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Suture Material in Ancient Ayurveda and Modern Science

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ABSTRACT: -

Acharya Sushruta father of ancient surgery has described *Ashtvidh Shastra Karma* (8 surgical procedures) in *Sushruta Samhita* they are as follows *Chedana* (Excision), *Bhedna* (Incision), *Lekhana* (Scraping), *Vedhan* (Puncturing), *Eshan* (Probing), *Visravan* (Evacuating), *Seevan* (Suturing), *Aharay* (Extraction). Among *Ashtvidh Shastra Karma*, *Seevan Karma* (Suturing) is primarily important. *Acharyas* described *Seevan Dravyas* which are required for *Seevan Karma* i.e. *Seevan Sutra* and *Seevan Suchi*. For the purpose of proper wound healing good surgical practice should be applied and for proper suturing one should practice it with ideal techniques. It gives better result for wound healing. Basics of suturing which he described years back are still followed. *Ayurvedic acharyas* was very well known to the methods of suturing and its importance in practice and described well in various classical literature of *Ayurveda*. In modern day surgical practices, we all follow the same principle without change. Surgical suture is a medical device used to hold body tissues together after an injury or surgery. Suturing is the closing technique of surgical as well as the traumatic wound and also final step of every surgical procedure. Sutures are used by your doctor to close wounds to your skin or other tissues.

Keyword- *Seevan Karma, Ashtvidh Shastra Karma, Suture, Suchi.*



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INTRODUCTION

In *Ayurveda*, *Acharyas* mentioned *Ashtvidh Shastra Karma* (8 surgical procedures). *Shastra Karma* is the system or treatment done utilizing sharp instrument. *Seevan Karma* (Suturing) is *Pradhana Karma* (main procedures), its indication; contraindication and procedure are mentioned in *Samhitas* which is relevant present day also. *Seevan Karma* (Suturing) is important for early wound healing and avoiding scar formation. Our *Acharyas* gave references about *Seevan Karma* (Suturing)

1. *Acharya Shushruta* talks about *Seevan Karma* in *Sutrasthan*, chapter- 5th "*Agropharniya Adhya*" and chapter-25th "*Ashtvidhshastrakarmiya Adhyay*".
2. *Acharya Charaka* mentioned in chapter- 25th "*Dwivarniya Adhyay*" of *Chikitsa-sthan*.
3. *Acharya Vagbhatt* in *Ashtang Sangrah* chapter-38 "*Shastrakarmavidhi Adhyay*".
4. In *Bhel Samhita Chikitsa-sthan* chapter -27 "*Vranachikitsa Adhyay*".

Acharya Sushruta has given detailed description about *Seevan Karma* (Suturing) likewise its indication, contra-indication, type, site of suturing, suturing material, and *suchi* etc. *Acharya Sushruta* also told about applying these techniques in surgical practice in chapter-9 of *Sutra-sthan*, *Yogyasutriya Adhyay*. In this chapter *Acharya Sushruta* has advised how to rehearse *Ashtvidh Shastra Karma* on various objects. *Acharya* has told *Seevan Karma* (Suturing) on the piece of cloth or leather. The main work of suturing is to keep the edges of wound connected and to heal that wound quickly.

This whole procedure is performed with the help of *suchi* (needle) is called *Seevan Karma* (Suturing).

Indication¹

Seevan karma or suturing is done in Medojanay Rog (diseases due to excessive fat), *Bhinna Varna* (incision), *Sadyovarna*. In Wounds which are not contaminated with bacteria, wound over movable joints etc. are also treated with suturing.

Contra-Indication²

Wounds which are caused by *Kshar* (alkaline), *Agni* (cauterization), *Visha* (poison), *Antar-Lohit Shalya* and *Gangrene*, *Panshu*, *Rom* (hair loop), *Nakh* (nails) are contraindications for *seevan karma*. If broken and movable piece of bones present in wound then it is not closed with suturing. *Acharya* explain about reason behind this stated that these all-causes pus in that wound and give rise of many kind of pain in that wound.

Type of *Seevan*³-

1. **Vellitaka**-It means continuous suture. This is accomplished by stitching constantly along the length of the wound rapping the twisted edges inside it.
2. **Gophanika**- The vrana which are molded as footprints of crow or are wide, they are suturing with *gophanika* kind of suturing.
3. **Tunnasevani**- It is done as like as the destroyed pieces of clothing are suturing. It is fitting in *vrana* over the eyelids.

4. ***Rujugranthi***- In this needle is embedded in *vrana* edges and sutured, keeping some distance between two join.

Seevan Dravyas

1. *Seevan Sutra*
2. *Seevan Suchi*

1-Seevan Sutra⁴ - The material used for *Seevan karma* (Suturing) with needle is called *seevan sutra*. *Acharyas* gave a wide variety of *dravyas* (drugs) which can be used as *seevan sutra*. The *seevan Sutra* are as follows: *Ashmantak Twak, Shan, Kshom (Atsee) (Linum usitatissimum), Snayu, Baal, Murva (Marsdenia tenacissima*

Wight & ARn) and *Guduchi (Tinospora cordifolia)* etc. *Acharya sushruta* has also told *Seevan Karma* in abdominal perforation with a very unique and practical approach. In abdominal wound closure, he used large black ants which bite the wound edges together and the ant's body is then twisted off leaving the head in place. This leads to closure of the perforation wound.

1. Seevan Suchi

Suchi means needle. *Acharyas* used different type of needle for different sites of wound. *Sushruta* has given three types of *suchi*⁵

Table 1 Showing three types of such by Sushruta

Shape	Measurement	Use
<i>Vrit Suchi</i>	2 Angula Praman	Alp Mans And Sandhi Sithit
<i>Ayat/ Tridhara Suchi</i>	3 Angula Praman	Mansal Pradesh
<i>Dhanuvakra Suchi</i>	-----	Marm, Phalkosh, Udar

***Acharya Vagbhata* has also given three types of *Suchi*⁶**

Shape	Measurement	Use
<i>Vrit Suchi</i>	2 Angul Praman	Alp Mans And Sandhi Sithit
<i>Tridhara Suchi</i>	3 Angul Praman	Mansal Pradesh
<i>Dhanuvakra Suchi (Brihimukh)</i>	2.5 Angul Pramaan	Pkwashay, Amashay Marm

Quality of *Suchi*⁷

While explaining about detail of *suchi* (needle), *acharyas* also mentioned about quality of *suchi*. *Acharyas* mentioned that the tip of *suchi* should be *Tikshna* (sharp) and body must be round like *Malati Pushp Vranta*. Sharp needle is easy to insert in the area and also causes less pain.

Principal of *Seevan Karma*⁸

Acharya mentioned to not to do not do *Seevan Karma* (Suturing) too far or too close. Performing far reaching *Seevan Karma* (Suturing) can cause pain in the margin of the wound and by doing more close suturing the margin of wound get cut.

Procedure of *Seevan Karma*

Seevan Karma is in one of the *Ashtvidh Shastra Karma*. *Acharyas* explained it by dividing it into *Poorva Karma, Pradhan Karma and Paschat Karma*.

1. Poorva Karma (Pre operative procedures)⁹

If wound is contaminated with *Pamshu* (small stones), *Roma* (hairs), *Nakha* (nails) should be removed. After *Samyak Vishodana* (proper cleaning) of *Vrana*, wound edges are raised. *Poorva karma* is mainly cleaning of wound to prevent contamination.

2. **Pradhan Karma (Main operative procedures)**¹⁰ - After *samyak shodhan* of wound the main procedure of *Seevan Karma* is done with *Suchi* and *Seevan Dravyas*. In this step the *vrana* is evenly stitched according to its need.
3. **Paschat Karma (Post operative procedures)**¹¹ - Apply medicated *Khsom Pichu* after *Seevan Karma*. Then dusting of fine powder of *Priyangu* (*Callicarpa macrophylla Vahl*), *Anjan*, *Yashtimadhu* (*Glycyrrhiza glabra Linn*), *Lodhra* (*Symplocos racemosa Roxb.*), *Shallaki Phal* (*Boswellia serrata*) on the wound and then bandaging of the wound. After proper suturing, the wound is then applied with drugs which prevent the wound from contamination and also accelerates healing of wound.

Modern view of *seevan karma*- Sutures

The act or method of joining together the two edges of a wound or incision by stitching or similar means any material as gut, thread, wire, etc., so used is called suturing. A single loop or knot of such material made in suturing. Surgical suture is a medical device used to hold body tissues together after an injury or surgery.¹² Suturing is the closing technique of surgical as well as the traumatic wound and also final step of every surgical procedure. Suture materials is an artificial fibers used to keep wound together until they hold themselves by natural which is synthesized & oven into a stronger scar.

Classification of Suture Materials

There are two type of suture material according to source and structure.

According to source they are further divide into three type

1. Natural
2. Synthetic
3. Metallic

According to the structure

1. Multifilament
2. Monofilament

According to source

1. Natural

Absorbable	Non-Absorbable
Catgut	Silk
Chromic catgut	Linen
Collagen	Cotton
Beef tendon	Ramie

2. Synthetic

Absorbable	Non-absorbable
Poly glycolic acid	Nylone(polyamide)
Poly glactic acid	Polypropylene
Vicryl	Polyester
Polydioxnone	Polyethylene

3. Metallic

SS (stainless steel)
Tantalum
Silver
Gold
Aluminum

According to the structure

1. Multifilament

Absorbable	Non-Absorbable
Vicryl	Silk
Poly-gylcolic acid	Cotton
	Linen

2. Monofilament

Absorbable	Non-absorbable
Vicryl	Polypropylene
Catgut	Polyester
Chromic catgut	Nylone

Difference between suture materials

Monofilament	Multifilament
Has no capillary action	Has capillary reaction
Less infection risk	More prone to infection
Smooth tissue passage	Less smooth passage
Higher tensile strength	Less tensile strength
	Better knot security

Absorbable	Non-Absorbable
Degraded by enzymes, hydrolysis or phagocytosis	Encapsulated or walled by fibrosis
Used to hold the wound edges in approximation temporarily until the is heal	Used to suture at site when tensile strength need to be maintained.

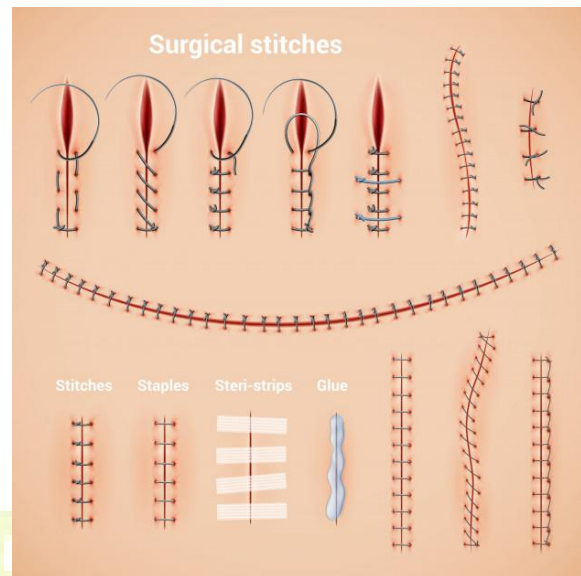
Quality of Suture

- a) It should have uniform diameter.
- b) It should provide knots which hold security without slip or cutting/ Good tensile strength.
- c) Easy to handle
- d) Tissue biocompatibility/minimum tissue reaction
- e) Easy to sterile
- f) Low capillarity
- g) Non-allergic, non-electrolytic, non-carcinogenic
- h) Cost effective
- i) It should be readily visualized, should not shrink & should not be extruded from the wound.
- j) On break down, it should not release toxic agents.
- k) It should disappear without excessive reaction once its task is completed.
- l) Selection of suture material
- m)
- n) Healing characteristics of the tissues which are to be approximated
- o) The physical and biological properties of the suture materials
- p) The condition of the wound to be closed
- q) The probable post-operative course of the patient

Suture Needle

Eyed or reusable needles with holes (called eyes), which are supplied separate from their suture thread, are often used for suture. The suture must be threaded on site, as is done when sewing in a recreational setting. Surgical needles are designed to steer suture material through tissue with minimal injury.

There are several shapes of surgical needles. These include-



- Straight
- 1/4 circle
- 3/8 circle
- 1/2 circle. Subtypes of this needle shape include, from larger to smaller size, CT, CT-1, CT-2 and CT-3¹³.
- 5/8 circle
- compound curve
- half curved (also known as ski)
- half curved at both ends of a straight segment (also known as canoe)

Needles can be -

- Straight (GIT) or Curved
- Swaged or Eyed
- Made up of either SS or Carbon Steel.

Needle is selected according to

- Type of tissue to be sutured
- Tissue's accessibility
- Diameter of suture material.
- Made up of either SS or carbon steel

Classification of Surgical Needles

1. According to eye
 - a) Eye less needles

- b) Needles with eye
2. According to shape
 - a) straight needles
 - b) curved needles
3. According to cutting edge
 - a) round body
 - b) cutting
 - c) conventional
 - d) reverse cutting
4. According to its tip
 - a) triangular tip
 - b) round tip
 - c) blunt tip
5. Others
 - a) spatula needles
 - b) micro point needles
 - c) cuticular needles
 - d) plastic needles

Ideal Properties of Needles

- a) High quality stainless steel
- b) Smallest diameter possible
- c) Capable of implanting sutures with minimal trauma to tissues
- d) Stable in the needle holder
- e) Should be sharp
- f) Sterile and corrosion resistant.

DISCUSSION

Wound healing is a important topic for both contemporary and *Ayurveda* science. Proper wound healing depends upon various factor and one of the most important factors is *seevan* or suturing. There is detailed description present in *Ayurveda* for *seevan karma*. Among major eight procedures of wound healing, *seevan karma* (*Suturing*) is primarily important. Division of *seevan karma* in *poorva*, *pradhan* and *paschat karma* declares the wide thinking of *ancient acharyas*. *Shodhan* of wound and removal of foreign material from wound is important to prevent puss formation in wound (*poorva karma*). Knowledge of different types of *seevan*

sutra and different size and shape of needle is also important to do proper *seevan karma* according to the site of wound (*pradhan karma*) and application of medications after the suturing is important to early healing and pain relieving (*paschat karma*). All these knowledge is valid till now and nearly same description is present in modern medicine with some advancements.

CONCLUSION

Ideal suturing technique gives better result for wound healing. Very detailed description is present in both the systems with common target of proper wound healing. *Ancient acharyas* described the procedure and steps so accurate which are practical till now but modern advancements are also important to achieve the goal.

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REFERENCE

1. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25*, verse16. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-456
2. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25*, verse17. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-456
3. Astanga samghraha, part 1st edited by kaviraj atridev gupta, chowkhamba krishnadas academy, Varanasi, reprint 2005, 38/38.
4. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay;*

- Chapter 25, verse21. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-478*
5. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse24. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-456*
 6. Astanga samghraha, part 1st edited by kaviraj atridev gupta, chowkhamba krishnadas academy, Varanasi, reprint 2005, 38/30.
 7. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse25. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-455*
 8. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse26. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-457*
 9. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse18-19. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-453*
 10. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse20-22. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-460*
 11. Shastri AD, editor, (1st Ed.). Vol-1, Sushruta Samhita of Sushruta, sutra sthan *Ashtvidhshastrakarmiya Adhyay; Chapter 25, verse27-28. Varanasi: Chaukhambha Sanskrit Sansthan, Reprint 2017.pp-478*
 12. Sharma, D. D. deepak, Rahul, D., Rathore, D. A., & Sharma, D. N. (2020). Dhupana With Nimbapatra As A Adjuvant Therapy To Manage Vrana- A Review. *International Research Journal of Ayurveda & Yoga*, 3(6), 95-100.
 13. https://en.wikipedia.org/wiki/Surgical_suture.

