

YANTRA: FROM TRADITION TO TOMORROW – TRADITIONAL BLUNT INSTRUMENTS AND THEIR MODERN INNOVATIONS

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ABSTRACT

Yantras have been used for centuries to facilitate healing and promote overall well being. These tools, designed with meticulous care, are employed in various therapeutic and diagnostic techniques. In recent years, there have been significant modifications and innovations in the design and application of yantras to enhance their effectiveness and adapt them to contemporary needs. New materials, ergonomic designs and advanced manufacturing techniques are incorporated to improve the precision and comfort of these instruments. This article delves into the historical significance of yantras in Ayurveda, their traditional uses and the contemporary modifications that have evolved to meet the need of today's.

KEYWORDS: Yantra, Hasta, Blunt instruments.

1. INTRODUCTION

In Ayurveda, the use of yantras – blunt instruments – holds a significant place. These tools, designed with precision and purpose, are employed in various therapeutic procedures to enhance healing and promote overall well-being. Unlike sharp instruments, yantras are used to perform gentle procedures and facilitate other procedures.

2. MATERIALS AND METHODS

Literature searches regarding Yantra and blunt surgical instruments were carried out through various Ancient Samhita and its available commentaries, Authorised text books, Journals - Published articles and Databases.

3. RESULTS

3.1. DEFINITION: Any object that causes pain to the mind and/or body is considered as Shalya. The means of extraction of that object or foreign body is considered as Yantra.^[1]

3.2. TYPES OF YANTRA^{[Table No.1]:} They are of 6 types – Swastika yantra (Cruciform instruments), Sandamsha yantra (Dissecting forceps), Taalayantra (Scoops), Nadiyantra (Tubular instruments), Shalakayantra (Rod like instruments) and Upayantra (Auxiliary instruments).^[2]

3.3. NUMBER OF YANTRA

Yantras are 101 in number.^[3]

Table No. 1: Classification of Yantra & Number.

YANTRA	SUSHRUTA ^[4]	VAGBHATA ^[5]
Swastika	24	24
Sandamsha	2	2
Taala	2	2
Nadi	20	28
Shalaka	28	34
Upayantra	25	19
Harita Samhita – 12 yantra		

3.4. PRADHANA YANTRA: Pradhanatama yantra is Hasta^[3] (skilled hand) because.

- i. A skilled person is needed to initiate the working of yantra.
- ii. Hasta is the one which controls the different yantrakarma.

Pradhana yantra: Kankamukha swastikayantra is considered as Pradhana yantra.^[6]

3.5. MATERIALS USED FOR MAKING YANTRA:

Loha is the material to be used for manufacturing instruments. As per Dalhana, Loha denotes Swarnadi Panchaloha (Swarna, Rajata, Tamra, Kamsya, Loha). In its non availability, Venu, Danta, Shringa, Daru, Vruksha, Ashma, Valkala, Sutra, Trina and Snayu are utilized.^[7]

3.6. DEVISING OF YANTRA: Yantras are designed based on the factors like: i. In resemblance with the mouth of different birds and animals ii. Ideal characteristics told in Shastra iii. Experience shared by learned old surgeon iv. Other instruments used for different purposes – like in wars, households, etc. v. Based on usage – Vaya, Linga.^[8]

3.7. YANTRA SAMPAT: The instruments should be made of good quality material, having appropriate measurement with serrated or smooth functional end, less fearful in appearance and good handles with grip.^[9]

3.8. YANTRA DOSHA: The instruments should be too broad/ thick, too light - made with bad variety of material/ without strength, too lengthy, too short, distorted functional end, dysfunctional end, crooked / irregular, loosely fitted, raised/ elevated, possessing soft/ loose pins/ bolts, fragile mouthed and fragile gripped. These are considered as the defects of Yantra.^[10]

3.9. PRASHASTA YANTRA LAKSHANA: Yantra devoid of 12 yantra dosha and those having 18 A length are considered as best.^[11]

3.10. YANTRA KARMA: There are 24 Yantra karmas. Forcing out, Filling, Binding, Displacing, Spherical arrangement, Mobilising, Retraction, Exposing, Compression, Cleansing of passages, Drawing, Extraction, Pulling, Elevating, Bending down or depressing, Breaking, Churning, Suction, Probing, Splitting, Straightening, Washing, Blowing and Wiping off are the functions of blunt instruments.^[12]

3.11. DESCRIPTION OF EACH YANTRA AND IT'S MODERN CORRELATION

3.11.1. SWASTIKA YANTRA^[13]

- Dimension – 18 A
- Number – 24
- Types – 2
- Simhamukha – 9
- Kankamukha – 15

- Function: Deep seated/ bone stuck foreign body removal
- Parts – Mukha, Keela, Varanga
- Modern Instruments: Artery forceps, Tissue holding forceps, Sponge holding forceps, Cheatle's forceps

3.11.1.1. CHEATLE'S FORCEPS^[14]

- It is a large, heavy metallic forceps with curved blades.
- The blades have large serrations which help in getting a better hold of instruments being held with it.
- It has no lock.

USES

- It is an instrument which is used to select and pick sterilized and autoclaved articles like drapes, instruments etc. The instrument is used to avoid touching sterilized articles with hands while transferring them from one tray to another tray.
- It is usually kept dipped in an antiseptic solution such as Cidex, Dettol water.

3.11.1.2. RAMPLEY'S SPONGE HOLDING FORCEPS^[15]

- It is a long instrument with thin shafts.
- It has a catch –lock which helps in holding the sponge / swab firmly, while cleaning.
- The blades are fenestrated near its distal end and the inner aspect of the blades are serrated.

USES

- Most common use is for cleaning the operative field.
- It is also used for swabbing a cavity e.g Vaginal canal.
- It can similarly used for packing cavities.
- It can also be used for mopping ooze from operative area, so that the structures can be identified easily.

3.11.1.3. ARTERY FORCEPS^[16]

Classification

Based on size shape

- Small or Mosquito
- Medium
- Large or Pedicular

Based on shape

- Straight type
- Curved type

Based on presence/ absence of tooth

- Toothed type: Eg. Kocher's
- Non toothed: Eg. Spencer wells artery forceps

Common Features

- It is a light but strong instrument
- The inner margins of the blades are serrated and on closure the blades are well apposed, leaving no gap in between.

- The blades are conical and blunt
- The blades can be held together by means of a catch lock

USES

- As a haemostat
- To crush the base of appendix during appendectomy
- To hold the cut edges of fascia, aponeurosis, peritoneum, after incising them, during dissection or for closure after surgery.
- To open up the abscess cavity, breaking all the loculi
- To hold free end of sutures during suturing.

MOSQUITO ARTERY FORCEPS

- The basic features are essentially the same
- It is very small in size and has relatively pointed tips

USES

- It is used for holding small pointed bleeding sites. It stops bleeding by crushing the bleeder.
- To hold gauze pellets for blunt dissection

KOCHER'S ARTERY FORCEPS

- It is a toothed variety of haemostatic forceps, having a single sharp tooth at its tip
- Rest of the features same

USES

- It is specifically used to hold the retracting cut ends of the vessels in tough fibrous tissues such as in palms, soles and scalp.
- To catch hold of perforating vessels
- To hold pedicles, tough structures, cut ends of the muscles.

3.11.1.4. ALLIS TISSUE FORCEPS^[17]

- The blades are straight along its long axis and are separated by a space, except at the tip.
- The tip has got sharp teeth, which interlock on closing
- It has got a catch lock mechanism for closing

USES

- This is used to hold thin but tough structures for the purpose of giving traction onto these structures e.g for holding skin, deep fascia, rectus sheath, etc.
- It can also be used to hold tissues like fibrous capsule of a structure for dissection.

3.11.1.5. BABCOCK'S TISSUE FORCEPS^[18]

- It is a non traumatizing type of tissue forceps
- Its blades are curved and fenestrated.
- The tip of the blades is in the form of a transverse bar with transverse serrations on its inner aspect

USES

- It is used to hold soft and delicate tissue like fallopian tubes, ureter etc,

- Due to its non traumatizing nature, it may be used to hold gut wall as in colostomy, gastrostomy etc.
- It may be used as hemostat when the bleeder is difficult to pinpoint

3.11.1.6. NEEDLE HOLDER^[19]

- The blades are much smaller as compared to handles
- The blades have criss cross serrations. It may have a groove, for the needle, on its inner surface
- It may be a straight or a curved type

3.11.2. SANDAMSHA YANTRA^[20]

- Dimension – 16 A
- Number – 2
- Types – 2
- Sanigraha
- Anigraha
- Functions: Foreign body removal from Twak, Mamsa, Sira and Snayu
- Acc. to Vagbhata: Kilabaddha, Vimuktagra, Shadangula & Muchunti^[21]

3.11.2.1. MUCHUNTI YANTRA^[22]

It has small teeth, straight, provided with a ring at its root, helpful in holding fleshy parts from deep wounds and remnants of Arma which has been cut.

Modern Instruments: Dissecting forceps, Adson's thumb forceps.

3.11.2.2. DISSECTING FORCEPS^[23]

Types

1. Plain
2. Toothed

GENERAL FEATURES

1. The forceps are designed in such a way that on pressing their limbs, the tips are well apposed and they do not slip against each other.
2. The outer surface of dissecting forceps is made rough by the grooves and ridges. This helps in giving a firm grip.
3. The toothed forceps have teeth on the inner surface of the tip.

USES – PLAIN FORCEPS

- These are used for holding delicate structures like peritoneum, vessels, bowel wall etc.
- These are also used to hold skin over face and cartilage for stitching purposes.
- It is used to dissect soft friable tissues.

USES – TOOTHED FORCEPS

- It is used to hold tough structures like skin, fascia, rectus sheath etc.

3.11.3. TALAYANTRA^[24]

- Dimension – 12 A
- Number – 2

- Types – 2
- Ekatala
- Dwitala
- Function: Foreign body removal from Karna (Ears), Nasa (Nose) and Nadi (Other passages/ sinus)
- Modern Instrument: Scoops

3.11.3.1. VOLKMANN'S SCOOPS^[25]

- It is a long instrument with scooped ends i.e, each of the ends has got a cavity with sharp edges. Such a construction of this instrument allows easy curettage by the sharp edges of the cavity (scooped end).

USES

- It is used for curetting bony cavities such as Brodie's abscess, formed due to Chronic Osteomyelitis.
- It is used to curette chronic ulcers and sinuses.
- It may be used to curette out the lining of cysts

- It can be used to pour drug into a cavity for dressing purposes.

3.11.4. NADIYANTRA^[26]

- These are hollow tubular blunt instruments.
- Number – 20^[Table No.2]
- Nadiyantra are described to be various kinds and serve many purposes
- They are open either at one end or both ends
- These are useful for
 - Extracting foreign bodies from different stratas
 - Visualising pathological conditions/ to observe the abnormalities inside
 - Aspiration of contents like vitiated blood, fluids etc
 - Convenience of other functions / to facilitate other surgical procedures
- Circumference / diameter of the instrument being the size of the orifice of the channels and their length as found convenient for effective use.

Table No. 2: Nadiyantra.

SL. NO.	NADIYANTRA	NUMBER	USE	MODERN CORRELATION
1	Bhagandara Yantra	2	Find the direction of fistulous tract	Fistula director
2	Arshoyantra	2	Visualising pathology & facilitating procedure	Proctoscope
3	Vranayantra	1	Vrana prakshalana	Aseptosyringe
4	Bastiyatra	4	Bastikarma	
5	Uttarabasti yantra	2	Administer Uttarabasti dravya	Rubber ball vaginal irrigation douche
6	Mutravridhhi yantra	1	Aspirating fluid in Hydrocele	Cannula part of Trocar & Cannula
7	Dakodara yantra	1	Aspirating fluid in Ascitis	Cannula part of Trocar & Cannula
8	Dhumayantra	3	Dhumapana	Nelson's Inhalation Apparatus
9	Niruddhaprakasha yantra	1	Dilatation	Urethral catheters
10	Sanniruddhaguda yantra	1	Dilatation	Rectal dilators
11	Alabu yantra	1	Raktamokshana	Cupping set, Suction apparatus
12	Shringa	1	Raktamokshana	Cupping set, Suction apparatus

MODERN INSTRUMENTS

3.11.4.1. PROCTOSCOPE^[27]

FEATURES

It is the instrument used to visualize the anal canal and the lower end of rectum.

It has two parts, the outer tube and an inner obturator. The outer tube has a handle attached to it.

USES

To diagnose piles, ulcers, growths of rectum.

For minor operation like injection of piles, polypectomy, rectal biopsy etc.

3.11.4.2. CATHETERS^[28]

A. Plain or Simple red rubber catheter.

B. Indwelling or self retaining type Eg. Malecot's catheter, Foley's catheter.

PLAIN CATHETER

It is a plain tube made up of red rubber, the terminal end of the tube is blunt and rounded.

It comes in a variety of sizes.

FOLEY'S CATHETER

It is a self retaining type of catheter which can be left in place for few days.

It essentially consists of a main channel for drainage and a side channel connected to a bulb near its terminal end.

The bulb can be inflated with saline or plain water.

The capacity of the bulb varies and is usually mentioned on the catheter.

The Foley's catheter is available in a variety of sizes, marked by numbers according to French scale.

USE: Urinary catheterization.

3.11.5. SHALAKAYANTRA^[29]

Rod like blunt instrument closed at both the ends.
Number – 28 & are of several types^[Table No.3]

Dimension: Having circumference and length according to application.

Table No. 3: Shalakayantra.

SL. NO.	TYPE	NO.	USES	SHAPE	MODERN
1	Gandupadamukha	2	Eshana	Earthworm head	Blunt probe
2	Sarpaphanamukha	2	Vyuhana	Snake's hood	Retractor
3	Sharapunkhamukha	2	Chalana	Arrow tail	Mobilisers
4	Badishamukha	2	Aharana	Fishing hook	Surgical hooks
5	Masuradalamatramukha	2	Srotogata-Shalya uddharana	Lentil, slightly bent at top	Scoops
6	Karpasakrita ushneesha	6	Pramarjana	Cotton bud	Swab probs
7	Darvyakriti khalla mukha	3	Kshara	Laddle shaped	Spatula
8	Jambavavadanani	3	Agnikarma	Jambu fruit	Cautery leads
9	Ankushabadanani	3	Agnikarma	Semicircular	Cautery leads
10	Kolasthidala matramukha	1	Nasa arbuda aharana	Jujube fruit seed kernel	Nasal blunt curette
11	Anjana shalaka	1	Anjana	Flower bud	Collyrium applicator
12	Mutramarga vishodhana shalaka	1	Mutramarga vishodhana	Stalk of Malati flower	Urethral dilator

3.11.5.1. URETHRAL DILATOR^[30]

It is an olivary tip instrument with a long shaft. The shaft is gently curved near its tip. It has a small circular handle which bears the size of the dilator.

USES

For dilating urethral strictures.

For dilating normal urethra prior to cystoscopy. The normal adult urethra usually accommodates a 11/14 sized dilator.

3.11.5.2. RETRACTOR^[31]**TYPES****Plain**

For superficial retraction: Eg. Langenbeck's retractor

For deep retraction: Eg. Doyen's retractor

Self Retaining

Screw adjusted types

Catch locking racks

LANGENBECK'S RETRACTOR^[32]**FEATURES**

It is a retractor with a small solid blade and a long blade. It can also be double bladed. The long handle is advantageous as it allows better maneuverability, without obstructing the surgeon.

USES

It is used for retraction of skin edges or big vessels and nerves.

It is used in operations like hernioplasty, involving a lot of superficial dissection and retraction.

3.11.6. UPAYANTRA^[33]

Upayantras are those which are similar to yantras, but are inferior to yantras.

These can be used in the whole body, or the organs of the body, in Sandhi, Koshta, Dhamani according to the need. Number – 25

Upayantra: Rope, Intervined rope, Roller bandage, Leather, Bark, Creeper, Cloth, Pebble, Stone, Hammer, Palm, Sole, Index finger, Tongue, Teeth, Nails, Mouth, Hair, Bridle of horse, Branch of tree, Spitting, Vamana etc., Happiness, Magnet, Kshara, Agni, Medicines.

Applicability of Upayantra

- If a SHARASHALYA has got lodged in Asthi or deep tissues, then it can be removed by tying it with RAJJU, VENIKA, LATA and the other end of these being tied to a SHAKHA which inturn connected to ASHWAKATAKA. So when the horse is whipped, it will raise its head such that the shalya in pulled.
- For any LOHAJA SHALYA, can use AYASKANTA.
- A shalya which is stuck up on the person's body at the warfield can be removed by the action and counteraction of PANITALA and PADATALA.
- ANGULI can be used to probe for ESHANAKARMA.
- SHTIVANA & PRAVAHANA is the spontaneous reaction for the Sharirika Shalya like Kapha, Pitta, Akshiraja shalya in the form of VAMANA, VIRECHANA, ASHRUPAVRTTI.
- ASHTILA, ASHMA, MUDGARA – these are used to mobilise the Shalya and facilitate its easy removal.
- PATA, CHARMA, ANTARVALKALA, VASTRA, LATA – can be used for BANDHANA.
- HARSHA – to remove DUKHA (Manasika Shalya).

- BALA – can be used for PRAMARJANA & removal of shalya from MASTULUNGA (BAALAVARTI)
- MUKHA – For AACHUSHANA

3.11.6.1. TOURNIQUET^[34]

Two Types: Simple & Pneumatic

Features

It is either made of linen/ synthetic material. It has got a strip and stick mechanism for tying and untying the tourniquet.

USES

It is used for making the superficial veins prominent - for the purpose of setting IV drips and for collecting blood samples.

4. DISCUSSION

‘Most modern surgical instruments are only slight modifications of those used by the ancient Hindu Surgeons’.^[35] Acharya Sushruta enumerates 101 varieties of blunt instruments and Hasta is considered as the Pradhanatama yatra. The surgical instruments such as forceps, dilators, scoops etc. are similar to the 101 yantras mentioned in Samhitas. The evolution of yantras from traditional instruments to modern devices highlights the enduring relevance of Ayurveda in contemporary healthcare. The integration of traditional yantras with modern technology has led to innovations that enhance their effectiveness and applicability in contemporary medical practice.

5. CONCLUSION

Yantras are the instruments, designed with simplicity and efficacy, have evolved over centuries to support the diverse treatments describe in the Samhita. As modern medicine advances, the integration and innovation of these traditional tools also happened, bridging the ancient wisdom with contemporary technology. These traditional tools continue to evolve, meeting the needs of todays while staying true to their ancient origins.

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