and it was largely abandoned^[1]. Nevertheless, therapeutic phlebotomy remains the treatment of choice for iron overload in hereditary haemochromatosis^[2] and for controlling haematocrit in polycythaemia vera^[3]. Leeches are used in reconstructive surgery, and cupping, including wet cupping (Hijama), is widely practised and increasingly researched.

In Ayurveda, Raktamokshana is one of the Panchakarma procedures in the surgical tradition of Sushruta, who considered blood so important that he described it as a fourth Dosha in the context of surgery^[4]. Sushruta wrote that a person who undergoes bloodletting at the right time does not suffer from skin diseases, swellings, tumours and blood disorders^[4].

Methods of Raktamokshana

Table 1: Methods of Raktamokshana

Category	Method	Description	Typical indication
Shastra Visravana (with instruments)	Siravyadha	Venepuncture of a specific vein	Generalised or deep vitiation; specific diseases with designated veins
	Prachchhana	Multiple superficial scarifications	Localised vitiation
Anushastra (without sharp instruments)	Jalauka	Leech application	Pitta-vitiated blood; delicate patients
	Shringa	Suction with cow's horn	Vata-vitiated blood
	Alabu	Suction with gourd	Kapha-vitiated blood
	Ghati	Suction with pot	Kapha and deep-seated conditions

Siravyadha

Sushruta considers Siravyadha so important that he calls it half of all surgical treatment^[4]. In Sharira Sthana 8 he describes the preparation of the patient, the positioning, the application of a tourniquet, the sites of puncture for different diseases and the instruments used. He specifies veins to be punctured for particular conditions, for example near the ankle for foot disorders and in the arm for some disorders of the upper body.

Proper, excessive and inadequate bloodletting

Sushruta describes the signs of proper bloodletting (lightness, reduction of pain and swelling, clarity of

This review summarises the classical concept and methods of Raktamokshana and evaluates modern evidence for its main forms: phlebotomy, leech therapy and cupping.

METHODS

Classical sources were Sushruta Samhita, Sutra Sthana 13 and 14 and Sharira Sthana 8^[4]. Modern literature was identified through PubMed and Google Scholar using phlebotomy, therapeutic bloodletting, leech therapy, cupping, wet cupping, Hijama, Raktamokshana and Siravyadha, with priority to guidelines, randomised trials and systematic reviews. This is a narrative review.

CLASSICAL CONCEPT

Blood in Sushruta's surgery

Sushruta describes blood (Rakta) as the basis of life and as capable of being vitiated by the Doshas, producing many diseases, especially of the skin, joints and surface tissues^[4]. Vitiated blood is recognised by its colour and consistency according to the Dosha involved. Its removal is believed to relieve disease quickly.

senses), the complications of excessive bloodletting (headache, blindness, convulsions, thirst, fainting and even death) and of inadequate bloodletting (persistence of symptoms)^[4]. He specifies that the maximum amount to be removed in one session is one Prastha, an amount usually interpreted as roughly 500 to 650 ml, and that it should be adjusted to the patient's strength.

Contraindications

Bloodletting is contraindicated in generalised oedema, anaemia, pregnancy, emaciation, the very young and old, after other purification procedures, and in conditions like haemorrhoids with bleeding and some

forms of jaundice^[4].

MODERN EVIDENCE

Therapeutic phlebotomy

Hereditary haemochromatosis. Regular phlebotomy is the standard treatment for iron overload in hereditary haemochromatosis. Guidelines recommend weekly removal of about 500 ml of blood until ferritin falls to a target level, followed by maintenance phlebotomy^[2]. Early treatment prevents complications such as cirrhosis, diabetes and cardiomyopathy.

Polycythaemia vera. In a randomised trial in polycythaemia vera, keeping the haematocrit below 45%, mainly by phlebotomy, significantly reduced the rate of cardiovascular death and major thrombotic events compared with a less intensive target of 45% to 50%^[3].

Metabolic syndrome and blood pressure. In a randomised trial in patients with metabolic syndrome, two phlebotomies four weeks apart reduced systolic blood pressure substantially compared with a waiting-list control at six weeks, with improvements in some markers of glucose metabolism and in heart rate^[5]. The authors proposed that reducing body iron stores may improve insulin sensitivity and vascular function. Earlier studies support this idea: bloodletting improved insulin sensitivity in people with type 2 diabetes and high ferritin^[6], and iron depletion by phlebotomy improved insulin resistance in patients with non-alcoholic fatty liver disease and raised ferritin^[7]. This finding is of particular interest because Ayurveda recommends bloodletting for conditions of excess (Santarpana) and vitiated

Summary of evidence

blood.

Leech therapy (Jalaukavacharana)

Leech saliva contains hirudin and other anticoagulant, antiplatelet, anti-inflammatory and vasodilating substances^[8]. In a randomised controlled trial in knee osteoarthritis, a single leech treatment reduced pain more than topical diclofenac in the first week, with benefits on function and stiffness persisting up to three months^[9]. In a prospective study of complicated varicose veins, leech application was followed by healing of all ulcers and reductions in oedema and pigmentation^[10]. Leeches are cleared by regulators for relieving venous congestion in reconstructive surgery^[11].

Cupping (Alabu, Shringa, Ghati)

Classical horn and gourd suction methods correspond to modern dry and wet cupping. A systematic review and meta-analysis of randomised trials in chronic pain found that cupping reduced pain intensity compared with no treatment, while evidence against sham or active comparators was more limited, and the authors noted risk of bias in many trials^[12]. An earlier updated review reported potential benefits of cupping for herpes zoster, acne, facial paralysis and cervical spondylosis, while also noting the low quality of most trials^[13].

Proposed mechanisms of cupping include increased local blood flow, removal of interstitial fluid and inflammatory mediators (in wet cupping), modulation of pain through skin and muscle stimulation, and changes in local immunity^[14]. In wet cupping, small scarifications are made before suction, which is closely analogous to Sushruta's combination of Prachchhana with Shringa or Alabu.

Table 2: Raktamokshana methods, their modern counterparts and evidence

Method	Modern counterpart	Evidence
Siravyadha	Therapeutic phlebotomy	Standard care in haemochromatosis ^[2] and polycythaemia vera ^[3] ; RCT showing reduced blood pressure in metabolic syndrome ^[5]
Jalaukavacharana	Leech therapy	RCT in knee osteoarthritis ^[9] ; uncontrolled study in varicose veins ^[10] ; regulatory clearance in reconstructive surgery ^[11]
Prachchhana with Shringa or Alabu	Wet cupping	Meta-analysis in chronic pain ^[12] ; mechanisms reviewed ^[14]
Shringa, Alabu, Ghati	Dry cupping	Meta-analysis in chronic pain ^[12]

CHOOSING A METHOD IN PRACTICE

Sushruta's choice of method depends on the Dosha involved, the depth and extent of the lesion, and the

patient's strength^[4]. In current Ayurvedic surgical practice, the choice is usually guided by the following considerations.

Table 3: Choosing a method of Raktamokshana in practice

Clinical situation	Usual choice	Reasoning
Localised superficial lesion with Pitta signs (heat, redness, burning), delicate or elderly patient	Jalaukavacharana	Gentle, minimally invasive, slow controlled removal
Localised pain or swelling with Vata or Kapha signs over muscle	Alabu or Shringa (cupping), with or without Prachchhana	Suction draws blood to the surface; scarification allows removal
Generalised condition or deeper vitiation in a strong patient	Siravyadha	Allows measured removal of a larger volume
Skin lesions in small areas (for example, patches or nodules)	Prachchhana	Superficial scarification of the affected area

Practical protocol for Prachchhana and cupping

A typical procedure for wet cupping in the Ayurvedic tradition includes cleaning the skin; applying a suction cup for a few minutes to raise the area; removing the cup; making several superficial parallel scratches with a sterile blade (Prachchhana); reapplying the cup to draw out blood; and finally cleaning and dressing the site. Modern practice uses disposable cups with mechanical or manual suction rather than horns and gourds, and single-use sterile blades or lancets. The volume removed is usually small, often in the range of tens of millilitres, and should be recorded.

Practical protocol for Siravyadha

For Siravyadha, the patient is usually prepared with light oleation and sudation, positioned comfortably, and a tourniquet is applied above the chosen vein. Under aseptic conditions, the vein is punctured with a wide-bore needle (in modern practice, often a standard phlebotomy needle connected to a collection bag) and blood is allowed to flow until the planned volume is reached or signs of adequate bloodletting appear. The tourniquet is released, pressure is applied and the site is dressed. Haemoglobin and blood pressure are checked before and after.

Documentation

For both clinical audit and research, each session should record the indication, method, site, volume removed, duration, pre- and post-procedure haemoglobin and blood pressure, immediate adverse events and outcome at follow-up. Standardised

documentation will allow the outcomes of Raktamokshana to be compared across centres and with modern treatments.

RATIONALE AND CAUTION

The decline of bloodletting in Western medicine was justified: it was applied indiscriminately, often in large volumes, to acutely ill patients, and it caused harm. Sushruta's approach differed in that he emphasised specific indications, contraindications, maximum volumes and signs of excess, which show awareness of the risks. Nonetheless, many classical indications have not been tested with modern methods.

Modern practitioners should therefore distinguish between:

- **Indications with established evidence**, such as phlebotomy in haemochromatosis and polycythaemia vera, which are usually managed by haematologists.
- **Indications with emerging evidence**, such as metabolic syndrome, knee osteoarthritis and chronic pain, where Raktamokshana may be offered with informed consent and monitoring.
- **Traditional indications without modern evidence**, such as many skin diseases, where use should be cautious and preferably within research settings.

SAFETY

Bloodletting carries risks of anaemia, hypotension, fainting, infection and bleeding. Safe practice requires:

- Assessment of haemoglobin, blood pressure and

general condition before each session.

- Exclusion of anaemia, bleeding disorders, anticoagulant use, pregnancy, severe heart disease and frailty.
- Measurement and documentation of the volume removed, with limits adjusted for body weight and haemoglobin.
- Sterile technique, single-use needles and blades, and single-patient leeches.
- Monitoring after the procedure and advice on hydration and diet.
- Infection precautions against *Aeromonas* with leeches.

RESEARCH PRIORITIES

Priorities include: randomised trials of Siravyadha for conditions with plausible mechanisms, such as metabolic syndrome, fatty liver with raised ferritin and selected skin diseases; standardised protocols specifying volume and frequency; trials of Prachchhana and Alabu compared with modern wet cupping and sham procedures in pain conditions; mechanistic studies measuring iron indices, inflammatory markers and blood viscosity; and systematic safety reporting.

DISCUSSION

Raktamokshana occupies a unique place in Ayurvedic surgery. Sushruta's detailed account of methods, indications and safety limits contrasts with the indiscriminate bloodletting of later European medicine. Modern evidence supports some of its forms: phlebotomy for iron overload and erythrocytosis, leech therapy for venous congestion and osteoarthritis pain, and cupping for chronic pain. The randomised trial showing blood pressure reduction after phlebotomy in metabolic syndrome is an intriguing example of a classical principle receiving modern support.

At the same time, many traditional uses lack evidence. Ayurvedic surgeons should apply Raktamokshana selectively, document outcomes and contribute to research that tests its classical indications.

CONCLUSION

Raktamokshana is a classical Ayurvedic purification procedure with modern counterparts that have established or emerging evidence. Phlebotomy, leech therapy and cupping each have defined roles supported by guidelines or trials. Careful selection,

measurement and monitoring, and rigorous research into classical indications, will help integrate Raktamokshana into evidence-based practice.

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