

A Review Article on Endoscopic Instruments as Nadi Yantra and its applications in GIT Disorders.

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Abstract

Acharya Susruta, a great ancient Indian surgeon, who is regarded as father of the surgery, designed surgical equipment with innovative vision and described many surgical procedures, which laid basis for many advanced technologies in this field. Due to present day irregular, incompatible and unhealthy food habits diseases affecting the GI system increased in incidence and severity, simultaneously there is increase in advancement of technologies in a view to diagnose and treat GI disorders much earlier and more effectively than before. One among these advancements is the Endoscopic procedure which was invented solely for the diagnostic and therapeutic purpose of GI disorders. Acharya Sushruta has explained 20 types of Nadi Yantra for diagnostic and therapeutic purpose whose exact principles have been used in developing present day Endoscope. In this article an effort has been made to draw a special attention on Endoscopic instruments as variants of nadi yantra and their brief use in diagnosing and treating GI disorders.

Key words: Yantra, Nadi yantra, Endoscope, Endoscopic instrument, GIT Disorders

Introduction

Sushruta's concept of Nadi Yantra is the base for developing ENDOSCOPE - an advanced tool of the present day in the field of diagnosing and treating various disorders. Endoscope is a flexible tube with a light and camera attached to it and using which pictures of digestive tract is viewed on a color TV monitor. Gastro-intestinal tract consists of a hollow muscular tube starting from the oral cavity to rectum and anus.

Results and Discussion

Yantra¹

Shalya tantra is a vital branch of Ashtanga Ayurveda, which deals with removal of irritating factor. Out of fivefold of Shalya tantra, yantra is one of them. Fivefold of Shalya Tantra include Yantra, Shastra, Kshara, Agni or Rakthmokshana. Sushruta elaborates Yantra very briefly in Sushruta Samhita along with its Karmas. Yantra described in text as blunt instrument and 6 types based on Akriti as Swastika Yantra, Sandansa Yantra, Tala Yantra, Nadi Yantra, Shalaka Yantra, Upayantra.

There are different kinds of instruments used for removal of various kind of foreign body that cause pain to Manah and Sharir. Yantras are indicated for specific function but Vaidya. According to Yukti can also invent and create new instruments and use them accordingly to their purpose. Many functions of Yantra told by Sushruta are Nirghatana (pulling out after crushing), Unmathana (pulling out after twisting), Poorana (filling), Marga Sudhi (clearing the passage), Vyuhana (bringing together), Aharana (extracting), Bandhana and many.

Nadi Yantra ²

Acharya Sushruta has mentioned 101 yantras out of which 20 are called Nadi Yantras or hollow instruments with one or more opening and useful for recognizing foreign body and disease which are localized in tissue. Their width and parameter vary as per size, shape of the channel. Nadi Yantra are Anekprakarani, Anek Prayojanani, Ekatomukhani, Ubhayatomukhanani, and Its length is Srotodwarparinahan Vathayogdirghani.

Nadi Yantra are used for following purposes like-

Rogdarshnartham [visualizes the abnormalities inside the channels]

Kriyasaukyartham facilitate the surgical and paramedical procedures.

Aachushanartham [aspiration of content]

Srotogatashalyaudarnartham [extracting foreign bodies from the tubular structure].

Out of which first one is for diagnostic use and rest are for therapeutic purposes. Some varieties of Nadi Yantra are used in conditions like Bhagandra, Arsha, Basti, Uttarbasti etc. Other instruments like Alabu and Shringa come under this category. Nadi Yantra which is 10 Angula in length and half Angula in diameter has many openings of different size and thickness.

Types of Nadi Yantra ³

- Arsho Yantra is an instrument to see the haemorrhoid inside the rectum. It is cylindrical in shape and is four Angula in males and six Angula in females with two opening one at each end useful for seeing the pile mass.
- Sami Yantra is very similar to Arsho Yantra but without opening. It has functions like squeezing the pile mass and also used to check the malignancy of tumor and polyp of nose etc.
- Anguli Tranaka Yantra is also called as finger protector made from wood which is four Angulas in length with two opening and shape like Gosthanakar (nipple of cow) and is used to look the vagina and wound. Some instruments are hollow in the middle which are 1 Angula in length with four flaps which resembles like bud of lotus.
- Nadi Yantras used in Jalodra [ascites] have two opening one at each end or it can also be with the shape of the tube of a peacock feather. Another instrument named Shringa [animal horn] is used for sucking the pus.
- Alabu type of instrument known as hollowed gourd works as a suction pump. When it expands a vacuum is created inside thus sucking the pus and expelling the vitiated pus.
- Ghati Yantra is useful for making the abdomen tumour soft.
- Shanku Yantra (hooks) is used for pulling the impacted foetus in women for which another name is Garbhashanku Yantra.

Some instruments are used for extracting the stone from the urinary bladder. Some are used for

extracting the mouth the rod like instrument meant for clearing the sinus.

Jambauvostha is a cylindrical smooth stone like instrument used for application of caustic alkali. Some instruments are used in hernia, clearing ear, cauterization of polyp and nose tumour. Anu Yantra is an accessory instrument.

Nadi Yantra and Endoscopy

Nadi Yantras which are twenty in number are hollow instruments and are used for Rogadarshnartham, Kriyasaukyartham, Aachushanartham out of which Rogdarshnartham are used as diagnostic purposes whereas rest as therapeutic purposes. Acharya Vagbhata has specially mentioned Kantha Shalyavalokinani Nadi Yantra and Gharan Arbudo Arsho yantra which can be compared to present days laryngoscopy and rhinoscope respectively. Endoscopy is a non surgical procedure used to examine a person's digestive tract. Fibre-optic endoscopes use bundles of thin glass fibers to transmit light to and from the organ being viewed. Fibers use the principle of total internal reflection to transmit almost 100% of the light entering one end to the other end.

Endoscope consists of rigid and flexible tube, a light delivery system to illuminate the organ or object under the inspection. The light source normally outside the body and the light is typically directed via an optical fiber system. A camera transmits image to a screen for image capture. An additional channel allows entry of medical instruments or manipulators.

Application of Endoscopy ⁴

- Esophagogastroduodenoscopy [EGD] is most commonly performed endoscopic procedure in this world. Exact visualization of the oesophagus, oesophageal junction, stomach, duodenal valve and second part of the duodenum can be obtained. It is used for viewing esophageal strictures, hiatus hernia, gastric ulcer, cancer stage.
- Enteroscopy is used to view the inner lining of the small intestine. It is a long flexible tube, end side there is a camera that is inserted through the mouth and down into the stomach. Due to this a physician is able to view the inside of digestive tract, stomach or also take a piece of biopsy for histopathological study. Some signs and symptoms indicate the physician to go for investigations like enteroscopy in conditions like bleeding in digestive system, malnutrition, and severe diarrhea, suspected or confirmed tumour.
- Colonoscopy is a procedure with which a physician evaluates inside the colon. It is a four-foot-long flexible tube, about the thickness of a finger with a camera on its tip, with a source of light. The tip is inserted into anus which goes inside rectum through the colon usually far as the caecum. It may be done for a variety of reasons like blood in stools, prolonged abdominal pain, colon cancer, diarrhea and any polyp present there. Colonoscopy is the best diagnostic tool to diagnose diseases like ulcerative colitis or Crohn's disease ⁵.
- Sigmoidoscopy is examination of the rectum and colon more fully than is possible by proctoscopy. Proctitis, polyps and carcinomas may be viewed by sigmoidoscopy ⁶.
- Chromoendoscopy- in this technique physician uses dye or stain on the lining of the intestine during endoscopy for better visualization of anything abnormal or intestinal lining.
- EMS (Endoscopic mucosal resection) is a procedure to remove precancerous, early-stage cancer or other abnormal tissue from the digestive tract.
- EUS (Endoscopic ultrasound) is a minimal invasive procedure to assess digestive and lung disease.
- NBI (Narrow band Imaging) is a special filter to help view vessels and mucosa.
- ERCP (Endoscopic retrograde cholangio-pancreatography)- this procedure involves the use of side viewing duodenoscope, which is passed through the pylorus and into the second part of the duodenum to visualize the papilla ⁷.
- Proctoscopy is performing to detect the carcinoma of rectum, anal fissure hemorrhoids, internal opening of an anal fistula and rectal polyp ⁸.

Capsule endoscopy is a therapeutic endoscopy which allows seeing whole GI tract. It sends images to a receiver attached outside the body.

Laryngoscopy – a continuous light of endoscope helps in studying gross structure and function of larynx ⁹.

Conclusion

As 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. Endoscopy has both diagnostic and therapeutic applications for viewing and diagnosing various conditions of the gastrointestinal system. The recent advancement in the field of endoscopic instruments is more important as it holds future for all surgical procedures.

Endoscopy being an advanced tool in the present era in the field of diagnosing and treating various surgery, ENT, Gynecology disorders sheds more scope in the field of surgery as it is capable of converting minimal invasive

surgery into least invasive surgeries. Aim of reducing surgical mobility and mortality by helping early diagnosis and treatment. An Ayurvedic surgeon there is need to improve and apply Sushruta concept of Nadi Yantra in our practice in a way that is acceptable as per present day.

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