

The Glory of Indian Medical System During Vedic Period and Subsequently and the Surgical Procedures (Shalya Chikitsa) Developed Thereon by the Exponents

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Abstract: In Ancient India during Vedic Period and subsequently, the Ancient India Culture has given more importance to the health of the people as the primary objective of any ruler and they firmly believed that “Health is wealth and a Healthy Nation is Wealthy Nation”. The traditional Indian Medicinal tools can be traced to Vedic Period and are supposed to be more than 5000 years old. A glimpse of the Vedas especially Atharvaveda, a prime source of health and healthcare procedures derived and developed by Ancient Maharshi’s and subsequently the Great Acharyas like Sushrut, Charaka, Agnivesya and other so many luminaries that are in use when the other part of the world is in dark. The real meaning of history of medicine is the study and documentation of the evolution of healthcare procedures, identifying the medicinal properties of many herbs and plants that the nature has gifted to the mankind, acquiring knowledge over a period of time is the order of the day. Of the four Vedas, Atharvaveda mainly deals with the health and health related topics, the Ancient Acharyas/Maharshi’s too developed Ancient Indian Medical System and treat the diseases/ailments they have also adopted procedure in addition to the medical system and also the mantras that are drawn from the Vedas to appease some of the gods for

curing purpose (as the Ancient Indians believed some gods are responsible for creating unhappy and unpleasant situations in the forms of diseases/ailments to the human beings) like, Rudra, Agni, Varuna, Indra and Maruthi are designated as Celestial Physicians. Like other branches of science, the Ancient Indian System of Medical Science (Vaidyamu Chikitsa) is a well-defined conceptual framework and is embedded in

the Vedas and benefiting the mankind. In Ancient India, the Vaidya’s or Maharshi’s or Acharyas never used to treat any disease on the basis of visible symptoms on the body but they used to treat the patient by identifying the root cause of the symptoms and that the root cause of symptoms are addressed to eradicate diseases.

To mention the notable personalities of Ancient Indian Medical System, Charaka and Samhita, who wrote two books on Indian System of Medicine derived from the Vedas and are known as Charaka Samhita and Sushruta Samhita. Of these two luminaries Acharya Sushrut in his treatise Sushruta Samhita categorically described Shalya Chikitsa (Surgery) and is properly known as the “Father of Surgery”.

“Shalya Chikitsa (Surgery) is that branch of Chikitsa (medicine) that deals with the physical manipulation of a bodily structure

to diagnose, prevent or cure an ailment/disorder”

Surgery means,

“To eliminate that which is superfluous, restored that which has been dislocated, separate that which has been united, joined that which has been divided and repaired the defects of nature”.

In the words of Ambroise, a french Surgeon, In this article an attempt is made to bring out the glimpses of, that historical developments in Shalya Chikitsa (Surgery), the procedures, the development of Yantras (instruments) and their application are all described to the extent possible. So that the glorious days of the Ancient Medical System and surgery can be brought to the fore.

Keywords: *Shalya Chikitsa, Poorva Tantra, Sutrasthana, Nidana, Sarirasthana, Chikitsasthana, Kalpasthana, Uttara Tantra, Organ Transplantation and Plastic Surgery, Genetic Engineering, Niruddhaprakasha (Stricture of the Urethra)*

I. Introduction:

“Pranayamaat Pustihi Gotrasya Stejo
Yashobalam”

The meaning of the above caption is “with Pranayama body gets strength, vigor and concentration”. If these things are developed by Pranayama the diseases or ailments are afraid of coming nearer to you.

Drussena Saradaam Satam
Sunyama Saradaam Satam
Prabavama Saradaam Satam
Adhinaa Syama Saradaah Satam
Bhuyama Saradaah Satam

Means,

"One has to live for Hundred years" How?
With good habits like See Good, Hear Good,
Speak Good and Live with Integrity
“A healthy body is the dweller of sound
mind”

According to World Health Organization (WHO), it is a

"State of complete physical, mental and social well-being

and not merely the absence of disease or infirmity"

The Ancient Indian Culture has given more importance to the Health of the People because they firmly believed that “Health is wealth and a Healthy Nation is wealthy Nation”. The traditional Indian Medicine roots can be traced to Vedic Period and are supposed to be more than 5000 years. A glimpse at the Vedas, will identify information both practical and scientific covering majority of the subjects that are useful to the humanity/mankind. Some of the notable subjects that found prominence in Vedas and are useful to the mankind in their day-to-day life are, health, philosophy, engineering, astrology and so on.

The real meaning of history of medicine is, the study and documentation of the evolution of healthcare procedures, practices and acquiring knowledge over a period of time. In Ancient India, during Vedic Period, when there is a lack of written sources of medicine, this information of health and health procedures are drawn from archaeological sources. This source of information includes the evolution of the human society’s approach to health and health procedures, illness and injuries etc. It is during the period of Vedas written by the great Maharshi’s, the first Indian text dealing in Chikitsa (medicine) is drawn in the Public Interest wherein the description of various herbs that are used to cure various ailments/diseases are recorded in Atharvanaveda. This is the concept later became the foundation stone for Ayurveda, the one branch of medicine. Ayurveda means “complete knowledge for long life”, As everybody knows there are four Vedas namely Yajurveda, Atharvanaveda, Samaveda and Rigveda. Of these four Vedas

Atharvanaveda mainly deals with the health and health related topics. The Vedas have a detailed comprehensive information regarding the diseases that are prevalent in those days and their treatment by using medicinal herbs and also the characteristics of herbal medicines their usage, procurement and nourishing; in addition Vedas also mentions about the efficiency of the medicinal herbs and their application to treat the diseases by removing the ailments make the human beings healthier and to conquer the diseases.

A. In addition to the above, the Vedas also mentioned in the form of Mantras to appease some of the gods for curing purpose like, “Rudra, Agni, Varuna, Indra and Maruthi” and are designated as Celestial Physicians.

B. Like other branches of Science, Ancient Indian System of Vaidyamu Chikitsa (Medical Science) is a well defined conceptual framework and is embedded in the Vedas and benefiting the mankind. The important aspect of Vaidyamu Chikitsa (Ancient Medical System), the Vaidyars in those days never use to treat any disease on the basis of visible symptoms on the body, but they used to treat the patient by identifying the root cause of the symptoms and that root cause of symptoms are addressed to eradicate the disease.

C. Of all the four Vedas mentioned above, Atharvaveda is mainly deals with Vaidyamu Chikitsa (Medical Science), diseases, application of herbal medicines and the procedure to cure any ailment/disease. Atharvaveda consists of 114 hymns related to Vaidyamu Chikitsa (Medical Science). Ayurveda which is predominant in Ancient India as Vaidyamu Chikitsa (Medical Science) is supposed to be the Upaveda of Atharvaveda/Panchama Veda.

Atharvaveda also contains 731 hymns, charms and incantations (chanting). The puranas Dhanvantari appeared in this World at the time of Samudra Mathana (Ksheera

Atharvaveda VIII, 7 appears as a charm bestowing longevity, the divine-ties to whom it is addressed are the herbs mentioned in hymns. It also explains the use of hymns a remedial measure against diseases.

D. The main source of knowledge with respect to Indian Medical System are the four Vedas (Rig, Sama, Yajusa, Atharva veda) notably Atharvaveda contains full of hymns and prayers indicating the ways and means to protect people from diseases and natural disasters.

These things are evident from the Yajurveda wherein we can observe that,

“Physical and mental ingredients of Positive Health were a genuine concern of people in the Vedic period – it means the World should be free from diseases and should have healthy mind”.

Sushruta Samhita written by the Great Acharya Sushruta and the Upanishads are also source of information about different parts of the body that are visible and invisible (internal and external), the ailments/diseases, the causes thereon, procedures to treat them and food habits that are to be followed in accordance with the treatment.

E. Sushruta mentioned in his Samhita about Dhanvantari as,

“It was I Who Cured the disease of the Gods and prevented their deaths and decrepitude. I have now come this World to teach Salya Tantra and other divisions of Ayurveda in detail”

God Dhanvantari as all the Ayurvedic Doctors will offer prayers before any procedures is the pioneer of Ayurvedic Science, his birthday is celebrated in the month of “Karthika” all over the country. Though the name of Dhanvantari as the incarnation of Lord Vishnu is not found in Vedas but many Puranas narrate this subject of Dhanvantari and according to some Sagara Mathanam). There is a conflict of stories regarding Dhanvantari one is the

mythological fact as mentioned above and the other one is Kasiraj Devodasa Dhanvantari was born at Kasi and was an eminent Surgeon and Specialist and Advisor of Sushruta.

Dhanvantari considered to be the incarnation of Lord Vishnu. According to Puranas/Mythology, “Lord of Ayurvedic healing, holds a golden leech (symbol of blood purification) and a medicinal plant in his right hand, and the Crown of Wisdom and Pot of rejuvenating Nectar. The Tulasi Seed mala around his neck, Plant – With Halo and his blue tinted skin emphasize his connection with Vishnu”. It is a considered known fact that Dhanvantari was the early Indian Practitioner and one of the World’s First Surgeon known in the healthcare. Lord Dhanvantari perfected many herbal medicines and natural remedies, it cure many ailments/diseases and he is credited with the discovery of the antiseptic properties of Turmeric. In addition he also discovered the preservative properties of Salt. Dhanvantari’s brilliance and knowledge of medicinal values of the many of the herbs that he discovered and his procedures in curing ailments/diseases is considered to be one of the Nine Gems. As an authority on healthcare in the Court of King Vikramaditya.

In Vedic Period “Ashwinis” were expert medical practitioners and in Puranic period Dhanvantari became the same as Ashwini’s. Though Dhanvantari was master of all branches of Ayurveda and eminent toxicologist was also well known physician of horses (Ashwayurveda) and elephants (Hastyayurveda). With all his eminence Dhanvantari developed eight branches of Ayurveda in his life time including surgery and became an exponent of surgery and finally it is to be known as “Salya Sampradaya”. (Dr. Deena Bhandu Moharana, Orissa Ayurveda Seba Sadan, Cuttack).

II. Principles and Procedures to Be Adopted in Shalya Chikitsa (Surgery) Advocated By Acharya Sushruta:

Acharya Sushruta also mentioned the principles and procedure of, “Traction, manipulation, apposition, stabilization and post operative physiotherapy”

2. Acharya Sushruta also invented and prescribed certain procedures to induce, “Growth of lost hair and removal of unwanted hair”

3. Acharya Sushruta also advocated that the Surgeons should adhere to, till they achieve, “Perfect healing which is characterized by the absence of any elevation, induration, swelling mass and the return of normal colouring”.

III. Development of Medical Sciences During Vedic Period

As already mentioned above the ancient Medical System is derived from the Vedas mainly Atharvaveda and Yajurveda.



Atreya
Agnivesya

(Under the guidance of Ancient Physician Atreya Agnivesya composed Encyclopedic Medical Compendium known as Agnivesya Samhita)



Charaka

(Agnivesya Samhita was revised by Charaka and renamed it as Charaka Samhita)



Vradhabala

(Charaka Samhita was supplemented adding 17 chapters by Vradhabala and retaining the name of Charaka Samhita)

Over a period of time Indian Medical Science in *Vedic Period* has emerged into two major school of thoughts; namely

1. *Athreya Parampara*
2. *Dhanvantari Parampara*

1. Athreya Parampara: This School of thought namely Athreya Parampara was mainly “*Sampradaya of Surgeons*” related to “*Shalya Chikitsa*”.

Agnivesha under the guidance of the Ancient Physician “*Maharshi Atreya*”, “*composed an encyclopedic medical compendium*”. In the 18th Century, B.C.E., called, “*The Agnivesha Samhita*” . However, this Agnivesha Samhita of Acharya Agnivesha has not received that much attention that it deserves. However, in the latter period this Agnivesha Samhita was revised by Charaka and renamed it as “*Charaka Samhita*”. Subsequently at a later stage this Charaka Samhita was supplemented with additional seventeen chapters that are being added by Acharya Vradhabala, without changing the name of Charaka Samhita which is predominantly acclaimed by one and all in Ancient Indian Medical Form.

2. “*Dhanvantari School of Thought*” is concerned, it is more related to

medicines/body treatment and mainly the work of a physician. Over a period of time two Eminent Scholars “*Charaka*” & “*Sushruta*” emerged as “*Notable persons*” in “*Indian System of Medical Science*” and developed a systematic way treating ailments of the patients in two different ways. Of these notable persons, “*Sushrut*”, the other eminent personality wrote a book called “*Sushruta Samhita*” mainly deals with “*Shalya Chikitsa(Surgery)*” and became the authority on “*Shalya Chikitsa(Surgery)*” in Ancient India.

IV. Aim and Objectives:

The Aim and objective of this study is the glory of Indian Medical System during Vedic Period and subsequently and the Shalya Chikitsa (surgical procedures) developed thereon by the exponents.

V. Literature Review and Discussion:

Sushruta Samhita written by Sushruta, in the 6th century B.C.E. who is one of the Ancient

Surgeons who developed Surgical Procedures and also instruments that are needed for the same.

Sushruta Samhita consists of

a. Poorva Tantra

b. Uttara Tantra.

A. Poorva Tantra is sub-divided into five books namely (a) Sutrasthana, (b) Nidana, (c) Sarirasthana, (d) Chikitsasthana and (e) Kalpasthana and these five books contain 120 chapters. Again Sushruta Samhita, the healing arts were divided into five parts and that includes (a) Rogaharas (physicians), (b) Salya Haras (surgeons), (c) Vishaharas (poison healers), (d) Krityaharas (demon doctors) and (e) Bishagandarvas (magic doctors) Sutrasthana mainly deals with basic medical science and pharmacology; Nidana deals with disease processes; Chikitsasthanam containing 34 chapters on surgical procedures and Post operative management; Kalpasthanam containing eight chapters deals with toxicology; Sushruta firmly believed that one can only be a skillful surgeon provided he masters the subject on Anatomy. Sarirasthana containing 10 chapters mainly describes Human Anatomy, Embryology and techniques of Dissection.

Acharya Sushruta in his famous book Sushruta Samhita mentions that, *“the different parts or members of the body including the skin, cannot be correctly described by one who is not well versed in anatomy. Anyone desires of acquiring a thorough knowledge of anatomy should prepare a dead body and carefully observe, by dissecting it examine its different parts”* [Tasmāt nihsamsaym jnanam harta salyasya vanchata / Sodhayitva mrtam samyag drastavyah angavini-ccayah// Pratyaksatah Health Insurance yat drstam sastra-drstam ca yat bhavet/ Samasatah tat ubhayam bhuyah jnana-vivardhanam// (Chattopadhyaya, 1933)]

In Ancient India, especially during Vedic Period and subsequently there is a strong belief among Hindus that the dead body cannot be dissected and it should be given Hon’ble Cremation as it is.

In such situations where belief of Sastras are predominantly in force, Sushruta is able to bypass these obstrucles to acquire knowledge of Anatomy by using Brush-type-Broom which scraped off the skin and flesh without using any dissector so that the dead body need not be cut. Sushruta with his acumen knowledge and concentration able to identify 300 bones, joints, ligaments and muscles from various spots of the human body (Hoemle 1907). Though there is a controversy regarding number of bones of human body is largely due to the Cadavers that Sushruta observed. However in those Ancient days where nothing is available like today’s modern equipment. Acharya Sushruta is able to offer indepth understanding of the various parts of the body and their function, that is far more better than the present knowledge acquired by the present generation with latest equipment. This Sushruta Samhita written in Sanskrit was later translated into Latin, German and English. Acharya Sushruta, the eminent Ancient Surgeon believed that, to be an eminent and skillful Surgeon, one must be an Anatomist. *Sarira Shastra* which is the part of Sushruta Samhita contains 10 chapters illustrating the study of human anatomy.

B. Uttara Tantra:

Acharya Sushruta in the Sushruta Samhita, the important topics that the Acharya has narrated some importance was given on Uttara Tantra. Sushruta Samhita mainly deals with Shalya Chikitsa (Surgical Procedures) in addition Ophthalmology, ENT, Gynecology, Obsterics, Pediatrics, Agad Tantra, Tantra Yukti etc. The observations made about Uttara Tantra are true and relevant today even. As we see the

Sushruta Samhita, the procedure described in Ophthalmology for removal of cataracts is being followed by the present surgeons which the Acharya described 4000 years ago. Acharya Sushruta also elaborately described about Dhincharya (daily routine especially in day time), Ratricharya (advice to be followed during night), Ruthucharya (seasonal behaviours). In addition Acharya also mentions how to take medicine and when to take it to cure a particular disease are so unique that they are unparalleled speciality of Uttara Tantra. Acharya also mentions in Uttara Tantra of Sushruta Samhita about taking food and water how, when, how much. In addition, the concept of Agni and the applicability of seasonal regimen in the non-monsoon countries is to be mentioned specifically because it shows the Acharya's acumen in understanding the function of the body and how it has to be treated seasonally regarding Tantra Yukti, "it is a key to open the secrecy of the meaning of the Sushruta samhita. Tantra Yukti makes a person easy to understand and digest the exact meaning of Sushruta Samhita". Acharya also made it a point that similar symptoms are present in different diseases/ailments but some symptoms are different from others in every disease and Acharya Sushruta is able to distinguish/identify such symptoms that separates one disease to another and it is a such important aspect that Acharya Sushruta recognized and taught to the Shishyas so that no Acharya or any person dealing in medicines can ignore. In spite of such advancement in medicine and medical technology in the present system of Allopathy, the healthcare professionals is to misjudge such systems and thus giving unwanted, unwarranted treatment to the patients for example, chest pain occurring in heart disease and in indigestion are same making the healthcare professionals now misjudging one for other. On the other hand,

Acharya so elaborately described in Uttara Tantra of Sushruta Samhita not even IOTA of misleading or misguiding or misjudgment does not occur. That means the Acharya described every symptom of a disease/ailment so meticulously that the chances of misjudging of any disease by observing the symptoms is remote.

In another example the modern Allopathy literature describes on ENT but the same was elaborately described in Uttara Tantra of Sushruta Samhita in 26 chapters that includes diseases in head

In concluding 19th chapter Nayanabhighat - Pratisedham, Sushruta stresses the significance of holistic approach necessary in the entire field of treatment. He says:

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 U.19/20

However, there is another thought about some scholars who have done extensive research on Uttara Tantra found some material support that Charaka Samhita also contains Uttara Tantra and is known as "Charaka Uttara Tantra". I quote a relevant note from "a review through Charaka Uttara – Tantra" authored by Richa Viswakarma Pradeep Kumar Goswami, Junior Resident, Associate Professor and Head of the Department of Samhita and Sanskrit, Faculty of Ayurveda, Institute of Medical Sciences, Banaras Hindu University, Varanasi,

"In the present scenario the available additions of Charaka Samhita contain Eight Sthanas only. Charaka Samhita does not contain Uttara – Tantra like Sushruta Samhita and Samhitas of Vagabhatta. On contrary in the twelfth chapter of Siddhi Sthana, Charaka has mentioned about Uttara-Tantra of Charaka Samhita. Many

contraversories raised on the existence and recognition of Uttara Tantra of Charaka Samhita. After a thorough study and scanning of available literature, it is concluded that, Charaka Uttara Tantra was existing upto the time of Nishchalakara (13th century AD). Nishchalakara has quoted *number of references in Ratna Prabha, which are from Uttara Tantra of Charaka Samhita*”.

I acknowledge and express my sincere thanks for the valuable information taken from the above work of the two great scholars who have done yeoman service.

Uttara Tantra itself is a subject of great importance in Ancient Indian Healthcare during Vedic Period and subsequently I made an attempt to bring out the gist of the subject.

What is Surgery?

“Shalya Chikitsa (Surgery) is that branch of Chikitsa (Medicine) that deals with the physical manipulation of a bodily structure to diagnose, prevent or cure an ailment/disorder”

Ambroise Pare, a 16th century French Surgeon stated that, Surgery means

“To eliminate that which is superfluous, restored that which has been dislocated, separate that which has been united, joint that which has been divided and repaired the defects of nature.”

In ancient India especially in vedic period and subsequently and during Acharya Sushruta period, Acharya developed, “How to make and handle tools, they have employed their talent to develop surgical techniques, each time more sophisticated than earlier”.

During Surgery, the three main problems that arises are bleeding, pain and infection that are all controlled by under the guidance of Acharya Sushruta with his unique functions and procedures of the equipment

that were developed in those days. A landmark invention being, use of wine, as an anesthesia material to bring the patient to subconscious state during Shalya Chikitsa (surgery).

These two books namely “Charaka Samhita” & “Sushruta Samhita” are the first and the most ancient works in the field of Indian Medical System and regarded as the greatest treatise in the field of Indian Medical System.

As already mentioned above, “Sushrut Samhita” narrates about different principles and theories on “Shalya Chikitsa (Surgery)”. It is not surprising in those days to mention that “Sushrut” developed more than 100 types of Surgical Instruments (Shalya Chikitsa Parikaram) that includes scalpels, Scissors, Forceps, and Specula.

Acharya Sushruta Born to Sage Vishwamitra

History reveals that Acharya Sushruta the most acclaimed Ancient Surgeon to the Ancient India has himself developed many Shalya Chikitsa Parikaram (Surgical Instruments), without any sophisticated equipment but are almost in line with the present surgical equipment/instruments in their functionality. It was acclaimed by many that Sushruta is called as “Father of Surgery” and a Surgeon of Par Excellence and who wrote Sushruta Samhita on Surgery and in which Acharya Sushruta has described over 300 Surgical Procedures and around 120 main surgical instruments (all Acharyas own inventions). Acharya Sushruta also classified Surgical Procedures into Eight categories for better understanding of the Surgical Procedures.

Acharya Sushruta is so authoritative on the subject, “He has described every form of Surgery – from bones to tissues to various Organs as well. Acharya also described the symptoms of diseases and offered prognosis for the same.”

History discloses that his works were translated and reached the Arab World and from where it was done spread to Europe.

It is surprising to note that Acharya Sushruta, “made use of Ant Heads to hold skin together when stitching and substituted what we know as Anesthesia with wine”

Some of the instruments developed and their utility are also discussed below. The literature that is available on this subject brought out the uniqueness of the Surgical equipment manufactured in those days because their uniqueness and no such instruments are available prior to them, and that is why Acharya Sushruta is deemed to be the first surgeon in the world who presented such valuable surgical equipment/instruments that includes endoscopes.

As we Indians with authority can say regarding Surgical procedures in Ancient India especially during the period of Acharya Sushruta,

“Sushruta took surgery in medieval India to admirable heights and that era was later regarded as ‘Golden Age of Surgery’ in the Ancient India”

The genius of Acharya Sushruta prompted Eminent Surgeon Allenwhippel to declare,

“All in all Sushruta must be considered the greatest Surgeon of the Pre-Medieval Period”.

Has already mentioned above Acharya Sushruta, the father of Indian Surgery was a disciple of “Dhanvantari Sampradaya” which is considered to be Ancient Indian Era of Surgical School. The book Sushruta Samhita written by the Great Ancient Indian Surgeon also wrote an authentic book of

“Shalya –tantra” that narrates the surgical training in its 9th chapter of Sushruta Samhita/Yogya Sutriya Adhyaya. This clearly shown that Yogya in the present day is qualification.

Sir Astley Cooper president of the Royal College of Surgeons, said that,

“Without dissection there can be no anatomy, and that anatomy is our polar star, for without anatomy a surgeon can do nothing, certainly nothing well” In Ancient India, the Surgeons used to practice one type of surgery to a particular disease that means they used to specialize in that form of surgery that can be compared to the present system of specialists like Ortho, Diabetic, Skin, Eye etc. On the contrary Acharya Sushruta the eminent surgeon of Ancient India, who is the author of Sushruta Samhita used to treat numerous diseases through surgery, para surgical procedures and also conservative therapy. According to Acharya Sushruta,

“Hand is the best or superior most instrument”

It means whatever may be the instrument that we make use during surgery unless the surgeon’s hands are perfect, well trained and active, the Surgery is not successful and the instruments that are being used are subsidiary to the hands.

VI. Techniques and instruments developed and widely used for Shalya Chikitsa (Surgery):

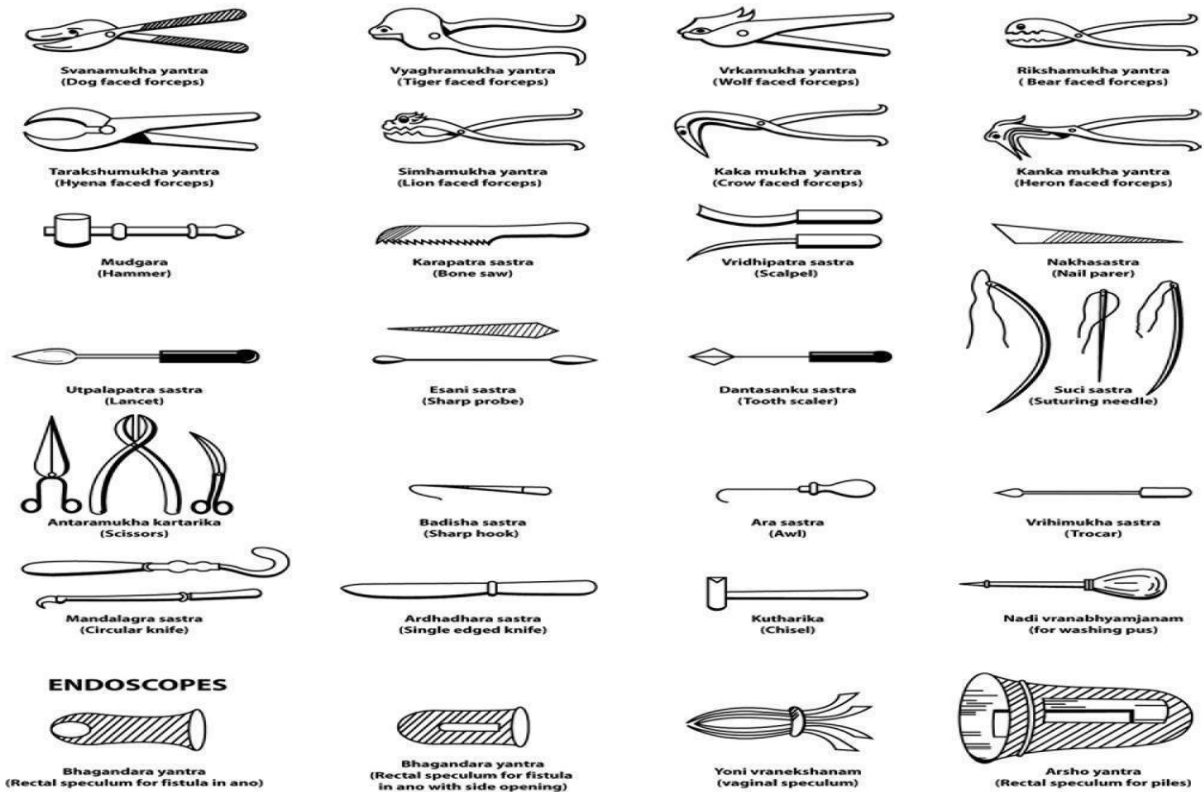


Fig. 1 Pictures of some of the instruments including endoscopes [12].

Source:

https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3452414/pdf/12262_2008_Article_63.pdf

A look at the Sushruta Samhita in the chapter Surgical treatise, discloses that it is divided into six sections describing in each section the various branches of surgery, that includes, military medicine, medical ethics, thinking method, dissection of human body, dissection practices and operative surgical exercises on vegetables etc., for the beginners. Sushruta Samhita discloses in one full chapter (IX of Section 1) is mainly devoted two principles of experimental surgery, and Chapter VII and VIII of section 1 mentions a detailed description of 121 types of Surgical Instruments and are classified into two main groups comprising 101 blunt and 20 sharp instruments.

A. Classification of Instruments:

Acharya Sushruta derived the knowledge from Atharvaveda propounded by Maharshis in Vedas developed unusual instruments (Yantras), neither seen nor used before for Shalya Chikitsa (Surgery) to be used for external and internal parts of the body to ward of the diseases/ailments of the body that cannot be cured through medicine or medicinal applications.

1. Blunt instruments (yantras): (Sanskrit name given in parenthesis)

a. Cruciform instruments (Svastika yantras)

- b. Dissecting forceps or tongs (Sandansha yantras) 2
- c. Spoon shaped instruments (Tala yantras)
- d. Tubular instruments (Nadi yantras) 20
- e. Rod like instruments (Shalaka yantras) 28
- f. Accessory instruments (Upa yantras) 25
- g. Sharp instruments (sastras) 20

Total number of instruments 121

Acharya Susruta always emphasized that the surgeon should be well versed not only with the use of instruments, on where, when and how but also the nature of the instruments, its utility part and to what extent the instrument is useful and in which circumstances for this according to Acharya Susruta the healthcare professionals should use them on the patients under the guidance of the Acharya who is par excellent in that field.

Some of the instruments are described hereunder:

1. Svastika yantras (Cruciform instruments):

These Svastika yantras (forceps) are divided into twenty four sub classes in different shapes and are being used to extract thorn or foreign bodies embedded in bones from the humans.

2. Sandansha yantras (Dissecting forceps or tongs): The Sandansha yantras are divided into two types and with or without locks and are used for extracting foreign bodies from skin, muscles, blood vessels and ligaments of a patient.

3. Tala yantras (Spoon shaped instruments):

This type of instruments are used for extracting foreign bodies from the ear, nose or sinus of a patient.

4. Nadi yantras (Tubular instruments):

This Nadi yantras having different shapes and varieties, are mainly used to remove

foreign bodies and to inspect and treat the disease spots that are observed externally on the patients body. These instruments that are in different shapes and sizes so that they can penetrate to the different parts of the body and one such instrument is the present endoscope. This particular instrument (Tubular instrument) is used in piles, fi stula in ano, anal stenosis etc.

The arsho yantra (rectal speculum for piles), bhagandara yantra (rectal speculum for fi stula in ano) and yoni vranekshanam (vaginal speculum) are some of the examples of endoscopes for external examination that cannot be observed with naked eye.

1. Chalaka Yantra (Rod like instruments)

Instruments that are used for internal parts of the body that a naked eye cannot make out. There are two types of Instruments/Yantras that Sushruta developed for Shalya Chikitsa

2. Upa Yantras (Accessory instruments).

These Upa Yantras that are used in Ancient India by Susrutha and other Acharyas are, rope, intertwined thread, bandages, leather straps, bark, creeper, linen cloth, round pebble, stone, hammer, palm and sole, fi nger, tongue, teeth, nail, mouth, hair, ring of a horse's bridle, twig of a tree, spittoon, evacuating, exhilaration, magnetic stone, caustic, fi re cautery and drugs".

3. Sastras (Sharp Instruments):

Depending upon their size, usage, handling they are classified into twenty

1. Mandalagra sastra (Circular knife)
2. Karapatra (Bone saw)
3. Vrddhipatra (Scalpel)
4. Nakhasastra (Nail parer)
5. Mudrika (Ring knife)
6. Utpalapatra (Lancet)
7. Ardhadhara (Single edged knife)
8. Suci sastra (Suturing needle)
9. Kusapatra (Bistoury)
10. Atimukha (Hawk bill scissors)

11. Sararimukha (Scissors)
12. Amtaramukha (Curved bistoury)
13. Trikarcaka (Three edged knife)
14. Kutharika (Chisel)
15. Vrihimukha (Trocar)
16. Ara (Awl)
17. Vetasapatraka (Scalpel of different type)
18. Badisa (Sharp hook)
19. Dantasanku (Tooth scaler)

20. Esani sastra (Sharp probe)

B. In Sushruta Samhita, in the chapters, “Sutrasthana, Yogya Sutriya Adhyaya”, he describes enhancing skill techniques and how to become a scholar in Shalya in perfectly executing the Surgery. Acharya Sushruta also describes eight types of Sastra Karma that are being used in Surgery are,

Sl.No.	Type of Procedure	Procedure	Instruments used	Type of diseases
1	Chhedhana (Excision)	For trainies this procedure was demonstrated on different fruits with different shapes, that makes the student how to hold the instrument, how to make use of it and selection of instrument for particular type of disease.	Mandalagra, Karapatra, Vrdhi patra etc.	Chhedhya rogas
2	Bhedhana (Incision)	In this procedure the student is trained with the help of leather bag, urinary bladder of dead animals and leather bottles etc filled with water and mud.	Vrddhipatra, Nakha Sastra, Mudrika, Utpalapatraka and Ardhadhara	Bhedhya rogas like Granthi (Cyst), Vriddhi (scrotal enlargements), Prameha pidaka (Carbuncles), etc.
3	Lekhana (Scraping)	Lekhana is practiced on piece of hairy skin treat the conditions like Vitiligo, Ulcer margins, Keloid, Hypertrophied muscle, Cyst, Patches of skin, etc.	Mandalagra and Karapatra etc.	Skin diseases like Vitiligo, Ulcer margins, Keloid, Hypertrophied muscle, Cyst, Patches of skin, etc.
4	Vyadhana (Puncturing)	This procedure can be practiced by using with veins of animals or Lotus stalk	Kutharika Shastra.	
5	Siravyadha (Ardha chikitsa in Shalya tantra)	For this procedure Veins of animals and Lotus stalk are used because veings of animals are like veins of humans. Acharya Sushruta also mentions that while puncturing in muscular areas	Kutharika Shastra.	

		it should be the size of a Yava (barley grain) and in other areas the puncturing should be “½ of Yava or one Vrihi (rice) using a Vrihimukha Shastra”. For this procedure in the beginning it should be adopted on the objects like Lotus Stalk and animals veins that gives an idea of depth and penetration of the puncture and handling of the instrument and pressure to be applied on the veins.		
6	Eshana karma (probing)	This procedure can be practiced on Moth-eaten wood, tube of bamboo and reed, and mouth of dried bottle gourd because these objects have multiple holes or pores and are hollow inside.		Kshara sutra management for Fistula in Ano and Pilonidal sinus
7	Aharana Karma (Extraction)	This procedure adopted is to remove foreign bodies by pulling and initially it is being applied on fruits having seeds and also on teeth of dead animals.		Removal of foreign bodies like stones, Faecolith, etc from the internal sections of the body.
8	Visravana Karma (Drainage)	This procedure is used to remove the abnormal collection of fluid in body cavities	Bee wax coated Salmali wood	Abscess, Cysts, Spongy gums, etc
9	Seevana (Suturing)	Initially it should be practiced suturing of two edges of fine and thick cloth and on the borders of leather; means it close the wound either due to surgical procedure or in some other way to close the edges and doing them together for speedy recovery.		(Medas, Bhinna vrana, Saddyo vrana), wounds over the movable joints, etc.
10	Bandhana karma	This procedure is clearly described in Sushrua		To close the wounds during

	(Bandaging)	Samhita and there are 14 ways of doing it (Vrana bandhana). Different types of bandhanas are used for different wounds and practiced on different parts of the dummies made up of cloth.		surgical procedures and also wounds caused otherwise.
11	Kshara karma and Agni karma	It is a para surgical procedure in Ayurveda and this two procedures are to be scarcely used on selective points of the body otherwise they will create infections.		Which are used to treat numerous diseases without recurrence.
12	Yogyasutriya/ Karna-sandhi Bandhana,	For this it should be practiced initially using soft skin muscles and hollow stalk of Lily Plant		Fabricating ear, joining severed ear and bandaging.
13	Vasti karma, Vrana prakshalana	For this procedure it should be practiced on the side wall of an earthen pot filled with water or on the mouth of gourd.		

Acharya Sushruta is so humble in nature, that he used to acknowledge in every chapter of the book Sushruta Samhita stating that,

“I am going to explain this chapter as propounded by Lord Dhanwantari’

As the Acharya wants every student who practices Lord Dhanwantari Sampradaya, in his Yoga Sutriya in the first sloka explains that,

“even having studied the entire scripture should be subjected to practical work, he

should also be given instruction on the way of practice in Sneha, Vamana, Virechana, etc. or eight surgical operations”

Acharya used to strongly feel that any person having acquired great learning and knowledge in Shalya Chikitsa (Surgery), will be of no use to be a surgeon if he has not done any practical work and that, Acharya is very particular that one who wants to be a surgeon should have practical knowledge and that is why he adopted the procedures of practicing on vegetables that are similar in their nature with the organs of the human body. It is nothing but the present stimulation learning techniques

VII. Application and use of Yantras (Surgical equipments) that are developed by Acharya Sushruta and their use:

Sl. No.	Sastras	Usage of Sastras in surgical operations
1	Mandalagra sastra (Circular knife)	used for Excision and Scrapping.

2	Karapatra (Bone saw)	
3	Vrddhipatra (Scalpel)	used for Incision and Excision.
4	Nakhasastra (Nail parer)	
5	Mudrika (Ring knife)	
6	Utpalapatra (Lancet)	
7	Ardhadhara (Single edged knife)	
8	Suci sastra (Suturing needle)	used for drainage, puncturing and suturing
9	Kusapatra (Bistoury)	used for Drainage
10	Atimukha (Hawk bill scissors)	
11	Sararimukha (Scissors)	
12	Amtaramukha (Curved bistoury)	
13	Trikurcaka (Three edged knife)	
14	Kutharika (Chisel)	used for puncturing
15	Vrihimukha (Trocar)	
16	Ara (Awl)	
17	Vetasapatraka (Scalpel of different type)	
18	Badisa (Sharp hook)	used for extraction of foreign bodies
19	Dantasanku (Tooth scaler)	
20	Esani sastra (Sharp probe)	used for probing and as a director

Acharya Sushruta who developed such extraordinary surgical instruments mentioned above, also described the method of extraction of foreign body by using a substance made of lack from the throat with the help of a treated Iron Rod or a Tube of copper or such other material that is very stiff.

VIII. Acharya Sushrut's knowledge - anatomy, physiology, etiology, embryology, digestion, metabolism, genetics and immunity

Acharya Sushruta emphasized on cleanliness of the atmosphere and sterilization of the instruments before and after surgery and how to perform those functions and are far more superior than the present sterilization. Acharya Sushruta also

expertised to make the “patient senseless”, to say that is Anesthetic, to help in operations or surgeries. He is an exponent of general surgery in those days and propounded a procedure in “Trauma cases”

and six types of injuries that are generally identified on all parts of the body and

Acharya Sushruta is to treat twelve types of fractures and six types of dislocations, including amputations and principles of fraction, manipulation and post operative physio therapy (Rehabilitation).

Sushruta Samhita also mentions the surgical procedure to remove “harmful tissues or elements born out of what would be Cancer in such organs”.

a. Acharya Sushruta also describes, while explaining Hridaya,

“Pranavayu was associated with blood cleaning and acceptance of the Rasa – Rakta complex in the heart (Aadaan), Valve closure and generating Prasapand (Cardiac impulse). Pranavayu brought amber-piyush (Oxygen) with every inspiration and Udayanavayu provided Bala (energy) to Cardiac Muscles. The later was accountable for the force required to propel and circulate (Vyana), the Rasa – Rakta complex along

the Mahadhamanee (Aorta). Defects of Pranavayu. Defects of Pranavayu and Udanavayu could result in enlargement or failing of heart”.

It is not surprising to note, the mentioning of Acharya Sushruta, in the Samhita regarding, “Mandala Sandhis (the Valves) that controlled the Uni directional flow of Rasa-Rakta complex in and out of the Hridaya (Heart). In Amavataa (Arteries) valves would become effected. The Vyanavayu controlled the rhythmicity of the Hridaya as well as contraction and relaxation. Vyanavayu was considered responsible for the circulation of Rasa-Rakta complex from the heart to the body along three directions i.e. upwards (heart to head and back) horizontally (portal circulation) and downwards (peripheral circulation). Samanavayu indirectly influenced the heart by bringing the nutritive fluid from digestive tract to the heart. On other hand where as Sadhaka Pitta could effect rhythmic control of the heart, the Avalambaka Kapha accounted for lubrication and could now considered to be associated with Peri Cordial Effusion, plural affusion and pulmonary edema”.

The above narration brought out from different writings of eminent people based on Acharya Sushruta Samhita shows that, “the contribution of Ancient Indians in Medical Systems that is unparalleled in those days in the rest of the world and with authority we can say that it is foundation and torch bearer to the present system of so called Allopathy that was proudly mentioned by Western World as if it is a new invention”.

B. Anatomy in Ancient India – Sushruta Samhita: Knowledge about anatomy is not a new subject nor knowledge to the Acharyas and Rishis of Vedic Period in Ancient India. Those Acharyas and Rishis acquired the science of anatomy (body science) by sacrificing animals and observing the

internal body parts thoroughly and also, a chance observation of improperly buried human bodies in addition by observing the patients suffering with various diseases/ailments, while treating them. At a nutshell, the knowledge is acquired about the anatomy of the human body is by observation (time tested) and the improvements that are observed during treatment and at times the negative progress caused with the application of the medicinal herbs and the natural decay of the body parts by virtue of age or decay due to malfunctioning. All these observations are put into two books known as Charaka Samhita and Sushruta Samhita by the two noble personalities, who are authority in Ancient India, one is an authority in treatment and procedure and the other is in surgery namely Sushruta and Charaka. The present medical information/knowledge and its principles are derived from such ancient knowledge and principles only. In Ancient India, the medical science is called as Vaidya Sastra and the physicians are used to called as Vaidya (men with medicinal knowledge).

The Ayurveda which is also known as Upaveda/Panchamaveda consists of eight parts (Astranga), a. Salya (major surgery) b. Salakya (minor surgery), c. Kaya Chikitsa (treatment of the diseases of the body), d. Bhoota Vaidya (Demonology - teachings on the diseases caused by demons), e. Kaumarabhrtya (treatment of the diseases of children), f. Agada Tantra (Toxicology), g. Rasayana (Elixir), h. Vajikarana

IX. Preparation of Dissection:

In Ancient India, during Vedic Period and subsequent to it, using human body for dissection is strongly opposed because it is against the sentiments, beliefs of religious laws that are prevalent in those days. In such circumstances, Sushruta though the Acharya

was circumvented by circumstances of Hindu Religious Laws and Sastras, used to select Cadaver that is not suffered with any chronic disease or poisonous material and had not attained 100 years of age and from which the fecal contents of the intestines have been removed. Such parts removed from the Cadaver are wrapped in Munja (Bush or Grass), Bark, Kusa, Flax etc kept inside a cage and put in a slowly flowing river and allowed to decompose in an unlighted area. After proper decomposition for a period of seven nights the Cadaver is removed from the cage and then dissected slowly by rubbing with the brushes made out of any of Usiri (fragrant roots of plant), Hair, Bamboo or Balavaja (Coarse Grass). After this procedure on the Cadaver Sushruta is able to examine and identify the internal and external parts and their sub divisions were examined with naked eye (Singhal and Guru, 1973). Sushruta in their Sushruta Samhita categorically mentions regarding Surgical procedures, use of specific instruments and type of procedures that are to be conducted. Acharya's Samhita clearly describes, regarding the knowledge of human anatomy by mere inspection of a Cadaver and also through human dissection. He believed that a student/Shishya who is aspiring to be a Surgeon, it is necessary for the student to acquire good knowledge of the structure of the human body and the internal parts thereon.

Manusmriti written by Manu which is an authority on religious, customs and beliefs governing in those days, also emphasized in the book which is popularly known as Hindu Laws of Manu in Ancient India mentions about punitive measures for the crime of adulteration and such other Anti Hindu Law functions have the offender's nose cut. Sushruta developed a procedure for repairing such damaged nose in the Samhita, which is the basic foundation of the present

Cosmetic Surgery and also reconstructive Surgical techniques used presently.

X. The Procedure of Grafting (Skin) Developed by Acharya Sushruta:

The Ancient Indian Physician Acharya Sushruta, who is regarded as the Father of Surgery in his book called Sushruta Samhita, World's earliest works on medicine and surgery, and also who identified 1100 diseases in those days and the use of medicinal plants to cure those diseases and also who authored and practiced number of surgical procedures, has included three types of,

“The Skin grafts and reconstruction of the nose”

Acharya Susrutha in Skin grafting procedure developed,

“the technique of taking out some pieces of skin from one part of the body and transplanting the same in the other part where it is needed.”

Today's Surgeons, who are using the technique of Skin grafting to restore those areas to normalcy that are damaged due to trauma, infection, burns and also any damages during surgical operations. It is so astonishing when we observe the present technique of grafting by the modern healthcare professionals and the principles and the procedures are all can be traced from Acharya Susrutha's book “Sushruta Samhita”.

It is also surprising to note that Acharya Sushruta also developed the system of grafting in those days,

“A surgeon well versed in the knowledge of Surgery should slice off a patch of living flesh from the cheek of a person so as to have on its ends attached to its former seat (Cheek) then the part, where the artificial ear lobe is to be made should be slightly scarified and the living flesh, full of blood and sliced off as previously directed, should

be adhered to it (so as to resemble natural ear lobe in shape) the flap should then be covered with honey and butter and bandaged with cotton and linen and dusted with the powder of baking clay”

This type of procedure to adopt for any surgeon will have a good knowledge of human anatomy especially in the facial region including flow of blood and tissues.

a. Ophthalmology:

Sushruta also gave a thought and spent much time about the eye of a human body (ophthalmology). In those days, Cataracts are very common disease and in that area that made Acharya to adopt a particular procedure developed by himself and also the required instruments for the removal of Cataracts and to get the vision improved for those suffering with Cataracts.

In the Samhita, Acharya describes about human eye and mentions that the human eye included five basic elements, Earth (bhu), Fire/Heat (Agni), Air (Vayu), Fluid (Jala) and void (akasa). While comparing these five elements physically with the eye Acharya wrote in his Samhita,

“Extra Ocular muscles are the solid Earth, Heat/Fire is the blood flowing through the Vessels, Air forms the iris and pupil, the vitreous part is attributed to the fluid element. Finally the lacrimal duct (transmits tears from the surface of the eye to the nasal cavity) are derived from the void.”

Sushruta delineated five anatomical divisions of the eye namely,

“Eye Lid, Eye Lashes, Sclera (white outer layer of eye ball), Choroid (A thin layer of tissue that is part of the middle layer of the wall of the eye, between the sclera (white outer layer of the eye) and the retina (the inner layer of nerve tissue at the back of the eye)) and the Pupil (Raju, 2003)”

Sushruta performed this procedure in an auspicious manner especially during summer (warm season) – the skin is rubbed with a pledget (a small flattened pad of wool

, cotton , etc) saturated with an oily medicine followed by heated bath and the patient is given light refreshment. The room where the procedure was conducted is fumigated with vapours of white mustard, bdellium (aromatic gum resin - Guggilam), Nimba Leaves (Nimba Patra), and the resinous gums of Sala Trees (Guggilam Tree - in order to get rid of the area from insects). In sense of Cannabis is used in addition to wine for sedation. While the patient sits on a stool facing the surgeon, the surgeon conducts the procedure as mentioned by Sushruta. During this procedure all precautions are taken to see that the patient does not sneeze or cough and after the procedure the patient is put under observation and his eyes are inspected for every four days, if there is no improvement the same procedure is repeated (Raju, 2003).

b. Pelvis and Perineum:

In those days of Vedic Period and subsequently and when majority of the people are believers of Hindu Religion Customs and practices, the Sastras, in those days gave emphasis on reproduction and sexual energy. This has been elaborately mentioned by Sushruta in the Samhita by giving more attention to “male urogenital issues” and at the same time addressing the health of a women. In this regard, Acharya Sushruta advocated the use of dilators, irrigating syringes and Catheters. Acharya Sushruta elaborately mentioned the procedure and management of Urethral Stricture via dialation and Urethro Plasty.

XI. The case of niruddha prakasha (stricture of the urethra),

“In the case of Niruddhaprakasha (stricture of the Urethra), a tube open at both ends made of iron, wood or shellac be lubricated with clarified butter and gently introduced into the Urethra. Thicker and thicker tubes should be made to dilate in this manner and emollient food should be given to the

patient. As an alternative, an incision should be made into the lower part of the penis avoiding the sevani (raphe) and it should be treated as an incidental ulcer". (Das, 1983).

XII. Origin of organ transplantation and plastic surgery in ancient India (Vedic Period):

As Amit Abraham mentioned, "After I die If I am buried, I will rot. If I am burnt, I will become ash but if my body is donated, I will give the new life and happiness to many"

In the Present Healthcare Society, many believes that Transplantation of Organs and Tissues represents one of the most unimaginable achievements of Modern Healthcare. However, the statement is not sustainable unless we trace the origin of Organ and Tissue Transplantations that took place as early as in Ancient India especially in Vedic Period.

As we look into the Ancient Indian Religious books on Mythology, we found number of examples that are related to Organ Transplantation; In Indian Mythology, we found stories and figures where human organs are replaced by animal organs and the miracle of Saint Cosmos and Saint Damien from Christian Mythology as described in the lives of the saints needs mention in identifying the similarity of modern transplantation. Organ and Tissue Transplantation in healthcare process literature refers to, "one persons Organ is removed and Transplanted to another person". As we trace out the history of Ancient India, especially during and after Vedic Period, Organ Donation has a significant path in Indian Culture and those following with the Hindu Way of living, and those are guided by the Vedas. The Vedas and Ancient Indian Culture has placed emphasis on the idea of saving others lives i.e. nothing but Organ Donation is the utmost donation in One's Own life. The

concept of Yajna which literally means "sacrifice" or "offering" has been given utmost importance in Vedas in Ancient India. Similarly in the list of "Ten Niyamas or Virtuous Acts" as found in the Indian Scriptures, the third is "Daan" or "Selfless living". According to the Indian Holy Book "Bhagwadgita" through Chapter 2.25 states, "The soul is spoken of as imperceptible, inconceivable and unchangeable. Knowing this you should not grieve for the body".

As we trace out the Ancient Indian History, we noticed "Sage Charaka", who is the physician and "Sage Sushruta" a Surgeon and eminent Scholars in Healthcare have developed the "Organ and Limb Transplantations" in Ancient India; also "Skin Transplantations" are also used to take place in Ancient India especially during "Sushruta and Charaka". It is not uncommon to mention the story of "Lord Ganesha", the son of Lord Shiva and Parvati. When Shiva in anger decapitated the head of his own son and at the request of Maa Parvati, Shiva restored the son by replacing it with "Elephant Head". In a similar story, in Dhaksha Yajna it is mentioned that Lord Shiva when he beheaded Dhaksha, but after everybody requested Lord Shiva restored the beheaded Dhaksha's body and was replaced with "Goat's Head" which was there for the sacrifice in the Yajna. These two stories have no proof but the principle behind is, transplantation which is being used presently.

XIII. Sushrut as neurosurgical Techniques:

Sushruta the highly acclaimed icon of Surgery and Surgical Procedures in Ancient India, who is responsible for development of surgical procedures, techniques and instruments that are unknown in the World of Medicine. A close look at the Sushruta Samhita, the treatise written by Acharya Sushruta reveals his vast knowledge of

physiology, pharmacology, anatomy and also Neurosurgical procedures. Though, Acharya pioneered many surgical procedures including Plastic Surgery, Ophthalmology and Urology, also an innovator in the field of Neuro Surgery.

According to Benerjee et al,

“Sushruta dwells on surgical procedures involving the head and pertaining to the Cranial structures, mainly dealing with warfare injuries, including trephining, excising, probing, puncturing, Suturing and evacuating collected fluids”.

This also clearly shows that, Acharya Sushruta in Ancient India during Vedic Period and subsequently had developed Urosurgical methods and procedures dealing with head trauma and probably evacuation of Intra Cranial Hemorrhages. It is also quite clear that Acharya Sushruta acclimatized himself in understanding the nervous system and their functions and the use and utility of the nervous system in the human body.

Acharya Sushruta elaborated on this subject of Nervous System in human body, “The Ten up-coursing Dhmanis (Nerves) perform such specific functions of the body as sound, touch, taste, sight, smell, inspiration, sighing, yawning, sneezing, laughter, speech, and breathing etc., and tend to maintain the integrity of the body.....the down coursing Dhmanis (Nerves) respectively form the channels for the downward conveyance of Vayu(Flatus, Urine, stool, semen, pate menial fluid etc)”

In addition, Acharya Sushruta also explained,

“Two nerves lower down at the back of ear (vidhura) which if cut produce deafness; a pair of nerves inside the two nostrils which if cut cause anosmia; a pair of nerves below the end of the eyebrow which if cut causes blindness”.

Trephination: Trephination, also known as trepanning, trepanation or burr holing, is one of the oldest surgical procedures known to humanity and refers to a surgical procedure in which a circular piece of bone is drilled and excised, most commonly from the human skull.

It is one of the earliest documented Surgical Procedure in Ancient India by Acharya Sushruta.

Acharya Sushruta pioneered the Surgical Procedure for Head and Spine cases and the management of head injuries using Trephination.

In addition, Acharya Sushruta, developed a technique,

“to achieve hemostasis in highly vascular regions of the body such as the Cranium (skull) described the use of cautery (A procedure that uses heat from an electric current to destroy abnormal tissue, such as a tumor or other lesion.)” before other started using the procedure.

Acharya Sushruta also mentions in his Sushruta Samhita that,

“A fire is better than an Alkali as far as its healing property is concerned... a burning of the skin is accompanied by a peculiar bursting or cracking sound. The skin becomes contracted and emits a fetid (rotten) in case where the flesh is burnt, the effected part assumes a dove colour of blackish brown, marked by pain and little smelling, and the incidental ulcer becomes dry and contracted.....the regions of the eyebrows, forehead and temple bones, should be cauterized in diseases affecting the head as well as in a case of Athimantha (Ophthalmic).

Finally it clearly shows that Acharya Sushruta’s writings on surgical procedures and techniques demonstrate that Acharya’s knowledge of elaborate numerous surgical procedures including Neuro Surgical Treatment. It is work mentioning here the University Grants Commission and the

Central and State Governments and the Indian Medical Associations should sit together and examine this introduction of this Ancient Indian Knowledge on Medicine and Surgery in the present Medical Curriculum.

XIV. Plastic Surgery and Dental Surgery in Ancient India:

A. Plastic surgery:

Sage Sushruta, the eminent Scholar and Surgeon in Ancient India and who is called as father of Plastic Surgery who compiled all his experiences in Surgery in Sushruta Samhita, he mentions in detail about Surgery and this text is considered to be the oldest text in the World on Surgery. From this, it can be noticed that, Sushruta is the father and inventor of Cosmetic Surgery Technique and used to reconstruct the noses and ears which were amputated as punishment in Ancient India for the crimes committed. These techniques and practices continued for many centuries.

As the present Generation think that, Plastic Surgery is an innovation in the modern scientific world especially in the Western countries is not correct. When you read the history of medicine of Ancient India in Vedic Period and subsequently one can notice that,

“The roots of Cosmetic and Reconstructive procedures are more than 2500 years old. It is a misconception that the “Plastic” in Plastic Surgery refers to a artificial material when it actually derives from the greek word, “Plastikos” meaning ‘to mold’ or ‘to give form’”.

It is not surprising to notice that sum of the instruments and tools that were described in Sushruta Samhita are still being developed in the 21st Century.

Acharya Sushruta mentioned that,

“The purpose of Plastic Surgery was not nearly as Aesthetic or Superficial, it was more about improvement of deformed body

parts, most notably Ears, Noses and using Skin from other parts of the Body for the same was a norm back in the day as well”

Acharya Sushrutas treatise called Sushruta Samhita gives,

“the first written record of a forehead flap rhino plastic, a technique still used today, which a full thickness piece of skin from the forehead is used to reconstruct a damaged nose during that period (Ancient Period)”.

These procedures were adopted to those criminals who lost their noses as punishment for their illegal activities.

XII. The other Surgical Procedures (Shalya Chikitsas) developed by Acharya Sushruta:

In addition Acharya Sushruta’s, many surgical procedures of which the important relevant surgical procedures are mentioned below,

Acharya Sushruta in addition to General Surgery in Trauma cases, gave an indepth account of the treatment of “twelve varieties of fractures and six types of dislocations”. This procedures that are invented by Acharya Sushruta is making spellbound, the present Orthopedic Surgeons in the modern healthcare environment.

B. Dental Surgery:

In addition to the Plastic Surgery already described above, Acharya Sushruta also developed Dhanta Chikitsa (Dental Surgery) in their time. Acharya Sushruta made it mandatory for those Shishyas who want to take up their career in healthcare procedures, directing them,

“to study for atleast six years for starting their own procedures. Acharya Sushruta made it mandatory to all those Shishyas (students) who want to prosecute their studies in medicine should take a oath (similar to the registration and oath by the present medical students)”.

XIII. Genetic Engineering:

It is appropriate thing to mention regarding Genetic Engineering that is prevailing in the Ancient India in Vedic period and subsequently, in the words of Prime Minister Sri. Narendra Modi,

“We worship Lord Ganesha. There must have been some Plastic surgeon at that time who got an elephant’s head on the body of a human being and began the practice of plastic surgery”.

Xiv. Shalya Chikitsa (Surgery) in Ancient India – course adopted by Acharya Sushruta:

As we see the present Medical course for an aspirant to be professional in Healthcare, Acharya Sushruta developed this system of course long ago i.e. in Ancient India during his period under the Gurukula Curriculum (Guru Shishya Parampara), Acharya made it compulsory for those aspirants to become a professional Vaidyar

“to study for atleast six years for starting their own procedures. Acharya Sushruta made it mandatory to all those Shishyas (students) who want to prosecute their studies in medicine should take a oath (similar to the registration and oath by the present medical students)”.

In addition Acharya Sushruta, used to direct the students that,

“A student of surgery should learn about the human body and its organs by dissecting a dead body”. (Anatomy)

Acharya Sushruta, used to advise the shishyas,

“Anyone who wishes to acquire a thorough knowledge of anatomy, must prepare a dead body and carefully observe and examine all its parts.”

The method adopted by Acharya Sushruta to prepare the dead body for the purpose of Anatomy was,

“To submerge the body in water and allow it to decompose followed by an examination of the decomposing body at intervals to

study structures, layer by layer, as they got exposed following decomposition”.

The interested point to note is, unlike the present system of dissection was carried out without a knife in Acharya’s days.

XV. Conclusion:

As already mentioned above, in this article an attempt is made, and to identify the traces of healthcare/healthcare professionals and procedures in addition to Yantras of Shalya Chikitsa (Surgical equipment) that were developed and used by the father of the Surgery who also the inventor of the same, Acharya Sushruta is to be remembered forever. This Scholar’s treatise on Shalya Chikitsa (Surgery) in Acharya’s famous book Sushruta Samhita is a testimony of his vision and understanding of the diseases/ailments. When the other part of the World has no queue in making the human parts that have become partially or totally non functional due to one reason or other, when there is no sophistication and equipment as we use in present surgical forms or surgeries, Acharya Sushruta not only developed such sophisticated equipment that can be used both internally and externally to make the partially or totally invalid parts of the human body to bring them to functional, so that such disabled persons can happily live without any assistance from outside. It is not practical to bring out the entire surgical procedures and the equipment used by Acharya Sushruta in Ancient India during Vedic Period and that are in used till latest Surgical Equipment are developed, only a few glimpses of surgical glory of Ancient India was brought into the fore. Every medical student who are presently pursuing their studies in medicine in any form either Allopathy or otherwise should acclimatize themselves with that Ancient Indian Glory. To conclude one could say,

आहारसम्भवं वस्तु रोगश्चाहारसम्भवः।³

न चाहारसमं किञ्चित् भैषज्यमुपलभ्यते।

शक्यतेऽप्यन्नमात्रेण नरः कर्तुं निरामयः॥

भेषजे नोपपन्नोऽपि निराहारो न शक्यते।

भिषग्भिराहारो महाभैषज्यमुच्यते॥⁴

in the words of Sage Charaka and Maharshi Kashyapa.

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XI. Declaration:

The author declares that there is no competing interests nor any gains whatsoever, except to bring out the past glory of the Ancient Indian and Medical System and how they are relevant and appropriate even today for certain ailments/diseases where there is no answer

to cure except containing the diseases and prolonging the life.

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