

CONCEPTUAL APPROACH TO AN AYURVEDIC AND MODERN SUTURE MATERIALS

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ABSTRACT

Acharya sushutha is known as father of surgery and father of plastic surgery even till the date. *Acharya sushruta* described about various wound closer techniques along with suture materials, needles even though elaborate suturing procedure and their post wound management. Not only wound management but also various surgeries by using *Astavidha Shastra karma* and *Seevana*(suturing) is one among them. The success of all surgery depends on better wound healing. This will be achieved by suturing. *Acharya Sushruta* described in detail about *Seevana*(suturing) in his time period. Here an attempt is made to throw light on *Sushrutha*'s concept of *Seevana Karma* and modern suturing aspects.

Key Words: *Seevana Karma*, Suturing, Needle, Suturing techniques, Suture materials.

INTRODUCTION: *Acharya Sushrutha* has mentioned different types of surgical procedures under *ASHTAVIDHA SHASHTRA KARMA*¹. They are as follows: *Excision (Chedhana)*, *Incision(Bhedhana)*, *Scraping(Lekhana)*, *Puncturing(Vyadhana)*, *Probing(Eshana)*, *Extraction(EAhara)*, *Draining(Visravan a)*, and *Suturing(Seevana)*^{2,3}. Among these *Seevana Karma* has prime importance in surgery. The success of surgery is based on wound healing nature. Basic purpose of a suture is to join the separated two edges of the wound to attain approximation until healing process provides wound with sufficient strength to withstand need for the mechanical support. In modern, suture material is been classified into synthetic and natural, monofilament and

multifilament, absorbable and non-absorbable⁴. Different kinds of suture material, needles, suturing techniques, and knotting procedure⁵. When we go through Ayurveda the first detailed description on wound, suture material, techniques, and needles, are mentioned in *Sushrutha Samhita*.

Seevana karma

Seevana Karma is nothing but suturing done with the help of *Suchi* is called *Seevana Karma*.

Especially *Acharya Sushrutha* has given detailed description beginning from materials used to suture, indication, contraindication and its different techniques.

Table 1: Indication contra indication of suturing as per Ayurveda

<i>Acharya's</i>	Indication	Contra indications
<i>Sushrutha</i> ⁶	Diseases arising from <i>Meda</i> such as tumor <i>Bhinna vrana</i> (cut wound). <i>Sadyhyovrana</i> (traumatic	Wounds caused by <i>Kshara</i> (alkali) & <i>Agni</i> (fire). Wound contaminated by <i>visha</i> (poison). Wound which having gas inside.

	wound). Diseases localized in movable joints.	Wound that has collected blood with in. Wound having <i>Shayla</i> (foreign body) inside. Presence of <i>Pamshu</i> (stone), <i>Roma</i> (hair), <i>Nakha</i> (nail), and <i>Asti</i> (bone) which are moving inside the wound should be contra indicated for suturing.
<i>Vagbhata</i>⁷	<i>Sadhyovrana</i> (fresh wound), <i>Abhigataj vrana</i> (traumatic wound) <i>Medhaja Granthi</i> (cyst) <i>Hriswa pali</i> (pinna of ear which are thin) Ulcer located at 'Shira' (head), <i>Akshikoota</i> (eye socket), <i>Nasa</i> (nose), <i>Osta</i> (lip), <i>Ganda</i> (neck), <i>Karna</i> (ear), <i>Uru</i> (thigh), <i>Bhahu</i> (shoulder), <i>Greeva</i> (neck), <i>Lalata</i> (palate), <i>Muska</i> (scrotum), <i>Medra</i> (penis), <i>Payu</i> (rectum), and <i>Udara</i> (abdomen). Ulcer present at <i>Gambeereshu</i> <i>Pradesha Mamsa</i> (fleshy part) and <i>Achaleshu</i> (ulcer over the immovable parts) should be sutured.	One should not suture ulcer present over <i>Vankshana</i> (groin), <i>Kaksha</i> (chest), etc. Which are less muscular (<i>Alpa manse</i>). <i>Vayu Nirhasana</i> (Gas gangrene). Presence of <i>Shalya</i> (foreign body) <i>Kshara Visha Agnijan</i> (wound caused by alkali, poison, fire).

***Yogya Suthriya (Training of Suturing)*^{8,9}:**

Acharya Sushruta even explained about how to train a beginner for all surgical procedures.

Among them *Seevana Karma* is practiced with the help of two ends of fine thick cloth and smooth muscle.

***Seevana Dravya (Suture material)*¹⁰**

Table 2: Acharya Sushruta told Seevana Dravya (suture material) follows

	<i>Seevana Dravya</i> (suture material)	Images
1	<i>Sukshma Sutra</i> (minute thread)	

2	<i>Ashmantaka Valka</i> (fibre of <i>Bauhinia Recemosa</i>)	
3	<i>Kshouma Sutra</i> (linen)	
4	<i>Shana</i> (thread derived from the <i>Corchorus Capsularis</i>)	
5	<i>Snayu</i> (ligament or tendon)	
6	<i>Bala</i> (hairs)	
7	<i>Guduchi</i> (fibre of <i>Tinospora Cardifolia</i>)	
8	<i>Murva</i> (fibre of <i>Marsdenia tenacissima</i>)	

Seevana Dravya(suture material) of *Acharya Sushruta* in *Ayurveda* according to *Yukti* can be divided in to

1. Animal origin and plant origin
2. Absorbable and non absorbable

Table 3: Animal and Plant origin *Seevana Dravya*¹¹

Plant origin	Animal origin
<ol style="list-style-type: none"> 1. <i>Sukshma Sutra</i> 2. <i>Ashmantaka Valka</i> 3. <i>Kshouma Sutra</i> 4. <i>Shana</i> 5. <i>Guduchi</i> 6. <i>Murva</i> 	<ol style="list-style-type: none"> 1. <i>Snayu</i> 2. <i>Bala</i>

Table 4: absorbable and non absorbable *Seevana Dravya*¹¹

Absorbable <i>Seevana Dravya</i>	Non absorbable <i>Seevana Dravya</i>
<ol style="list-style-type: none"> 1. <i>Snayu</i> 	<ol style="list-style-type: none"> 1. <i>Sukshma Sutra</i> 2. <i>Ashmantaka Valka</i> 3. <i>Kshouma Sutra</i> 4. <i>Shana</i> 5. <i>Guduchi</i> 6. <i>Murva</i> 7. <i>Bala</i>

Some other suture material according to modern science¹²

It is divided into

1. Absorbable suture material
2. Non absorbable suture material

Absorbable suture material: These are made up of material which are broken down in tissue after a given period of time.

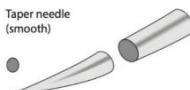
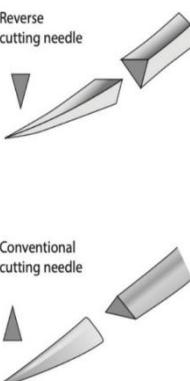
Non absorbable suture material: these are made up of materials which are not metabolized by the body and are removed after a few weeks.

Table 5: Different types of suture materials¹²

	Absorbable	Non absorbable
Natural	Catgut Fascia lata Kangaroo tendon Beef tendon	Silk Cotton Linen
Synthetic	Polyglactin 910 (vicryl) Polyglycolic acid (PGA)(Dexon) Polydioxanone (PDS)	Poly amide Polyester Polypropylene Polybutester (Novafil)
Metallic		Stain less steal Tantalum Platinum Silver wire

Table 6: Suchi(needle) according to *Acharya Sushruta*⁶

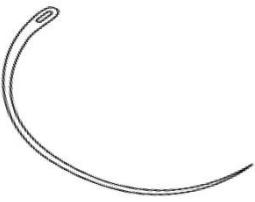
Shapes	Measuremen t	Use	Compariso n with modern	Images

VRITTA SUCHI	2 Angula	Alpa mamsa and Sandi Sthita	Round body needle	 <div style="border: 1px solid black; padding: 5px; display: inline-block;">Round body needle</div>
TRAYASTRA SUCHI	3 Angula	Mamsala Pradesha	Cutting body needle	
DHANURVAKRA	-----	Marma, Phalakosha, and Udara	Curved needle	

Needles according to modern science^{13,14}

Needles are classified into different types on the basis of following

Table 7 : classification of suture material

S.L	Types	Subtypes	
1	According to the eye:	Eye less needle(atraumatic)	
		Needle with eye(traumatic)	
2	According to shape	Straight needle	

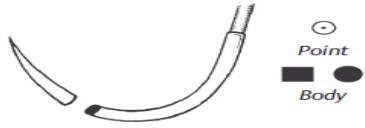
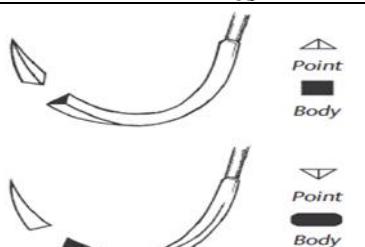
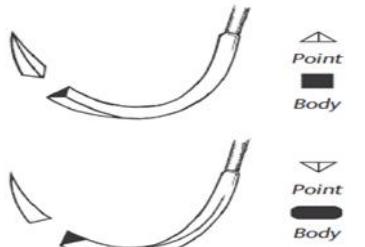
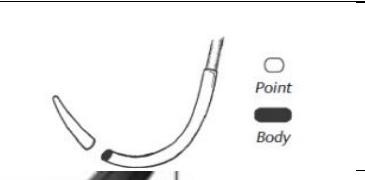
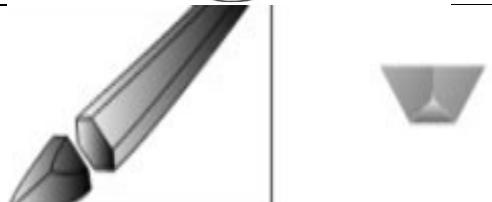
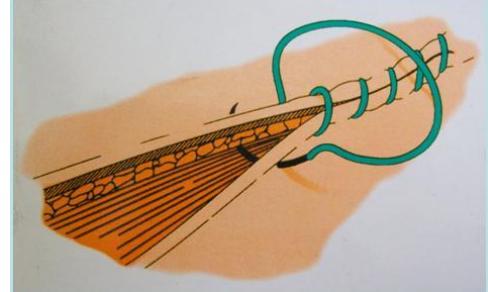
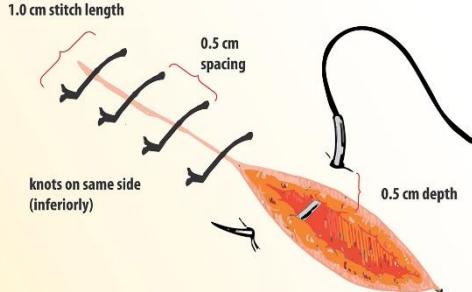
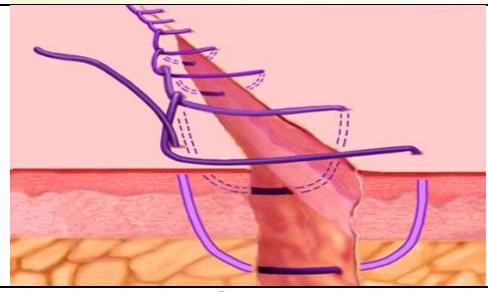
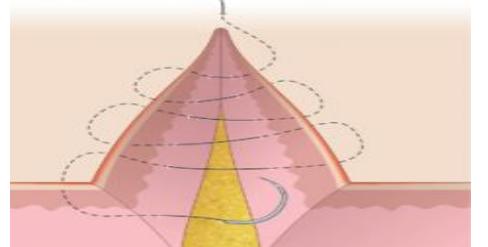
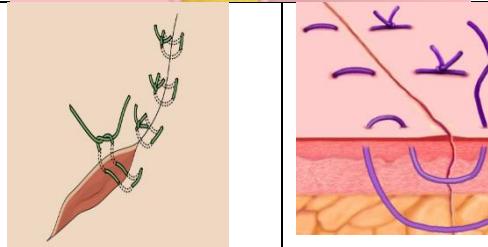
		Curved needle	
3	According to cutting edge	Round body needle	
		Cutting body needle	
4	According to its tip	Triangular tipped needle	
		Round tipped needle	
		Blunt point needle	
	Others	Spatula needle	
		Micro point needle	

Table 8: Methods of suturing¹⁵

S.L.	Ayurveda(Acharya Sushruta)	Modern	Images
1	<i>Vellitaka</i>	Continues suture	
2	<i>Rujugranti</i>	Interrupted suture	
3	<i>Gopanika</i>	Blanket suture	
4	<i>Thunnasevani</i>	Buried or Subcuticular suture	
5	Not said	Mattress suture	

DISCUSSION: Acharya Sushruta was very well versed in wound management, he has explained many surgical procedures, *Astavida Shastra Karma*, *Shasti Upakrama* etc, for wound

management hence he was also named as “*Vrana Kovida*¹⁶”

Acharya Sushruta explained *Astavida Shastra Karma* starting *Chedana* and ends with *Seevana*^{2,3}.

Seevana is having important role in closing wound and to bring back normal skin again. *Acharya Sushruta* explained different types of suture material such as *Kshouma, Bala, Murva, Guduchi & Snayu*⁶. These are of both plant as well as animal origin¹¹. These suture material are both absorbable & non-absorbable¹¹. It shows that *Acharya Sushruta* had idea about absorbable as well as non-absorbable suture material.

Not only *Sushruta Samhita* but also all *Brihatrayi* gives information about suturing.

In depth *Acharya Sushruta* has mentioned different techniques like *Rujugrathi, Tunnasevani, Vellitaka & Gopanika*⁶. These can be correlated with modern suture techniques which are being practiced nowadays.

Surgical needle of *Acharya Sushruta* like *Vritra, Trayasta, and Dhanurvakra*¹⁰ can be correlated with round body, cutting body, curved body respectively. Even *Acharya Sushruta* mentioned adhesive type of suturing by *Pupilika* in *Parisravi udara*¹⁷.

CONCLUSION:

Usually a list of reason are enumerated for declinment of *Shalyatantra* like lack of anesthesia, suture material etc. *Acharya Sushrutha* is the first Indian surgeon described abundantly about various suture materials and techniques in several year back itself. If we use those ancient methods of suture materials to our practice with modifying them similar to modern science, we can surely uplift our science. So, Here this article is made attempt to show similarities of suture materials of ancient and modern system.

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