

ASPECTS OF SANDHANA KARMA AND ITS RELEVANCE IN MODERN SURGERY

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ABSTRACT

Sushruta Samhita is an ancient tradition of Surgery in India. *Acharya Sushruta* was the first and famous surgeon of ancient science. *Acharya Sushruta* has given detailed description of an exhaustive range of surgical methods. He has described plastic surgery like **Karna-Sandhan** (Auroplasty), **Nasa-Sandhana** (Rhinoplasty), **Oshtha-Sandhana** (Lipoplasty). In old days the royal punishment was to cut nose, ear lobes etc. The Indian surgeons correcting such deformities by shifting the skin flap to reform the nose, ear etc. They have plenty of opportunity to do so and made Indian surgery unique. In modern surgical field **Plastic Surgery** is one of the important super specialty branch involving **restoration, reconstruction, or alteration** of the human body which is mainly divided into two categories i.e. **Reconstructive** and **Cosmetic** surgery. Modern literature of plastic surgery also

gives credit to *Sushruta*. From basic principles of plastic surgery to some complicated surgeries like Rhinoplasty, surgeries of cleft lip etc practiced today have direct origin from *Sushruta Samhita*. The present article is an attempt to highlighting some basic principles and procedures of plastic surgery in **Ayurveda** and **Modern sciences**.

KEYWORDS: Plastic surgery, *Ayurvedic* concept of plastic surgery, Rhinoplasty in *Ayurveda*, Auroplasty in *Ayurveda*.

INTRODUCTION

Plastic surgery is a medical speciality which deals with reconstruction or alteration of the human body it includes reconstructive and cosmetic surgery^[1] The term plastic derived

from a Greek work **Plastikos** which means to mould or to shape^[2] Reconstructive plastic surgery is performed to correct functional impairments caused by burns, traumatic injuries (such as fractures), congenital anomalies (such as cleft lip or cleft palate), developmental abnormalities, and cancer or tumors. The oldest reference of plastic surgery was found in Ancient Egyptian medical text.^[3] The reference of reconstructive surgery in India was traced in 6th century B.C. where *Sushruta* has described reconstruction of the nose by using the flap of forehead and to Al- Zahrawi the 10th century Islamic surgical scholar^[4] some of examples like Bispala, wife of king Khela, lost her leg in war. *Ashwinikumaras* transplant her leg by an iron leg. These are some examples which explain extent of knowledge of plastic surgery from very long period. In ancient era, advances in plastic surgery took place as a consequences of wars and the battle wounds sustained by warriors. *Sushruta* being **Shalya Pradhan** has described various reconstructive methods or different types of defects like removal of cyst and swellings, removal of disfiguring of fatty depositions, release of the skin for covering small defects, and the use of rotated pedicle flaps for covering partial or complete loss of skin or tissue from an area. *Sushruta* has mentioned plastic surgery in the view of **Sandhana Karma** like *Nasa-Sandhana*, *Karna-Sandhana*, *Oshta- Sandhana*.

Modern techniques of plastic surgery were developed with sir **Harold Gillie's** (father of modern plastic surgery)^[5], tubed pedicle flap for facial reconstruction along with epithelial outlay technique, intranasal skin graft, replantation, cosmetic surgery, sex reassignment. The first microvascular surgery in humans were performed by **Dr. Antia**. The first textbook to include comprehensive account of plastic and reconstructive surgical operations was written by a French surgeon **Alfred Velpeau** in 1839.

General principles of plastic surgery includes

- Plan of procedure pre-operatively.
- Pre-operative patient position.
- Use of anesthesia.
- Skin incision and excision.
- Role of debridement and irrigation.
- Role of suturing techniques.
- Management of wound.

Plan of procedure pre-operatively; Prior to an operation the time which a surgeon devotes to a careful pre-operative plan is of critical importance and often determines the success or failure of the procedure. Effective planning should ensure that the surgeon does not embark on a surgical procedure unless the required equipments are available.

Pre-operative patient position; The goal of positioning the surgical patient are ensuring patient comfort and dignity, maintaining hemostasis, protecting anatomical structures and avoiding complications and injuries along with promoting access to the surgical site administration of I.V. fluids and anesthetic agents.^[6]

Use of anesthesia; the procedures involved in plastic surgery are very extensive, and anesthesia plays a vital role; from local techniques to neuroaxial anesthesia and general inhaled or intravenous anesthesia procedures.

Skin incision and excision; Incision should be placed along or parallel to the skin tension lines whenever possible, because in terms of ideal wound healing this leads frequently to physiological scar formation with a good aesthetic and functional result without the risk of wound dehiscence or scarred contracture. In case of incisions in exposed regions like the face or the female breast it is recommended to conceal the scar in pre-existing wrinkles or behind the hairline^[7] Every surgical incision must be performed considering the therapeutic aims, practicability and the functional and aesthetic result of scar formation, many surgeons preferred **Langer's lines**, these lines were developed by **Karl Langer** from corpses in rigor mortis. Later **Barges** described **relaxed skin tension lines**, which follow furrows formed when the skin is relaxed and produced by pinching the skin, an example of this principle is the transverse wrinkling of forehead, which is perpendicular to underlying vertically oriented frontalis muscle.^[8]

Ancient aspect; *Acharya Sushruta* has mentioned *Ashtavida shastrakarma*, among these he has clearly mentioned about the *Chedana Karma* (incision). *Sushruta* has mentioned three types of *Chedana* according to the different sites of body a) *Tiryak Chedana* means oblique incision (on head, eyelids, cheeks, lips, gums, axilla, hip joint) b) *Chandramandala Chedana* means circular incision (over extrimities) c) *Ardhachandraakrati Chedana* means semicircular incision (penis and anal region)^[9] *Sushruta* has clearly mentioned that if the rules of incision are not followed there are chances of *Chiradvranasanroho* (delayed wound healing), *Mamsakandi* (keloid formation)^[10]

Role of debridement and irrigation; Debridement is the removal of foreign material and devitalized or contaminated from or adjacent to a traumatized or infected lesion, until surrounding healthy tissue is exposed. Debridement is recognized as a major component of wound management to prepare the wound bed for re-epithelialization. After debridement wound should be kept moist by normal saline or sterile water.^[11] The condition in which granulation tissues has been allowed to persist for long time are difficult to treat. Debridement occurs naturally on its own by the body's ability to shed off dead tissues. However, moreoften it requires a medical procedure. **Ancient aspect;** for *Vranachikitsa Acharya Sushruta* has described *Shasthiupkarmas* in *chikitsa sthana*, among these *shashthiupkarma* he has described *Lekhana* as 16th upkarma. *Lekhana karma* should be done over the hard, larged, round margin wound and wound with hard fatty mass. *Vartmanamtupramanenasamam*^[12] means that *lekhana* should be done such as the edges of wound should be at equal level.

Role of suturing techniques; In surgery the act of sewing or bringing tissue together and holding them in apposition until healing is an art. Suture material is an artificial fiber used to keep wound together until they hold sufficiently well by themselves by natural fiber (collagen) which is synthesized and woven into a stronger scar. Sutures are placed through epidermis into the deep dermis approx. 2mm from wound margin of the flap because after wound closure the edges of the wound softens due to **Collagenolysis** and the holding power is impaired. The choice of suture is depend on the location of lesion, thickness of skin in that location, and the amount of tension exerted on the wound. **Continuous suture;** are also known as running stitches, continuous suture are a series of stitches taken with one strand of material. The strand may be tied to itself at each end, or looped, with both ends of the strand tied together. Continuous suturing leaves less foreign body mass in the wound. **Interrupted sutures;** they uses a number of strands to close the wound. Each strand is tied and cut after insertion. This provides a more secure closure. **Subcuticular sutures;** are placed in the dermis, beneath the epithelial layer this technique involves taking short, lateral stitches the full length of the wound. **Ancient aspect;** In *Sushruta Samhita* detailed description of suturing has mentioned. According to different parts of the body four types of suturing has been described by *Sushruta* i.e *Vellitaka, Gofanika, Tunnasevani, Rujugranthi*^[13] while suturing precautions to be taken has also mentioned, as sutures should not be placed too close or too far from each other.^[14] *Sushruta* has explained about the different types of needles according to

different areas of the body, *Vrutanguladwgyam* (for closing of wound over the less fatty area and joints), *Ayatatryangulatrystra* (for closing of wound over fatty area), *Dhanurvakra* (for closing of wound nearby the vital organs)^[15]

Management of large wounds; Wounds can be conceptualized as disruption of normal structure and function of tissues. They can be caused by trauma that originate inside or outside the affected tissue and vary from an acute and controlled injury to a generalized treatment.^[16] In such type of cases where skin graft will not suffice then the use of flap is most appropriate option. Some of difficult wounds, like wound with exposed bone devoid of periosteum; for the management of these type of wounds free flap reconstruction is a well established technique but in some conditions like extensive burns or crush injuries in which the condition of recipient's vessels eliminates free tissue transfer, the other options are pedicled flaps and negative pressure dressing. Another example is post radiation wound; for these type of wound best option is resection of wound and surrounding fibrosis with possible skin grafting.^[17]

Ancient aspect; *Acharya Sushruta* has described about the *Shashtiupkarmas* for the treatment of wound, there he described *Nirvapana*, *Utsadana*, *Avasdana*, *Utkarika* For the treatment of large wound.^[18]

Some specific defects

Defect of nose; Ancient aspect, *Acharya Sushruta* has described detail description of *Sandhana Karma* in *Sutrasthana* 16th chapter. For the defect of nose he said that a leaf of exact defect size should be taken and then same size piece of skin from forehead should be sutured over the defect properly then it should be properly bandaged then inserted two small pieces of *Erandmoola* into the nostrils to facilitate respiration.^[19]

Modern aspect

The goal of nasal reconstruction is the restoration or refinement of nasal form and function. Nasal reconstruction occupies a special position in facial plastic surgery because of complex three dimensional surface of the nose, the varying thickness of skin covering it, its varying type of scaffolding ranging from rigid bone to flexible cartilage, and its inner epithelial line. Ideally skin flaps are used between the subunit of the nose- the dorsum, sidewall, tip of the nose, the soft triangle, the nostrils, and the columella. Rotation flaps, transposition flaps, V-Y plasties, subcutaneously pedicled sliding

flaps^[20], and biloped flaps are the known standard techniques. Median defects involving the tip and distal dorsum of the nose can be repaired with an extension flap from the cranial part of the dorsum^[21] Very small defects at the tip of the nose can be covered with full thickness skin grafts from the forehead beneath the hairline.

Defect of ear; Ancient aspect, In *Sutrasthana Acharya Sushruta* has described piercing and bandaging of ear lobule and defects of ear. To avoid complications during piercing he has advice to take care of three important vessels (*Kalika, Marmika, Lohitika*). *Sushruta* has also mentioned 15 types of ear defects with their management. In case of absence of ear lobe one should have to slice off a patch of living flesh from the cheek (*Sanubandhenajivitam*)^[22] of a person devoid of ear lobes. Then the part, where the artificial ear lobe is to be made, should be slightly sacrificed with a knife, and the living flesh, full of blood, should be adhesioned to it so as to resemble a natural ear lobe in shape.

Modern aspect; Ear reconstruction is a form of surgery that can rebuild an ear by trauma or cancer surgery, or missing due to a congenital disorder. Along with surgery to rebuild or repair the ear. Auricular reconstruction is a great challenge in facial plastic surgery. Different options are available like stick on ear prosthesis, use of synthetic auricular frame, Microtia repair etc. A local technique which was described by **Antia** is ideal for small to medium sized helical defect. In this technique the flap is designed by making an incision along the helical sulcus extending through the anterior skin and cartilage, dissecting the helix and scalp free from one another. The posterior auricular skin is elevated superficial to the perichondrium. The resulting flap is then advanced into the defect.^[23]

CONCLUSION

In the field of surgery plastic surgery is one of the important branch. It is considered to be super speciality branch in surgery now-a-days. *Acharya Sushruta* has very well explained about the plastic surgery, his contribution in the field of surgery cannot be over estimated. Modern sciences also gives credit to *Sushruta*. If we observe carefully, then it is found that all the basic principles of plastic surgery has its roots in *Sushruta Samhita*. He has described various methods like release of the skin for covering small defects, for partial loss rotation of flap was described and for complete losses pedicle flaps from an area. These are clear proofs of the expertise ability of *Sushruta* in the field of surgery.

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