A STUDY OF UPYANTRAS (SUBORDINATE INSTRUMENTS) TO ACCENTUATE ITS IMPORTANCE IN SURGICAL AND MEDICAL PROCEDURES: A CRITICAL REVIEW

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ABSTRACT: Sushruta has given the description of 101 blunt surgical instruments. He has included upyantras as a type of major six classes of yantras. Today in modern scenario, where the science is going to its highest peak and medical science is becoming hi-tech day by day, emphasis on knowledge of upyantra seems quite obsolete. But sometimes the situation arises when we don’t have proper sufficient medical facility to work such as disaster, war, natural calamities and many more, knowledge of Upyantras can provide us a different vision about the use of these insignificant tools.

Key Words: Upyantra, anuyantra, Yantra, surgical instruments,
INTRODUCTION: In Ayurveda, Shalya tantara or surgery is considered as prime branch, because of quick action (Ashukriya karnaat), use of sharp and blunt instruments, use of Kshar and agnikarma like para-surgical or OPD based procedure (yantra shastra kshar agni pranidhanat) and having inclusion of all other treatment modalities which are common to other branches of medicine (sarvatrantrad samanyancha)

As per the so many different uses and uses at so many places, yantra or surgical instruments can be numerous. They can be designed as per the need and according to need of surgeon. Generally these instruments are made up of metal or metal like substances. Upyantra or Anuyantra are non metallic subordinate tool or items which can be used in the absence of real surgical instruments. As per the Dalhana, The tools which are not an instrument and still they work as an instrument (yantra samipvartaani) or subsidiary to them (hinyantraani) are called Upyantra. However, Sushruta has included upyantras in the classification of the 101 type of yantras and counted 25 in number. Vagbhatta (Ashtang Hridaya) has taken only 19 upyantras in account and termed as anuyantra. While Ashtang sangrah counts 21 upyantras.

AIM: The aim of this study is to emphasize the importance of Upyantras in medical and surgical practice.

MATERIAL and METHOD: Review of Brihaddtrayi Sanhitas along with some important texts of Ayurveda was done in special reference to Upyantra or anuyantras.

REVIEW OF LITERATURE: Sushuta and Vagbhatta have given the detail description regarding upyantras.

Ayurveda References:
1. Sushruta Sanhita Sutra Sthana Chapter 7
2. Ashtang Sangrah Sutra Sthana Chapter 34
3. Ashtang Hridaya Sutra Sthana Chapter 25

Classification: Sushruta has mentioned 25 upyantras, while additional 5 upyantras are supplemented by Vagbhatta i.e., Antra, Vraghna, Kala, Paka and Bhaya.

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Table 1: Showing the list of Yantra mentioned in classics
1. **Rajju:** This is a simple rope formed of *munja* fibers, which is used in tying. Rope ligation is required mainly during snake bite. This technique is known as *Arista bandhan* \[^8,9\].

2. **Venika:** This is formed by poly filament of *rajju*, which contains three strings. This is used for tight knots. A tourniquet has the same purpose.

vastram), Karpas (cotton), Dukool (Valkal vishesh bhavam), kausheya (koshakara jantukrita tantu maya) etc. Patta is also used in context of Bhagna chikitsa. Kusha is tied after bandaging with patta[11].

4. **Charma:** Charma or leather pieces are also used for bandaging. Gophana bandha is tied in cases of rectal prolapsed. This is like T-bandage[12]. Charma is also mentioned to use in cases of Jalodara after fluid tapping[13].

5. **Antarvarkal:** Internal part of bark of trees like Kanchnaar, is known as antarvarkal. It is soft and flat like a cloth. This is used in Vrana bandhana and vrana seevan[14].

6. **Lata:** Lata is soft, flexible and good strength stem of creeper plants. It can also be used for tying at different places.

7. **Vastra:** Sterile cloth or linen is used during surgical procedures to maintain the sterilized field for surgery. It is used for O.T. dress, cap, masks, drapes, bed sheets and also bandaging and slings. Vikeshika (dalhana), Kavalika (arundatta) and Pichu (Arundatta) are also prepared with vastra.

8. **Ashthilashma:** Ashthila term is used in relation to prostate in ayurveda. The consistency of enlarging prostate is like Ashthila or stone[15]. Shalya imbedded in bone (Asthi) is removed with its help[16].

9. **Mudgara:** If a stone is tied at one end of a stick, it is called Mudgara. It looks like a hammer and is used for giving heavy stroke for nailing during orthopedic surgeries.

10. **Pani-Pada Tala evam Anguli:** Sushrutas has quoted hand as the chief of pradhan yantra and included palm, sole and finger in upyantras[17]. Vimlapana or rubbing is the first step of Saptvidh upakrama. Vimlapana is done with fingers (Vimlapanam angulyadinam mardanam-Chakrapani). After incision in abscess, finger is used to break the loculi within it[18]. Gras shalya or chocking by food bolus is treated by Mushti prahara[19]. Reduction of dislocation of hip joint is done by Chakrayoga with the help of hand[20]. Charak has also indicated reduction of mandibular dislocation with the help of thumb and index finger[21]. Finger wrapped with hair tuft is rotated in throat for placenta expulsion[22].

11. Ano-rectal and vaginal examination is done with finger itself. Dr. P. Hemantha Kumar has mentioned anguli as pradhan yantra in anal diseases (Anguliyevam pradhane yantram gudvikare). Vagbhatta has indicated use of finger for fluctuation test for pus in abscess. Pada tala is used in extraction of shalyas from any bony cavity[23].

12. **Jihva:** Jihva or tongue is used for removal of foreign bodies from cornea
(chakrapani). Surface or base of Shudha vrana is like tongue (jihvatalabho) [24]. Kukkur jihva is used in case of kshata and viddha vrana (chakradatta).

13. Danta: Few instruments are made up of Danta e.g. Arsho yantra. Hasti danta is used of roma sanjanana. Godanta rubbed on moist surface is used as daran lepa for pus removal in abscess. Few clinical symptoms are observed as bruxism e.g. Dantankhadai vepate in vatic ashmari.

14. Nakha: Fine tissues are grasped with nail. Fascia is separated by nails during surgical procedure. Nail shows different clinical features in various diseases.

15. Mukha: Mukha is used for suction to create negative pressure while handling some instruments such as Haemocytometer, Clapp’s suction ball, Shringa etc. For artificial mouth to mouth respiration is given emergency situation for resuscitation.

16. Baal: Baal or hair is used for seevan karma especially hairs of horse. Baal Varti is used in cranial injuries [25]. Keshunduk a special instrument, used for removal of Asthi shalya or foreign body entangled in throat is a ball or tuft of hairs tied with a rope or string [26]. Kesh ligation is also done in warts or mansankur.

17. Ashwakatak: The ring like iron part attached with bridle of horse is called ashwakatak. This is a technique to provide a sudden jerk like heavy pull to dislodge any deeply situated asthigata shalya. One end of rope is attached to ashwakatak and another one with shalya. Now, a whip is stroked to horse, he suddenly pulls his head and that shalya attached to other end of rope comes out [27].

18. Shakha: In same way to remove shalya, branch or shakha of a tree is pulled and the rope is attached to shalya and shakha. Then suddenly the pull is removed and shalya comes out [28]. This is an example to convert static energy into kinetic energy.

19. Shthiwan: Shthiwan or spitting or hypersalivation is the mechanism to push away the foreign body from mucosal surface in a natural way.

20. Prawahan: Prawahan is mentioned in context of extraction of anavbaddha shalya. Prawahan or straining is the technique used for excretion of flatus, feces, urine and obstructed labor [29].

21. Harsha: Harsha is also mentioned for extraction of anavbaddha shalya in Pranashta shalya addhyaya by Sushruta. Feeling of sorrow in hridaya is removed by harsha. Its use is also indicated while treating a case of Bhagna or fracture [30]. Hopeful patient recovers early [31].

22. Ayaskanta: Magnet can be used to pull out small iron particles from cornea. Sushuta has advised its use in anuloma, anavbaddha, akarna and analpmukha vrana [32].
23.24. Kshar and Agni: Use of kshar and agnikarma is considered as a special parasurgical procedure in ayurveda.

25. Bheshaj: Many drugs are used for cleaning and dressing of wound. In ayurveda, various drugs are mentioned for Shodhana, pachana, daran, ropan of vrana.

26. Bhaya: Fear or bhaya like condition provide a good analgesia to patient. To threaten a patient is useful in case of Unmad, moodgarbh, hikka, hysteria etc.

27. Kaala: Time is the best healer. Dosh dushya samoorchhana or samprapti is considered as the particular time for treatment. Shuddh vrana gets converted into dushta vrana after some time. Raktaj Gulma is treated after ten months [33].

28. Pakaj: If all measures of shalya nirharan fail, paka is done for its removal. Dhatu gets soften and pachyaman and gives way for its removal.

29. Antra: Antra or intestine is used now days to make suture material of catgut.

30. Vraghna: Vraghna or scrotal support or langot is recommended in testicular problems like hydrocele, varicocele, hernia etc and in post op cases of scrotal surgeries.

DISCUSSION and CONCLUSION: The above review provides a definite understanding about upyantras. Subordinate tools of medical or surgical procedure have their own significant importance. The knowledge on this topic also makes the practitioner to use the subsidiary tools in the absence of particular instrument and broaden their area of interest.

However, there are various items which we use daily in our operation theatre for surgical assistance and they are not even mentioned in textbooks. Recently during direct laryngoscopy for elective case, the laryngoscope’s light bulb unexpectedly failed. A flashlight Smartphone app was immediately activated on the attendant’s phone and used as an alternative light source without interrupting the laryngoscope. Due to wide angle of the flashlight, the larynx was well viewed and tracheal intubation was easily performed [34]. Surgical procedures are sometimes performed in torchlight of mobile phones in case of sudden power failure [35]. Use of nylon mosquito net in Hernia repair surgeries is also another example of upyantra vidhi which is adopted by modern surgeons in critical situations [36]. Few more examples are use of sand bag or infusion fluid bottle for positioning during cholecystectomy. Anesthetist commonly uses cotton twig to stick at nasal opening for
monitoring respiration. Use of condoms in place of gloves while examining ano rectal patient, use of feeding tube for suction purpose, use of syringe with an additional plunger for making suction drain, use of ice-cream stick as a tongue depressor, use of coin wrapped in cloth for tying at umbilicus in umbilical hernia in children are also some example.

Many simple techniques are used by professionals which are recognized like mouth to mouth respiration during resuscitation (mukha), placing per rectum finger in difficult cases of bladder stone (anguli), placing intestinal loop in saline solution to detect any perforation (similar to tyre puncture mechanic), induction of sneeze to blow out foreign body from nasal passage, flushing technique with fast iv infusion for urinary calculus etc.

It can be concluded that everything has its own importance ("Sarva Dravyam Yantram"). It’s safe and perfect use can be adopted by intelligent vision of surgeon as per the need.

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