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Herbal Innovations in Wound Healing: A Review on Ashmantak-Based Suture Material

Dr. Priyanka Popat Chavan
M.S. (Shalya Tantra PG Scholar),
Annasaheb Dange Ayurved Medical College,
Ashta, Tal. Walva,
Dist. Sangli (Maharashtra, India)
E-mail: pchavan10698@gmail.com

Dr. Akbar Walandkar
M.S. (Shalyatantra),
Annasaheb Dange Ayurved Medical College, Ashta, Tal. Walva,
Dist. Sangli (Maharashtra, India)
E-mail: akbar.walandkar@gmail.com

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ABSTRACT:

Acharya sushruta has given valuable contribution in field of surgery.introducing with many surgical procedures as well as instruments, surgical condition and its treatment in which herbal suturing material is explained in detail, many drug formation is not yet discovered. Ashmantak is one of suture material which can be used in kshata yrana (incised wound) Use of Ashmantak (Bauhinia Racemosaa Lam.) fibres as a natural suture material represent significant advancement in field of surgery. It will not only enhance the healing process but also minimize adverse reaction. Acharya Sushrut explained Ashtavidh Shashtrakarma in which Seevan Karma (suturing) included, as well as natural suturing material like guduchi pratan, shan, moorva and Ashmantak bark fibres etc explained, in modern science synthetic material is used for suturing such as ethilon, nylon which is not affording for everyone. Using this herbal suture material can be cost effective to a patients which is the main aim of this study

Keywords: *seevan karma, Ashtavidh shastra karma, herbal suture material, sushrut samhita, vrana*

INTRODUCTION:

While considerable research has been conducted on herbal sutures, the specific properties and applications of Ashmantak as a suturing material have not been thoroughly investigated. The unique combination of Ashmantak's tensile strength, herbal properties, and cost-effectiveness presents a significant knowledge gap in the field of wound closure techniques. Traditional herbal materials have shown promise, but a detailed scientific exploration of Ashmantak's properties and its potential as a suturing material is lacking.

Suturing, a fundamental aspect of surgical procedures, involves the use of various materials to ligate blood vessels and approximate tissues. The ancient Indian text, Sushrut Samhita, authored

by Acharya Sushruta around 500 BC, extensively discusses the concept of Seevan karma, meaning suturing. This technique finds its place among Asthavidha shastra karma (the eight branches of surgical procedures) and is described in the context of wound management, notably in Vrana Shashti Upkrama. . Sushruta's detailed accounts include diverse plant and animal- derived suturing materials and emphasize the significance of an ideal suturing material in medical practices.

An ideal suture material should exhibit specific characteristics, including a uniform diameter, adequate tensile strength, non-capillarity, non-allergenicity, non-electrolytic nature, and non-carcinogenicity, as stipulated by scholarly research.25 Additionally, it should be readily available, cost-effective, and easy to handle. However, traditional sutures made from polyamide and synthetic materials can irritate the skin, potentially causing adverse tissue reactions. Recognizing these limitations, the exploration of alternative materials has become imperative in the realm of wound closure.

Literature review:

The word vrana is derived from the word vra-varaonti meaning to cover, to envelope and to protect. This is further suffixed by "ach" in the sense of bhava and "ch" sound is elided and the form remains "vran" +"ach".

The destruction /break/rupture/discontinuity of body tissue part of body are called vrana. In the sutrasthana chapter 21, sushrut has classified that "As the scars of a wound never disappear even after complete healing and its imprint persists lifelong, it (the lesion) is called vrana by the wise." Briefly there are 15 main types of vitiated vran while some acharyas consider 16 types of vran including Shudha vran. Acharya sushruta also explained vrana vasthu, vrana strava, vrana pariksha, vrana gandha, vrana avastha and healing stages.

Seevan karma is indicated in kshataj vrana which is Agantuja Vrana (Traumatic Wound) Sadyo vrana sub devided into various types: , Accrding to Acharya sushrut: 6 sub-types

छिन्नभिन्नंतथाविध्दंक्षतं पिच्चितमेवच। गृ ष्टमाहु स्तथाषष्ठं... सु. वि. २/९

- Chinna.
- Kshata
- Bhinna
- Picchit
- Middhu
- Ghrishta

The term Kshata Vrana comprises of two words Kshataja and Vrana. The literal meaning of these two words is as follows

Kshata:: The literal meaning of the term Kshataja is given as, "**Ksahatatha vranath jayate utpadayte iti"**

It means that the vrana which is produced by kshata is known as kshataja vrana. Kshata vrana

Definition:

The Kshata vrana is defined as the vrana produce by the aghata of external sharp object or instrument resulting into not too Chinna or too Bhinna vrana.

सीवन (Suturing) : पुढील अवस्थांमध्ये सीवनकमर्करावे.

१) अपाकी (Absence of suppuration)

२) नउपद्रव (Uncomplicated)

(३) मांसिस्थत (muscle)

४) विवृत्त (Widely gapping)

Suturing Techniques

The Sushruta Samhita also describes various suturing techniques, each suited to different types of wounds:

- Gophanika: Likened to modern continuous locking sutures.
- Rujagranthi: Comparable to interrupted sutures.
- Vellitaka: Similar to continuous running sutures.
- Tunnasevani: Resembling subcuticular sutures.

These techniques demonstrate the advanced understanding of wound closure in ancient surgical practices

Suture Materials in the Sushruta Samhita: Acharya Sushruta identified several materials suitable for suturing, categorized into natural and absorbable types

- Ashmantak (Bauhinia racemosa. Lam.): A type of bark fiber used for suturing.
- Shana (Corchorus capsularis): Known for its strength and flexibility.
- Atasi (Linum usitatissimum) Flax fibers utilized for their durability.
- Murva (Sansevieria roxburghiana): Fibers from this plant were employed in suturing.
- Guduchi (Tinospora cordifolia): A medicinal plant whose fibers were used for their healing properties.
- Snayu: Animal tendons, noted for their strength.
- Horsehair: Utilized for its resilience.
- Cotton thread: A commonly used material for suturing.

These materials were selected based on their availability, strength, and compatibility with human tissues.

ASHMANTAK

अक्ष्मन्तोको हिमोग्राहीतुबरोश्लेष्मपित्तजित् । कृमिकुष्ठगुदभ्रंशगण्डमालाव्रणापहः। आ नि 23

Ashmantaka (Bauhinia racemosa. Lam.) commonly known as "bedi" leaf tree is a rare medicinal species of flowering shrub with religious significance. It is native to tropical south East Asia.Acharaya dalhan identified that ashmantak has haemostatic property. As well as it has some anti microbial, anti inflammatory properties.

CHEMICAL CONSTITUENTS: Saponins, Flavonoids, Glycosides, Tannis, Methanol.

पयार्य- चन्द्रक, कुद्दाली, अम्लपत्रक, श्लक्ष्णत्वक्, मालुकापणं, यमलपत्रक

PART: Stem, leaf, bark.

- Latin Name - Bauhinia racemose
- Family Name - Fabaceae
- Rasa - Kashaya
- Veerya - Sheeta
- Vipaka - Katu
- Guna -Laghu
- Karma – Tkaphapittahara

Method of preparation



Procedure of Ashmantak suture

1. Fully grown ashmantak barks taken, cleansed with tap water
2. Barks were completely immersed in container with clean water
3. Fibre obtained from fibre extraction method
4. These fibres were rinsed in the fresh water
5. Fibres of equal length obtained by retting peocess held toget twisted/braided firmly to obtain single strand
6. These strand kept for autoclaving after autoclaving tensile strength is observed Challenges and Considerations
    - Standardization: Variability in bark quality can affect suture consistency.
    - Sterilization: Ensuring complete sterilization is crucial to prevent infections.

- Regulatory Approval: May require validation through clinical trials for broader acceptance.

Discussion:

Traumatic injuries have a high prevalence rate, with approximately 60-70% of cases requiring open wound closure. Efficient wound ligation, coupled with hemorrhage control, is paramount. Current synthetic non-absorbable sutures are costly, often exceeding Rs. 300 per suture, rendering them financially inaccessible for many patients. Acharya Sushruta, in his Ashtavidha shashtrakarma, recommended the use of Seevan karma for kshata vran (incised wounds). He specifically mentioned Ashmantak as a non-absorbable suture material, emphasizing its availability and tensile strength. This study aims to evaluate the diameter and tensile properties of Ashmantak, providing valuable insights into its potential application as a costeffective herbal suture material for superficial incised wounds.

Conclusion:

Contemporary research has begun to explore the efficacy of these traditional materials. For instance, studies have shown that Guduchi fibers possess antimicrobial and wound-healing properties, making them comparable to modern synthetic sutures in terms of effectiveness. However, the use of Ashmantak bark as a suture material has not been extensively studied in modern times, indicating a potential area for future research

In summary, the Sushruta Samhita provides a comprehensive guide to suturing materials and techniques, many of which align with or precede modern surgical practices. The exploration of these traditional materials in contemporary research could offer valuable insights into sustainable and biocompatible surgical practices

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