



**ANCIENT SURGICAL TECHNIQUES AND PROCEDURES RELATED TO ENT  
(SHALAKYA TANTRA) MENTIONED IN SUSHRUTA SAMHITA**

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**ABSTRACT**

In this article, we have discussed surgical procedures and techniques used in ENT mentioned by *Acharya Sushruta* in his renowned work, *Sushruta Samhita*. *Acharya Sushruta*, the pioneer of *Sushruta Samhita*, is known as 'Father of Surgery' and 'Father of Plastic Surgery'. In *Sushruta Samhita* (~600 BC), detailed explanations of surgical instruments (*yantras*), different types of incisions, different suturing and bandaging techniques (*bandha*), fracture reductions, techniques of foreign body extraction etc. are found. He has also mentioned reconstruction (*Sandhana*) surgeries, which were in use among *Vaidyas* even during the colonial rule.

**KEYWORDS:** Surgical procedures, *Yantras*, *Bandha*, *Sandhana*.

**INTRODUCTION**

*Ayurveda*, a science of life is the oldest treasure of medical science where many diseases have been described in detail with prognosis, internal medications and surgical interventions which is gradually adopted and explored by western medicine with the aid of advanced technology.

Surgery is an integral part of *Ayurvedic* treatment as far as ENT is concerned. A detailed and systematic account of surgical interventions in the form of pre-operative, operative and post operative care along with the management of complications following surgery has been described in our ancient *Ayurvedic* texts. *Sushruta Samhita* is the most reliable and authentic *Ayurvedic* literature available for the treatment of diseases of *Shalaky Tantra*. It has the compilation of most authentic and advanced surgical techniques of that time. He has mentioned various minor as well as major procedures like reconstruction surgeries in the context of management of ENT disorders at the time when there were limited diagnostic aids available. Many *Acharyas* preceding *Acharya Sushruta* followed the same surgical techniques. Even, western world followed *Acharya Sushruta's* surgical knowledge, explored it and come up with advanced surgeries of today. And hence, *Acharya Sushruta* is rightly given the title of 'Father of Surgery' in modern surgery also.

**AIMS AND OBJECTIVES**

To explore the different surgical techniques and procedures related to ENT, mentioned in *Sushruta Samhita* and to compile them.

**Different Surgical techniques and procedures mentioned in *Sushruta Samhita***

• **Incisions**

In places such as the brows, cheeks, temples, forehead, lip etc., incision should be *Tiryaka* ie. horizontal. (*Su.Su.5/13*)<sup>[1]</sup>

• **Yantras**

*Yantras* are mentioned in this chapter with their indications. (*Su.Su.7*)

1. *Svastika yantras* are useful for *Asthi Vidashata shalyoddharnartha* ie. extracting the foreign bodies lodged in the bones. (*Su.Su.7/10*)<sup>[2]</sup>
2. *Tala yantras* are useful for *Karna nasa nadi shalyanama aharnarthama* ie. removing foreign bodies from the ear, nose and sinuses. (*Su.Su.7/12*)<sup>[3]</sup>
3. *Nadi yantras* are useful for *Srotogatashalyoddharnarthama* ie. extracting foreign bodies from the srotasa (channels, minute pores etc.), *Rogadarshanama* ie. to observe the

abnormalities inside, *Achooshnarthama* ie. for sucking vitiated fluids like blood, pus etc. (Su.Su.7/13)<sup>[4]</sup>

4. *Shalaka yantras* are useful for *Srotogatashalyoddharnarthama* ie. Extraction of foreign bodies, *Nasaarbudaharnarthama* ie. Used for extracting polyps or tumours inside the nose etc. (Su.Su.7/14)<sup>[5]</sup>

### Reconstructive Surgeries

- 15 techniques of **Karna bandha (Otoplasty)** are mentioned in this verse. (Su.Su.16/10)<sup>[6]</sup>
1. **Nemisandhanaka:** It is done when both the parts of the cut ear are thick, broad and even.
  2. **Utpala bhedaka:** It is to be done when both the parts are round, broad and even.
  3. **Valluraka:** It is done when both the parts are small, round and even.
  4. **Asangima:** It is done when internal part only is long.
  5. **Gandakarna:** It is done when the external part only is long.
  6. **Aharya:** It is done when there is very small lobe or absence of lobe on both side.
  7. **Nirvedhima:** It is to be done when the ear is well fixed at both side and the ear lobe is thin and adhering loosely.
  8. **Vyayojima:** It is done when the ear lobe is thick or thin, regular or irregular.
  9. **Kapatasandhika:** It is done when the internal lobe is long and other lobe is short.
  10. **Ardhakapata sandhika:** It is done when the external lobe only is long and other part of the lobe is short.

Also, *Sankshipta*, *Hinakarna*, *Vallikarna*, *Yastikarna* and *Kakaushataka* types of *Karnasandhana* are *Asadhya*.

- ❖ In this verse, *Acharya* has mentioned that when the *karnapali* (pinna) of both the ears are not present, then it should be repaired by cutting the skin at the back of ears. (Su.Su.16/11)<sup>[7]</sup>
- ❖ When the *karnapali* (pinna) is damaged greatly, joining should be done medially, whereas when the damage is great medially then joining should be done posteriorly. (Su.Su.16/12)<sup>[8]</sup>
- ❖ When the pinna only is present and is big, thick and static, then it should be cut into two and joined. (Su.Su.16/13)<sup>[9]</sup>
- ❖ Cutting out a flap of the living muscles from the cheek retaining its connection intact, turning over to the site of the lobe after scrapping the area, thus making up the lobe. (Su.Su.16/14)<sup>[10]</sup>

- **Nasa Sandhana (Rhinoplasty)** is mentioned in this verse. (Su.Su.16/46-50)<sup>[11]</sup>

**Procedure:** A leaf of a tree should be taken and cut to the shape and size of the nose, this is placed on the cheek, then the cheek muscle is cut to the same size; raising a flap of it and maintaining the connection with the live muscles, the flap is placed quickly on the mutilated nose after scrapping it, then suitable bandage tied, inserting two tubes into the nose, one to each nostril, then powder of medicinal plants should be sprinkled on the site and white cotton swab placed on it, *tila taila* should be sprinkled frequently.

After the union has healed, the flap of muscles should be cut at its half length allowing the remaining intact. If the nose is short, attempt should be made to augment its growth and if there is excess growth, it should be made even, to the normal size by cutting or scrapping.

- **Oshthasandhana (Oroplasty)** is mentioned here. (Su.Su.16/51)<sup>[12]</sup>

Joining of the mutilated lips should be done in the same way as joining of the mutilated nose but without the insertion of tubes.

### Types of Bandages

Types of *Bandha* (Bandaging) are mentioned in this verse. (Su.Su.18/18)<sup>[13]</sup>

1. **Svastika bandha (like plus mark or cross):** It is used in between the (bhru) brows and karna (ears).
2. **Pratoli (broad):** for *griva* (neck).
3. **Khatva bandha (Four tailed bandage):** for *hanu* (lower jaw), *shankha* (temples) and *ganda* (cheeks).
4. **Vitana bandha (tent like):** for *murdhani* (scalp).
5. **Gophana bandha (like horns of cow or T bandage):** for *chibuka* (chin), *nasa* (nose) and *oshtha* (lips).
6. **Panchangi bandha (five tailed):** for parts or organs above the shoulder (*Urdhavajatrana*).

Other types of bandaging- (Su.Su.18/24)<sup>[14]</sup>

1. **Gaadha bandha (Tight bandaging):** on head.
2. **Sama bandha (Moderate bandaging):** on face, ears and throat.
3. **Shithila bandha (Loose bandaging):** on the joints.

- **Classification of diseases according to Surgical techniques**

In this chapter, *Ashtavidha Shastra karma* (Eight surgical procedures) are described. (Su.Su.25)

1. **Chhedya roga** (diseases requiring excision): *Shleshmika granthi*, *Mamsa sanghata* (benign

tumour of palate), *Galashundika* (enlargement of uvula), *Adhrusha* (swelling in palate). (*Su.Su.25/3-4*)<sup>[15]</sup>

- Bhedya roga** (diseases requiring incision): All abscesses (*Vidradhi*) except that produced by all the *doshas* together, *Vataj*, *Pittaj* and *kaphaj* tumours (*granthi*), two kinds of *Vrinda* (small tumours of throat), *Talupuppata* (tumours of the palate), *Tundikeri* (tonsillitis), *Gilayu* (Tonsillar abscess), *Kshudra roga* like *Khalitya*, *Palitya* etc. (*Su.Su.25/5-8*)<sup>[16]</sup>
- Lekhya roga** (diseases requiring scrapping): *Vataj*, *Pittaj*, *Kaphaj* and *Raktaj Rohini*, *Uppjihvika* (swelling of tongue), *Adhijihvika* (Adenoids or epiglottitis) etc. (*Su.Su.25/9*)<sup>[17]</sup>
- Vedhya roga** (diseases requiring puncturing): Vitiated veins (*Sira*). (*Su.Su.25/10*)<sup>[18]</sup>
- Eshya roga** (diseases requiring probing): *Sashalya vrana* (wound with foreign body inside), *Unmargi vrana* (sinus ulcer which spreads sideways). (*Su.Su.25/10*)<sup>[19]</sup>
- Aharya roga** (diseases requiring extraction): *Karnamala* (ear wax), three types of *sharkara* (salivary calculus), *shalya* (all kinds of foreign bodies). (*Su.Su.25/11*)<sup>[20]</sup>
- Sravya roga** (diseases requiring drainage): All kinds of *Vidradhi* (abscess) except *Tridoshaj Vidradhi*, *Ekadeshiya shotha* (inflammatory oedema confined to one place), *Palyamaya* (diseases of the earlobe), all kinds of *arbuda* (malignant tumours), three kinds of *granthi* (benign tumours), *Galashaluka* (epiglottitis), *Jihvakantaka* (inflammation of tongue), *Talukantaka* (inflammation of palate), *Kshudra rogas* including *Khalitya*, *Palitya*, *Darunaka* etc. (*Su.Su.25/12-15*)<sup>[21]</sup>
- Sivya roga** (diseases requiring suturing): *Medasamuttha roga* (tumours etc. arising from fats), *Sadyovrana* (traumatic wounds), *Chalasanthyapashrita vrana* (diseases localized on movable joints requiring suturing). (*Su.Su.25/16*)<sup>[22]</sup>

- **Types of suture materials**

*Sukshma sutra* (fine thread) of bark of *Ashmantaka*, flax, jute, linen, (*Snayu*) ligament, hair, fibre of *murva* or *guduchi*. (*Su.Su.25/20-21*)<sup>[23]</sup>

- **Types of sutures:** (*Su.Su.25/22*)<sup>[24]</sup>

- Vellitaka
- Gophanika
- Tunnasevani
- Rijugranthi etc.

- **Types of needles:** (*Su.Su.25/23-24*)<sup>[25]</sup>

- Vritta Anguldvayama** (Round and around 4cm long)- for body parts which have *Alpa mamsa* (less muscles) and for (Sandhi) joints.
- Ayata trayangula trayasra** (three edges and around 6cm long)- for body parts which have more muscle mass ie. *Mamsala*.
- Dhanurvakra** (curved like bow)- It is ideal for *Marma pradesha* (Vital points).

- **Methods of foreign body extraction**

This chapter contains knowledge regarding removal of foreign bodies, hence the name- *Shalyapanayaniya*. (*Su.Su.27*)

- Foreign bodies of eyes and other body parts come out naturally by- acts of flow of tears (*Ashru*), sneezing (*Kshavathu*), belching (*Udgara*), coughing (*Kasa*) etc.
- Mamsaavgadha shalya avidahyamanama* ie. Foreign body stuck up inside the muscles and not causing burning sensation – should be made to come out along with pus and blood by creating suppuration, if it is not coming out then it should be torn out or hit with appliances (*Pachana*, *Bhedana*, *Darana* and *Peedana*).
- Indriya shalya* ie. Minute foreign bodies lodged in sense organs- should be removed by *Parishechana* (pouring water), *Adhamapana* (blowing air), *Parimarjana* (sweeping with hands, cloth or hair).
- Aharashesha shleshma,anu shalya* ie. Foreign bodies such as food particles, mucus and minute- should be removed by inducing *shwasana* (breathing), *Kasana* (coughing), *pradhamana* (blowing air).
- Annashalya* ie. Particles of food- these may be removed by inducing vomiting by inserting fingers etc. into the mouth.
- Vrana dosha* (pus) present in the cavity of wound should be removed by washing with liquid. (*Su.Su.27/5*)<sup>[26]</sup>
- Sirasnayu vilagnama shalya* ie. Foreign bodies stuck up in veins and ligament- should be removed by *Shalaka* (metal rods) etc. (*Su.Su.27/12*)<sup>[27]</sup>
- Shvayathugrasta* ie. Foreign bodies lodged in oedema- should be removed by squeezing.
- Asthivivara pravishtha shalya* ie. Foreign body inside the cavity of bones- then the physician should hold the patient by the legs and pull out the arrow using a blunt instrument or the patient should be held by

strong persons, the shaft of the arrow should be bent with the help of an instrument, and then fastened with five tailed bandage to the string of a bow at one end and reins of the horse at the other end, then the horse should be whipped so that it lifts its head suddenly with force, resulting in pulling the arrow out; or a strong branch of a tree bent down and the arrow pulled out as before. (Su.Su.27/14)<sup>[28]</sup>

10. *Jatushe kanthasakte* ie. Foreign body made of shell lac in the throat- when a foreign body made of shell lac is found stuck up in throat, then a hollow tube should be introduced first and a heated metal rod inserted through it till it touches the foreign body. When the foreign body adheres to the heated rod, it should be bathed with cold water, and after it becomes stable, it should be pulled out. (Su.Su.27/17)<sup>[29]</sup>
11. *Ajatusha shalya* – Foreign body which is not made of shell lac should be pulled out by using a rod smeared with lac or bees wax in the same manner as described earlier. (Su.Su.27/18)<sup>[30]</sup>
12. *Asthishalya tiryaka kanthasakta* ie. Bony foreign body, if found stuck up in the throat horizontally, then the patient is made to swallow a ball of hair, fastened to a strong and lengthy thread, along with liquid food, followed by consuming more liquid food, till his stomach becomes full, then he is made to vomit. During vomiting, after determining that the foreign body has stuck to the ball of hair, the thread should be pulled out suddenly or a soft tooth brush made from twigs of plants may be used. If by these acts, if it does not come out, then it should be deep inside. (Su.Su.27/19)<sup>[31]</sup>
13. *Graasashalya kanthasakte* ie. Food bolus stuck in the throat as a foreign body- then the person should be made to bend and given hard hit with the fist over his neck without his knowledge or he may be made to drink oil or ghee, wine or water thus making it to enter the stomach. (Su.Su.27/21)<sup>[32]</sup>

- **Sites of venupuncture in different diseases**

*Vyadhana sthana* (place of puncturing) is mentioned here in this verse. (Su.Sha.8/17)<sup>[33]</sup>

1. In *Galaganda* (tumour in the neck)- vein present in *uroomoola* (base/root of the thigh) should be punctured.

2. In *Jihvaroga* (diseases of tongue)- *Siravedhana* (puncturing) should be done on *adhohihva* (base of tongue).
3. In *Taluroga* (diseases of palate)- *Siravedhana* (puncturing) should be done in *talv* (palate).
4. In *Karnapeeda* and *Karnaroga* (otalgia and ear diseases)- *Siravedhana* should be done around the ears (*karnyopari samantata*).
5. In loss of smell perception and the diseases of nose (*Gandhagrahana* & *Nasaroga*)- It should be done at the *Nasagra* (tip of the nose).
6. In *Shiroroga* (diseases of the head)- veins of the same place should be punctured.

- **Management of fractures and dislocations**

In this chapter, named, *Bhagna Chikitsa*, treatment of different types of *bhagna* (fractures) and *chyuti* (dislocations) is given. (Su.Chi.3)

1. **Akshakasthi chyuti (dislocation of clavicle):** The area should be given fomentation and then lifted up using a wooden pestle or pushed down if bulging up and then tight bandage applied. (Su.Chi.3/36)<sup>[34]</sup>
2. **Grivavivriti (twisting of the neck):** When neck is found twisted or sunk into the chest, then the physician should hold the head at the *avatu* (nape of the neck) and *hanu* (lower jaw) and pull the neck upward, apply splints suitably and then bandage it with bands of cloth; the patient is instructed to sleep keeping his face up for seven days, without any laxity. (Su.Chi.3/37-38)<sup>[35]</sup>
3. **Hanusandhi chyuti (dislocation of lower jaw):** The physician should anoint the area, give fomentation and place the lower jaw in its normal place (by physical manipulation), then apply *Panchangi bandha* (five tailed bandage); instilling drops of oil processed with *Vata mitigating and sweet drugs into the nose is greatly beneficial*. (Su.Chi.3/39-40)<sup>[36]</sup>
4. **Nasabhanga (fracture of nose):** When nose is found sunk inside or distorted, it should be made straight with the help of an iron rod, hollow tubes having opening at both ends are introduced into the nostrils (one to each nostril) anointed with ghee, bandaged and then bathed with ghee. (Su.Chi.3/43-44)<sup>[37]</sup>
5. **Karnabhanga(fracture of ear):** When the ear is fractured, it should be placed in its normal position, bathed with ghee, bandaged with cloth soaked in ghee; after that it is treated like a fresh wound. (Su.Chi.3/45)<sup>[38]</sup>
6. **Sira kapala bhagna (fracture of skull bones):** When the *kapala asthi* (flat bones of the skull)are found fractured without *mastulunga* (brain matter)

coming out, then the area should be bathed with mixture of honey and ghee and bandaged; the patient instructed to drink ghee (medicated) only as food for seven days. (*Su.Chi.3/46*)<sup>[39]</sup>

- **Management of different diseases**

- ❖ **Indralupta Chikitsa (Alopecia areata)**- The (*Siramokshana*) vein of the scalp should be punctured after anointing and fomentation; then the skin should be incised and paste of medicines should be applied. (*Su.Chi.20/24-25*)<sup>[40]</sup>
- ❖ **Arunshika Chikitsa** - The blood should be let out and the lesions should be washed with decoction. (*Su.Chi.20/27*)<sup>[41]</sup>
- ❖ **Darunaka Chikitsa** - scalp should be anointed and fomented first and then the vein should be punctured. (*Su.Chi.20/29-30*)<sup>[42]</sup>
- ❖ **Mukhroga Chikitsa** or treatment of diseases of the mouth is given in this chapter. (*Su.Chi.22*)
- **Pittaj, Raktaj and Abhigataj Oshtha roga** (swelling of the lips) can be treated by blood letting. (*Su.Chi.22/6*)<sup>[43]</sup>
- In **kaphaj oshtha roga**, Blood letting should be done. (*Su.Chi.22/7*)<sup>[44]</sup>
- In **medoj oshtha roga**, after doing fomentation, incision should be made by sharp instrument, cleared and then cauterization done. (*Su.Chi.22/9*)<sup>[45]</sup>
- In **pittaj and kaphaj Jihvakantaka** (inflammation of tongue), blood letting should be done. (*Su.Chi.22/45-46*)<sup>[46]</sup>
- In **Upjihva** (swelling of tongue), tongue should be scrapped (*Lekhana karma*). (*Su.Chi.22/48*)<sup>[47]</sup>
- **Galashundika** (enlargement of uvula), should be pulled using a forceps held by the thumb and finger and then cut with *mandalagra shastra*; that resting on the tongue, should be cut to one-third of its length; pulling too much causes bleeding & ultimately death of the patient; by inadequate cutting there will be swelling, more of salivation etc. (*Su.Chi.22/49-50*)<sup>[48]</sup>
- In **Tundikeri** (tonsillitis), **Adhrusha** (swelling in palate), **Kurma, Talu sanghata** (benign tumour of palate) and **Talupuppata** (tumour of palate), *Shastra karma (Surgical treatment) should be done.* (*Su.Chi.22/57-58*)<sup>[49]</sup>
- In **Vataj, Pittaj, Kaphaj and Raktaj Rohini**, blood letting should be done. (*Su.Chi.22/59-63*)<sup>[50]</sup>
- **Adhijihvika** (adenoids or epiglottitis) should be treated like upjihvika ie. *lekhana karma (Scraping) should be done.* (*Su.Chi.22/65*)<sup>[51]</sup>

- In **Ekavrinda** (small tumour of throat), blood letting should be done. (*Su.Chi.22/66*)<sup>[52]</sup>

In **Gilayu** (tonsillar abscess), *Shastra karma* or surgical intervention is required.

In **Amarmastha Galavidradhi** (abscess in non vital spots), when well ripe should be excised just like other abscesses.

- ❖ In **karnapali** (earlobe) treatment, *Asrigamokshana* (blood letting) should be done. (*Su.Chi.25/13*)<sup>[53]</sup>
- ❖ **Karnakita (insects, wax or fluids present in ear)**- These are removed by using either a *Shringa* (horn) or *Shalaka* (rod like instrument). (*Su.U.21/58-59*)<sup>[54]</sup>
- ❖ **Nasapaka Chikitsa**- Blood letting should be done. (*Su.U.23/5-6*)<sup>[55]</sup>
- ❖ **Anantavata Chikitsa**- *Siravyadha* (Venupuncture) should be done. (*Su.U.26/36-37*)<sup>[56]</sup>
- ❖ **Shiroroga chikitsa**- If by all the treatments mentioned in context of *shiroroga*, the disease does not subside, then the physician should administer *Siramokshana* (Venupuncture). (*Su.U.26/43*)<sup>[57]</sup>

## DISCUSSION

- *Acharya* has mentioned various surgical techniques including their pre-operative, operative procedures and post operative care along with their complications and management.
- According to modern science, incisions on the face should correspond to the creases or wrinkle lines<sup>[58]</sup> and this fact has similarity with what is mentioned in *Sushruta Samhita*.
- Various *yantras* mentioned in *Sushruta Samhita* have similarity with the instruments of modern science like *Svastika yantra* can be compared to forceps like Crocodile forceps<sup>[59]</sup>, tilley's forceps<sup>[60]</sup>, hartman's forceps<sup>[61]</sup> etc.

*Tala yantra* (with discs or scoops) can be compared to Wullstein cupped forceps<sup>[62]</sup>, Blakeslay forceps<sup>[63]</sup>, Rosen curved microcurette<sup>[64]</sup> etc.

*Nadi yantra* (with one opening or openings at both ends) can be compared to Ear speculum, Otoloscope, Endoscopes, Endoscopic suction tips etc.

*Shalaka yantras* (rod like instruments or probes) are similar to Jobson's horne probe<sup>[65]</sup>, Bowman lacrimal probe<sup>[66]</sup> etc.

- Different types of surgical procedures like *Lekhana* (Scraping), *Chhedana* (Excision), *Bhedana*

(Incision), *Vyadhana* (Puncturing), *Seevya* (Suturing) etc. are being used till now.

- Reconstruction surgeries of present day like Otoplasty which also involves using skin grafts<sup>[67]</sup> etc, Rhinoplasty or nasal reconstruction (skin graft from cheek is used to repair columella or nasal ala)<sup>[68]</sup> etc., are the similar little modified versions of the surgeries mentioned in *Sushruta Samhita*.

- Different bandaging techniques mentioned in *Sushruta Samhita* has similarity with present day techniques like: *Svastika Bandha*- Cross bandage.

*Khatva bandha*<sup>[69]</sup> – Four tailed bandage of jaw, side of the temple bandage.

*Vitana bandha*<sup>[70]</sup>- Recurrent bandage of head with two bandages or Cap bandage.

*Gophana bandha*- Nasal sling bandage.

- Suture techniques given by Acharya Sushruta are also being used till today, like<sup>[71]</sup>

*Vellitaka*- Continuous suture.

*Gophanika seevana*- Blanket suture.

*Tunnasevani*- Subcuticular suture.

*Rijugranthi*- Interrupted suture.

- (*Suchi*) Surgical needles used at that time can also be compared to the present day needles like:

*Vritta Anguldvayama* – Straight needle (Round).

*Ayata trayangula trayasra*- Straight needle (Three edged).

*Dhanurvakra* – Curved needle.

- Many of the methods of foreign body extraction mentioned by *Acharya* are almost similar to the one's which are being practised today.
- Treatment of various fractures and dislocations related to ENT has been mentioned by *Acharya Sushruta*.
- Method of removal of insects, wax, fluids etc. with rod like instruments described in *Sushruta Samhita* is similar as done in modern science with jobson's horne probe or cerumen hook etc.<sup>[72]</sup>

## CONCLUSION

- *Acharya* has mentioned a detailed account of surgical interventions related to ENT, which are practical and authentic to a great extent.
- Many classical surgical techniques can be used as it is even these days.
- These interventions can be of great help in discovering new and advanced techniques with the help of recent advancements.

## REFERENCES

1. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition

2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 5, verse13, Pg31.

2. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 7, verse10, Pg47.

3. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 7, verse12, Pg48.

4. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 7, verse13, Pg48.

5. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 7, verse14, Pg49.

6. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse10, Pg113.

7. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse11, Pg114.

8. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse12, Pg114.

9. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse13, Pg114.

10. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse14, Pg115.

11. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse46-50, Pg120.

12. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 16, verse51, Pg121.

13. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 18, verse18, Pg131.

14. Prof. K.R. Srikantha Murthy, *Sushruta Samhita of Sushruta*, English Commentary, Reprint Edition

- 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 18, verse24, Pg133.
15. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse3-4, Pg182.
16. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse5-8, Pg182.
17. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse9, Pg183.
18. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse10, Pg183.
19. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse10, Pg183.
20. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse11, Pg183.
21. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse12-15, Pg184.
22. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse16, Pg184.
23. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse20-21, Pg185.
24. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse22, Pg185.
25. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 25, verse23-24, Pg185.
26. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27 , verse5, Pg198.
27. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27, verse12, Pg200.
28. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27, verse14, Pg200.
29. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27, verse17, Pg201.
30. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27, verse18, Pg201.
31. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter27, verse19, Pg202.
32. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sutra Sthana, Chapter 27, verse21, Pg202.
33. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2014, Chaukhamba Orientalia, Sharir Sthana, Chapter8, verse17, Pg135.
34. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse36, Pg50.
35. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse37-38, Pg50.
36. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse39-40, Pg50.
37. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse43-44, Pg51.
38. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse45, Pg51.
39. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter3, verse46, Pg51.
40. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition

- 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter20, verse24-25, Pg195.
41. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter20, verse27, Pg195.
  42. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter20, verse29-30, Pg196.
  43. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse6, Pg204.
  44. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse7, Pg204.
  45. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse9, Pg204.
  46. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse45-46, Pg210.
  47. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse48, Pg210.
  48. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse49-50, Pg210.
  49. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse57-58, Pg211.
  50. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse59-63, Pg212.
  51. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse65, Pg212.
  52. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter22, verse66, Pg212.
  53. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2016, Chaukhamba Orientalia, Chikitsa Sthana, Chapter25, verse13, Pg244.
  54. Uttar Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2012, Chaukhamba Orientalia, Uttar Tantra, Chapter21, verse58-59, Pg118.
  55. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2012, Chaukhamba Orientalia, Uttar Tantra, Chapter23, verse5, Pg123.
  56. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2012, Chaukhamba Orientalia, Uttar Tantra, Chapter26, verse36-37, Pg142.
  57. Prof. K.R. Srikantha Murthy, Sushruta Samhita of Sushruta, English Commentary, Reprint Edition 2012, Chaukhamba Orientalia, Uttar Tantra, Chapter26, verse43, Pg142.
  58. www.thieme.com.
  59. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 54.
  60. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 4.
  61. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 3.
  62. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 54.
  63. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 96.
  64. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 58.
  65. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg1.
  66. Atlas of Instruments in Otolaryngology, Head and Neck Surgery by Vikram Bhat K and Manjunath D, Jaypee Publishers, First edition, Pg 118.
  67. Logan Turner's Diseases of the nose, throat & ear, Head and Neck Surgery, Edited by S. Musheer Hussain, Eleventh Edition, Chapter11, Pg 98-99.
  68. Logan Turner's Diseases of the nose, throat & ear, Head and Neck Surgery, Edited by S. Musheer Hussain, Eleventh Edition, Chapter11, Pg 96-97.
  69. Bandaging and Splinting, Department of the Army Field Manual, June 1957.Pg43.

70. Bandaging and Splinting, Department of the Army Field Manual, June 1957.Pg22.
71. [www.medicine.net.com](http://www.medicine.net.com).
72. Diseases of Ear, Nose and Throat & Head and Neck Surgery by PL Dhingra and Shruti Dhingra, 6<sup>th</sup> Edition, Chapter 8, Pg53.