



Review Article

A COMPREHENSIVE REVIEW OF SURGICAL INSTRUMENTS (YANTRAS & SHASTRAS) USED IN STREE ROGA & PRASUTI TANTRA IN AYURVEDA VIS-À-VIS MODERN OBSTETRICS & GYNECOLOGY

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ABSTRACT

Wide description is available in Ayurvedic classics regarding various surgical instruments (*Yantra*, *Shashtra*) used in different branches of *Ayurveda* for carrying out clinical examination; medical and operative procedures. *Hasta* (Hand) is considered as the *Pradhantamam yantra* because surgical instruments are in many ways simply extension of human hand. Surgical instruments such as forceps, dilators, speculums, needles, lancets etc are similar to the 101 *Yantras* and 20 *Shastras* mentioned in *Ayurveda* e.g., *Samdansha Yantra*, *Naadi Yantra*, *Shalaka Yantra*, *Mandalagra Shashtra*, *Vetasapatra Shashtra*, *Suchi*, *Shararimukha Shashtra* etc. To perform various procedures in *Stree Roga* and *Prasuti Tantra*, use of blunt and sharp instruments are described in detail. Most of the modern surgical instruments are only slight modifications of the instruments used by ancient Hindu surgeons. In this article we have discussed about those *Yantras* (Blunt instruments) and *Shastras* (Sharp instruments) which are mentioned in *Stree Roga* and *Prasuti Tantra* and their counterparts in modern Obstetrics and Gynecology.

INTRODUCTION

Stree Roga and *Prasuti Tantra* was highly developed branch of *Ayurveda*. Various surgical instruments and surgical procedures are described in detail in various *Samhitas*. According to James Vincent Ricci "There can be little doubt that the old Greek and Roman surgical instruments preserved in the museum of Naples are replicas of Hindu instruments found accurately described in Hindu surgical books more than two thousand years old. *Kaviraj Gananath Sen* has demonstrated from old texts that most of the modern surgical instruments are only slight modifications of the instruments used daily by the ancient Hindu physicians; such as modern 'Lion forceps' (*Sinhamukha Yantra*) and Vaginal Speculum, as described by Indian Physician *Vagbhatta*".

Bhagvat Sinhjee, in his History of Aryan Medical Science, states that the dimensions of these instruments were given in detail by the writers who at the same time recommended that new implements and instruments be introduced in accordance with the exigencies of the time and with the advice of experienced and competent surgeons.^[1]

In this review article, we have discussed about those *Yantras* (Blunt instruments) and *Shastras* (Sharp instruments) which are mentioned in *Stree Roga* and *Prasuti Tantra* and their counterparts in modern Obstetrics and Gynecology.

Materials and Methods: For the present conceptual study Ayurvedic literature, Modern literature and internet are the source.

Literary Review

Hasta (Hand)

Among all the *Yantras*, *Hasta* is considered as the *Pradhantamamyanttra*^[2] because; surgical instruments are in many ways, simply extension of human hand.

Ayurvedic classics have described use of *Hasta* to correct various gynecological conditions specifically that of *Sthanapavrit* (displaced) yoni. For example:

Nisrit yoni (yoni protruding outside) should be inserted by gently pressing with hand.

Jihma (tortuous or bent) *Yoni* should be straightened by bending it downwards or upwards with hand.

Samvrita yoni should be dilated with the help of fingers.^[3]

Further in *Samhitas*, in relation to *Prasuti Tantra* (Obstetrics), the procedure for extracting *Mudhagarbha* (Difficult / Obstructed Labor & Malpresentation of Fetus during Labor) with *Hasta* (hand) has been described in detail.^[4] For extracting *Mudhagarbha*, various acts like *Utkarshan*, *Apakarshan*, *Sthanapavartan*, *Udvartan*, *Utakartan*, *Bhedan* etc are to be done only with one hand taking care not to injure the mother and fetus.^[5] *Bhavaprakasha* giving detailed qualifications for the woman handling *Mudhagarbha* say that she should have experience of conducting several difficult labors,

command over knowledge of instruments and books. Besides she should be wise, bold, and capable of working with light / gentle hand.^[6]

Also while describing procedure of manual removal of retained placenta, *Acharyas* have stated that lubricated hand with trimmed nails should be inserted following umbilical cord and placenta is then delivered.^[7]

Yantra

“*Tatramanahsharirarbadhakaranishalyani, teshamaaharanopayoyantraani*”^[8]

Foreign bodies that cause pain to *Manah* and *Sharir* is called *Shalya* and the methods to remove these are called *Yantras*. Based on innumerable *Shalyas*, *Yantras* can also be innumerable. But to have bird’s eye view, *Acharyas* have classified *Yantras* into 101 types.^[9] Though *Yantras* are indicated for specific function but *Vaidya*, applying his *Yukti*, can use them accordingly to his purpose and can also invent and make new instruments.

Yantras can be taken as blunt instruments as per their description in texts. Based on the *Aakriti* or shape, *Yantras* are of 6 main types: *Swastika*, *Samdansa*, *Taala*, *Naadi*, *Shalaka*, *Upayantra*.^[10] In this article, 5 main types of *Yantras* are discussed.

Description of Yantras used in *StreeRoga* and *PrasutiTantra*

Swastika Yantra: These are 24 in number. They are named so because of their resemblance to *swastika* mark (cruciform); being joined by *Masura* (cereal) shaped nail at edges. These are 18 *Angula* long and bear resemblance like the face of various animals like *Sinhmukha* (lion), *Vrrikmukha* (wolf), *Vyaghramukha* (tiger), *Rikshamukha* (bear) etc. and birds like *Kankamukha* (heron), *Kaakmukha* (crow), *Bhasmukha* (eagle) etc. At their base (*Moola* part) they are bent like circular ring to facilitate grasping. These are used to remove *Asthigatashalya* (foreign bodies from bone).^[11]

Their use as such hasn’t been described in *Striroga* and *Prasutitantra*.

SamdansaYantra: *Samdansa* means to catch or hold. These are of two types:

- *Sanigraha* (With Catch)
- *Anigraha* (Without Catch)

These are 16 *Angula* long. These are used to extract *Shalya* from *Twak*, *Mamsa*, *Sira*, *Snayu*.^[12] *Acharya Vagbhata* has described them as:

Sanibandhana (with catch)
Nirnibandhana (without catch)

One type of *Samdanshyantra* is six *Angula* long and half *Angula* wide. It is used to catch *Akshipaksham*, *Vrana* and *Adhimamsa*.^[13]

Based upon above description, various types of forceps, used these days, can be considered under the category of *Samdanshyantra*:

- **With catch:** They are also called *Locking Forceps* e.g. Dressing forceps, *Vulsellum* (used to catch anterior lip of cervix), *Allies* forceps, *Sponge holding* forceps, *Needle holder*, *Artery* forceps, *Mosquito* forceps.

- **Without catch:** They are also called *Thumb Forceps* or *Dissecting Forceps*. It is of two types:

Plain forceps (used to catch tissue like mucosa and muscle while suturing episiotomy).

Toothed forceps (used to catch or hold skin while suturing).

Ovum forceps (used to extract retained products of conception) can be considered *Samdanshyantra* as it has no catch. They are also used to hold cotton swab or gauze to clean the wounds.

Taalyantra: They are named so because of their resemblance to palate of fish (scoop like). These are 12 *Angula* long. They are of two types:

Ektaal (having scoop at one end)

Dwitaal (having scoop at both the ends)

They are used to remove *Shalya* from ear canal, nasal cavity, *Naadi*.^[14]

Though their use hasn’t been described as such in *Stri Roga* & *Prasuti Tantra* at that time but in the present era, *Uterine Curette* and *Endometrial Biopsy Curette* can be taken under this category which are used for scraping of endometrium and endometrial sampling respectively.

Naadiyantra: *Naadiyantra* are of 20 types. These are hollow from inside. Briefly they are used for following purposes: *Srotogatashalyauddharnarth*, *Rogdarshananartham*, *Aachushanarth*, *Kriyasaukaryanartham*.^[15]

a) *Srotogatashalyauddharnarth* (to remove the *Shalya*/foreign bodies from *Srotas*)

b) *Rog Darshananarth* (to visualize disease)

Yonivranakshana Yantra: It is a type of *Naadiyantra*. It is 16 *Angula* long, hollow in centre, has four walls, surrounded with a ring from outside and resembles an unblossomed lotus flower. The base of all four walls is attached with small rods, the pressure on which opens or widens the mouth of instrument. It is used to visualize *Yoni vrana* (ulcers of vagina, cervix).^[16]

Various speculums used nowadays, to visualize cervix and vagina like *Cusco* speculum, *Sims* speculum and *Hysteroscope* can be taken under this category.

c) **Aachushan Karma:** In treatment procedure of *Stanavidradhi* (breast abscess), *Acharyas* have said that repeated milking (suction) should be done in all the stages i.e. in *Aamavastha* (inflammation), *Vidahavastha* (beginning of suppuration) and *Pakvaavastha* (suppurative stage) to prevent suppuration and formation of sinus.^[17]

Breast pumps used nowadays are a type of *Naadiyantra* used for suction of milk (*Aachushanarth*). Other examples are - for Medical Termination of pregnancy - *Karman’s Cannula*, *Menstruation Regulation Syringe* is used. *Ventouse* suction device, *Mucous sucker* are used during delivery.

d) **Chikitsa Karma Hetu:** *Dahana karma* (cauterization) and *Kshar karma Hetu* in *Garbhashayagrivamukha-gatvrana* (cervical erosion).

Naadi Vrana Prakshalana / Abhyanga Yantra: For *Abhyanga* (uncting) of *Yonisthitanaadivrana* and *Prakshalana* (washing) of *Naadivrana*, two instruments

should be made. These are 6 *Angula* long just like *Bastiyantra* and are made up of two parts i.e., bag and nozzle^[18]

It can be compared with wound syringe. Now a days Douche bag and nozzle is used.

Shalaka Yantra: These are not hollow from inside. These are 28 in number. Among these, *Yantras* that are used in *Stree Roga* and *Prasuti Tantra* are:

- **Gandupadmukhi Shalaka:** The upper end of this *shalaka* is slightly curved e.g. Uterine Sound / Sim's Uterine Probe with centimetre graduations (for examining uterus), Bladder Sound, Hegar's Dilators (used for dilatation of the cervix in various procedures e.g. D&C, D&E, Fothergill's operation, Hysteroscopy, Cervical stenosis), Sim's Anterior Vaginal Wall Retractor, Bougies.
- **Sarpaphanamukhi Shalaka:** It's shape is like serpent's hood. It is used to retract the incised part e.g. Landon's Bladder Retractor; during Cesarean section Doyen's Retractor is used.
- **Badishmukhi Shalaka:** *Acharya Sushruta* has included *Badisha* under *Shalakayantra* and *Shastra* both. These are 2 in number and are a type *Shalakayantra*. Their length, circumference should be according to the need and are used for extraction of *Mudhagarbha*.^[19]
- **Karpasa kritoshniya Shalaka:** It is of 6 types, cotton is applied on its upper end e.g. Sterile Cotton Swab used for taking vaginal smear for culture. It is also used for cleaning of wounds and applying *Kshar*.^[20]
- **Jambavavadana Shalaka:** Upper part is oblong like seed of *Jambu*. It is of three types – *Sthula*, *Anu* and *Dirgha*.^[21] In *Streeroga*, its use has been described in *Dahana karma* (cauterization) in *Sannipataj-upadansha*. Decayed portion of vulva in *Upadansha* should be excised and remaining portion cauterized with *Jambuushthashalaka*.^[22]

Above description clearly depicts thermal cautery procedure done nowadays for various gynaecological diseases.

- **Mutramarga Vishodhini Shalaka:** It is long and broad like *Pushpavrinta*. It is used for *Vishodhana* of *Mutramarga*^[23] or dilatation of urethral passage or in urethral stricture e.g. urethral sound or Bougie.
- **Garbha Shanku Shalaka:** Both *Vagbhata*s have included *Garbhashanku* under *Shalakayantra*. It is eight *Angula* long, curved like a hook and is used for extraction of *Mudhagarbha* (obstructed fetus).^[24]

However in a commentary on *Ashtanga Samgraha* by *Indu*, its length is described as 18 *Angula*. *Acharyas* have described that after perforating the head with *Anguli* or *Mandalagra shastra* and subsequently extracting the flat bones of skull, the surgeon should grasp the chest, axilla, chin, palate with *Shanku* and extract the fetus.^[25]

Above description is indicative of decapitating procedure done to extract dead obstructed fetus in modern science

e.g. *Jardine's Decapitation Hook & knife*, *Ramsbotham's Decapitation Hook & Saw*.

Angulitranakyantra: As described in *Samhitas*, it was used to guard fingers while doing *Shalya karma* e.g. Finger guard or Surgical rubber/ latex gloves used nowadays.

Acharya Vagbhata has described its shape as '*Gostanakriti*'.^[26]

Badishamukhi Yantra: It is also described under *Shastra* for extraction and its upper end is curved. It is indicated for *Aaharana* of *Mudhagarbha*.^[27]

Various types of hooked instruments can be taken in this category. For example: Blunt Hook – a destructive instrument used to pull the fetal neck or fetal extremities. Extraction of foreign body(IUCD) from uterine cavity by using hooked forceps i.e. IUCD removing hook.

Shastras

These are taken as sharp edged instruments and are twenty in number. Those used in *Stree Roga* and *Prasuti Tantra* are described here.

Mandalagrashastra: As per description in *Samhitas*, it is used for *Cchedana* (excision) and *Lekhana* (scraping) *karma*. Its shape is just like nail of index finger. It is also used for excision and scraping in the diseases of eyelids, overgrown muscular tissue of gums, *Cchedana* (excision) of *Galshundika*. *Acharya Sushruta* while describing the *Shalya karma* for extraction of *Mudhagarbha* has said that the surgeon should very carefully split/ cut the part of the fetus which is producing obstruction with the help of *Mandalagrashastra*.^[28]

It can be correlated with Circular knife.

Vridhhi Patra: It is *Kshurakara* (razor like) and is used for *Cchedana* and *Bhedana* (incision)*karma*.^[29]

It is of two types:

- *Rriju (Praayatagra)* : It is straight
- *Natagra (Anchitagra)* : It is curved

Acharya Sushruta while describing destructive operation for *Mudagarbha*, has restricted the use of *Vridhipatra*. Being sharp edged instrument there is risk of maternal death due to injury.^[30]

Utpalapatra Shastra: It has a sharp edge like that of *Utpala* leaf. The size of blade is 3x1 *Angula* and is used for *Cchedana* and *Bhedana*.^[31]

Lancet is similar to this.

Ardhadhara Shastra: It is similar to *Utpalashastra* in length i.e. 8 *Angula* and the size of blade is 2x1 *Angula*. In the management of *Mudhagarbha*, *Acharya Harita* says that with *Ardhachandra Shastra*, both arms of fetus should be cut and fetus should be extracted.^[32]

It is comparable to half edged knife or curved Lancet.

Vetasapatra Shastra: According to *Bhoja*, its blade is 1 *Angula* broad and 4 *Angula* in length. It is used for *Vedhana karma*.^[33]

It is comparable to Scalpel or Narrow blade knife.

Scalpel, Lancet and other sharp ended instruments can be considered under this type. Bard Parker's Knife/

Surgeon's Knife (No 10 scalpel blade is most commonly used size). Acute angle of No 11 blade is used for giving stab incisions for drains and in draining abscesses e.g. Bartholin's abscess.^[34]

Mudrika or Anguli Shastra: In this instrument, a ring of the size of first knuckle of index finger is fitted with half *Angula* size of blade. The ring is tied with a strong thread. It is used for excision, incision or perforation of obstructed fetal head in *Mudhagarbha*.^[35]

Finger Knife can be correlated with this.

Badisha Shastra: Its use has been described for extraction and its upper end is curved.

Dalhana has mentioned its length as 6 *Angula* and that it has sharp upper end like a thorn. Further it is of two types:

- *Natyaanata* (not much curved)
- *Swaanata* (too much curved)

The curve of *Naatyaanata* is semicircular just like half moon and of *Swaanata* is much bent.

In Ayurvedic classics while describing treatment principle of excision of *Arbudas*, *Acharyas* have said that *Arbuda* caused by vitiation of *Mamsa* and *Rakta* by *Vayu* should be treated by complete excision with *Mandalagrashastra* after holding with a *Badisha*.^[36]

Sharp hooks e.g. Breech hook with Perforator can be considered under this type.

Suchi (Needle): Detailed description about *Suchi* is available in *Samhitas*. Their use has been described for *Vedhana* (puncturing) and *Seevana* (suturing) *karma*.

Suchi is of three types:

- *Vritaanguladwaya* (Round body needle, 2 *angula* long): It has been used for suturing *Alpamamsasthana* (less muscular structures), soft tissues and in joint area.
- *Tryaangulatryastra* (Triangular body needle, 3 *Angula* long): It has three edges. It has been used for suturing *Mamsalsthana* (muscular area, skin).
- *Dhanuvakra* (Curved needle): It has been used in *Marmaphalakosha* and *Udara*. It can be triangular like *Tryastra* or round like *Vrita*.^[37]

In context of *Prasuti Tantra*, *Acharya Charaka* while giving description of articles to be stored in *Sutikagaar* has said that two *Suchipippalaka* (needles made of gold or silver) should be kept along with other articles^[38]. This clearly indicates suturing procedure done at that time for suturing perineal tears if any, during labour.

Shararimukha Shastra: It resembles the long beak of a bird – *Sharari*. It is 10 *Angula* long; pointed at one end and broad at other end. It is a straight scissors.

Curved Scissors are termed as **Aattimukha**– resembling the beak of *Aatti* bird. *Dalhana* has called it as '**Kartari**'. It is used for *Raktavisravana* (bloodletting or drainage of pus).^[39]

Episiotomy scissors, Umbilical cord cutting scissors, Embryotomy scissors are the examples of *Shararimukhashastra*.

Discussion

Acharya Sushruta enumerates 101 varieties of blunt instruments and 20 different kinds of sharp instruments, which should have an edge so fine as to divide the hairs on the skin. The instruments made chiefly of iron include scalpels, lancets, saws, scissors, needles, hooks, probes, directors, sounds, forceps, trocars, catheters, syringes, bougies, rectal & vaginal speculae.

'Most modern surgical instruments are only slight modifications of those used by the ancient Hindu Surgeons'.^[40]

Instruments of iron; some are to cut as shears, razors and lancets. And some to draw out diverse things, as tongs and pincers. And some to know the deepness of sores, as spatulas and searchers; And some be to sew as needles and pipes. Thomas Morstede, Fair Book of Surgery, 1446.^[41]

CONCLUSION

As has been said repeatedly, we stand on the shoulders of our forebears, and appreciation of this heritage is perhaps more necessary than ever as innovation rapidly succeeds innovation. Based upon the description given in ancient classics of *Ayurveda* in context to *Yantra - Shastras* (surgical instruments) it can be concluded that almost every instrument used in present era either for conducting medical examination or medical/operative procedure was being used over ages in *Shalya Chikitsa* as well as in *Stri Roga and Prasuti Tantra*.

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