



Review Article

www.ijrap.net



ANCIENT CONSIDERATIONS ON RECONSTRUCTIVE SURGERY: A REVIEW

Anuja Nair NJ¹, Rabinarayan Tripathy^{2*}, Neelima Sherly John¹, Sreedevi V¹, Suresh P¹

¹Final year PG scholar Department of Shalya Tantra, Amrita School of Ayurveda, Clappana P.O, Kollam, Kerala, India

²Professor, Department of Shalya Tantra, Amrita School of Ayurveda, Clappana P.O, Kollam, Kerala, India

Received on: 15/03/16 Revised on: 11/04/16 Accepted on: 22/04/16

*Corresponding author

E-mail: drrabi73@gmail.com

DOI: 10.7897/2277-4343.073106

ABSTRACT

Being beautiful is an inner instinct of mankind. To achieve this many measures are adopted ranging from simpler ones to sophisticated techniques. That made Reconstructive surgery at its peak acceptance and popularity. Historical evidences suggest that reconstructive surgery was first originated in India and Maharsi Susruta is believed to be the first authority to perform Reconstructive surgery. The detailed description of the technique is available in Susruta samhita (Susruta's compendium). This is a bird's eye view on the ancient concepts of reconstructive surgery and it aims at discussing the diverse techniques highlighted in Susruta samhita and to reveal the significance and rationality behind them.

Keywords: Reconstructive surgery, karnasandhana, nasasandhana, oshtasandhana.

INTRODUCTION

Reconstructive surgery is the combination of various surgical skills that aims at restoration of functional and anatomical normalcy of the damage caused due to congenital, traumatic or pathological processes. In reconstructive surgery, grafting is a very common procedure that is the transfer of tissue from one area to other without its blood supply or nerve supply. 'Flap' is another technique which is the transfer of donor tissue with its blood supply to the recipient area.¹ Sandhana karma (approximation of wound edges together) explained by Susruta is popularly accepted as reconstructive surgery by modern surgical experts and is one of the extravagant contributions by Susruta. A retrospective historical analysis tells that even from the ancient times, mutilation of the ears and nose was very common either by injury in wars or as a part of punishment for unlawful activities². So, it was a challenge to the surgeon to repair the damaged part by joining the sheared part or by live tissue from nearby area. It is thus pertinent to overview the concept of Sandhana karma mentioned in Susruta samhita in the context of reconstructive surgery.

Concept of Sandhana Karma

Sandhana karma enumerated at twenty second place of sashti upakrama (sixty modalities for wound management) is not simply refers to seevana karma (suturing) but one of the method to attain sandhana.³ Again Karna-nasa-oshta sandana (Otoplasty-Rhinoplasty-Oroplasty) explained in "karnavyadhabandhavidhi" chapter in sutra sthana where due importance is given to the basic principles of reconstructive surgery like planning, haemostasis and perfection of approximation^{4, 6}. Moreover, analysis of the contra-indications, do's and don'ts, post-operative management are explained by Susruta to emphasize the depth of knowledge on the subject.

Susruta's Concept of Otoplasty

Otoplasty is a surgical procedures for reconstructing a defective, deformed, or absent external ear, consequent to trauma or congenital anomalies e.g. microtia, anotia etc. The otoplastic surgeons manage the deformity in proportions, contour, and appearance, by reshaping, mobilizing, and augmenting of the cartilaginous support framework of the pinna⁷. The methods of Karnabandha explained in Susruta samhita are based on the shape and of fifteen types. From the description given in samhita and commentaries, the exact nature and method of surgical operations is obscure. The methods of karnabandha are innumerable and should be learnt from experts, that which is appropriate at the moment should be decided and undertaken. Dalhana in his commentary states that exact nature of these patterns can be understood by proper observations and regular practice. With reference to Susruta Samhita amongst the fifteen types ten are successful and other five are unsuccessful in practice. According to the textual description the fifteen types are explained in Table 1 & 2.³

While analyzing the unsuccessful methods, the failure of the graft may be due to improper blood supply to the part. Susruta's technique of Gandakarna i.e. cutting a piece of vascular flap of cheek, maintaining its attachment and turning it over on the damaged pinna is a method of choice in modern otoplasty. The surgical procedures for congenital anomalies like anotia, macrotia etc are also elucidated as to cut out a flap of living muscles from the cheek maintaining its vascularity intact, turning it over to the site of ear lobe after scrapping the area. This can be considered as management of anotia (absence of earlobe). If outer flap is elongated repair should be done internally and vice versa. This is the surgical procedure for macrotia. From above descriptions it can be concluded that all techniques described are targeting to correct the defect or deformity by creating an external ear of natural proportions, contour, and appearance⁷.

Table 1: Successful methods

Type	Meaning	Indication
Nemi-sandanaka	Circumference of a wheel (round/circular sewing)	Flaps are equal -Wide ,Thick
Utpala-bhedyaka	Like lotus bud ⁸	Flaps are equal -Wide ,Round
Valluraka	Like dried meat	Flaps are equal-Short,Round
Asangima	sewing a big available portion only in the non- availability of small portion at the same place	One flap only –Inner flap long
Gandakarna	front portion of long outer flap is unified with taking out the cheek muscle	One flap only –Outer flap long
Aharya	Both sides cheek muscle with attachment is taken out and shaping it like pinna.	Little flap on either side
Nirvedhima	Unified by piercing	Flaps flat like a wooden seat attached to tragus
Vyayojima	fabricating the pinna by different kinds of cuttings	One flap is even(thin/thick) other uneven
Kapata-sandhika	Externally unified like panels of a door	long Inner flap, short outer flap
Ardha-kapata-sandhika	Internally unified like half- panel	long outer flap, short inner flap

Table 2: Unsuccessful methods

Type	Meaning	Indication
Sankshipta	Small Remnant ⁸	Dried up pinna, one flap raised other one short
Hinakarna	Insufficient ⁸	Flaps without base, atrophy of muscles
Vallikarna	Creeping or winding ⁸	Flaps thin, uneven ,short
Yashtikarna	Resembles like a Stick ⁸	Flaps small, full of knotty muscles and stiffened vessels.
Kakausthaka	Shaped like the beak of a crow ⁸	Flaps are emaciated with shortened tip and less vascular

Susruta's concept of Rhinoplasty

Rhinoplasty refers to correcting the form, restoring the function, and aesthetically enhancing the nose by resolving nasal trauma, congenital defect and respiratory impediment.⁹ Rhinoplasty operation in the Susruta Samhita is amazingly precise and comprehensive. A leaf of a tree should be taken, cut to the shape and size of the nose, placed on cheek, and then the cheek muscle is raised like a flap of same size maintaining the blood supply, is placed quickly on the mutilated nose after scraping it, then suitable bandage is tied, inserting two tubes into the nose⁴. Susruta's method of rhinoplasty was adopted by surgeons of European countries in the early part of the 16th century A.D by the name "Indian method" and is popular even now². Susruta described various reconstructive methods like release of the skin for covering small defects, rotation of the flaps to make up for the partial loss and pedicle flaps for covering complete loss of skin from an area⁶. While describing nasasandana, the maintenance of the vascularity with cheek muscle is explained, as in modern 'flap' technique. Though today the technique has received many modifications but the basic principles are adopted from Susruta's technique. Surgeons create a functional, aesthetic, and facially proportionate nose by separating the nasal skin and the soft tissues from the osseo-cartilaginous nasal framework, correcting them as required for form and function, suturing the incisions, and applying either a package or a stent, or both, to immobilize the corrected nose to ensure the proper healing of the surgical incision⁹.

Susruta's concept of Oroplasty

The method described by Susruta for correcting the defected lips is joining of the mutilated lips should be done in the same way as joining of the mutilated nose but without insertion of tubes⁴. In the present practice cleft lip is repaired by "Millard cleft lip repair" by rotating the local naso-labial flaps¹⁰. Due importance must be given to post-operative bandaging, methods to promote further growth and healing of the tissue after grafting^{4,5}.

Excess movement of the ear (vighatanam), too much talking (vak-srama), exercise (vyayama), sexual indulgence (vyavaya) and exposure to sun, fire etc (agni santapa), will lead to failure of grafting⁴. Contemporary science gives the explanation of role of shearing stress in the wounded part as a factor that delays healing¹¹.

Sandanakarma is contra-indicated when the area is contaminated by vitiated blood, having less blood supply or excessive bleeding (Asudharaktha, Atipravrttharaktha, Ksheenaraktha)⁴. It is amazing to find that Susruta advocated the principles like asudharaktha as contaminated blood which may lead to infection, atipravrttharaktha as excessive blood flow to the part, may lead to haematoma formation following suturing and will become a potential source of infection. Ksheena raktha can be considered in two senses i. e. decreased total blood volume of the patient and decreased blood flow to the grafting site. In both cases the procedure will not be successful. Due to decreased blood flow there will be chance of ischemia and thereby failure of graft can happen. If the blood is vitiated with vata dosha there will be crack even after healing, in case of pitta burning sensation and itching in case of kapha. If there is excessive flow there will be swelling and discoloration. If there is no sufficient blood supply to the part the part does not grow. While looking into technique of reconstructive surgery, factors responsible for successful grafting are – avascular recipient area, free from infection, absence of excess blood, serum or exudates¹². After skin grafting the part should be immobilized and nutritional status of the patient should be satisfactory.

CONCLUSION

Karna-nasa-oshta sandhana karma is a testimony to the ingenuity and high standard of surgical skills of the ancient Indian Surgeons. The detailed description of Sandhanakarma by Sushruta is amazingly meticulous, comprehensive and relevant today. More appreciable results may be expected by adopting the concepts of do's and don'ts, indications and contraindications mentioned by Susruta while conducting reconstructive surgeries. Susruta emphasized all the basic

principles of reconstructive surgery and his important contributions like the technique of pedicle flap, repair of ear lobe defect, repair of traumatic and congenital defect of the lip etc still remains as the sovereignty in the field of Reconstructive Surgery.

REFERENCES

1. Courtney M.Townsend ,Sabiston Text Book of Surgery, Published by Elsevier, 18th Edition 2010, vol 2, section 13, chapter 73, Plastic Surgery.
2. Acharya Susrutha, Susrutha samhita with English Translation of text & edited by Srikantha Murthy KR, Chaukamba Visvabharati Orientalia Publications, Reprint Edition 2010, Volume 1, Chptr.No 16.
3. Acharya Susrutha, Susrutha samhita with English Translation of text & Dalhana's commentary edited by Sharma PV, Chaukamba Visvabharati Orientalia Publications, Reprint Edition 2010, Volume 2, Chptr.No 1.
4. Acharya Susrutha, Susrutha samhita with English Translation of text & Dalhana's commentary edited by P.V Sharma, Chaukamba Visvabharati Orientalia Publications, Reprint Edition 2010, Volume 1, Chptr.No 16
5. Panigrahi, Hemanthkumar, Origin of surgery: A history of exploration of Plastic & Reconstructive surgery. Int. J. Res. Ayurveda Pharm 2013;4(5):634-637 <http://dx.doi.org/10.7897/2277-4343.04301>
6. Saraf S, Parihar R, Sushruta: The first Reconstructive Surgeon in 600 B.C, The Internet Journal of Reconstructive Surgery 2006 Volume 4 Number 2.
7. <https://en.m.wikipedia.org/wiki/otoplasty>
8. SpokenSanskrit.de/Sanskrit dictionary for spoken Sanskrit.
9. <https://en.m.wikipedia.org/wiki/rhinoplasty>
10. Sriram Bhat M, SRB's Manual of Surgery, Jaypee Brothers Medical Publishers, 3rd Edition 2009, Chapter -2, Pg.No.303
11. Charles Brunicaudi, F. Shwartz's Principles Of Surgery, Mc Graw Hill Medical Publishing Division, 8th Edition, Chapter 8- Wound Healing.
12. Das s ,A concise Text Book of Surgery, Published by Dr.S.das, 8th Edition 2014, Chapter-14, Pg.No.178

Cite this article as:

Anuja Nair NJ, Rabinarayan Tripathy, Neelima Sherly John, Sreedevi V, Suresh P. Ancient considerations on reconstructive surgery: A review. Int. J. Res. Ayurveda Pharm. May - Jun 2016;7(3):29-31 <http://dx.doi.org/10.7897/2277-4343.073106>

Source of support: Nil, Conflict of interest: None Declared

Disclaimer: IJRAP is solely owned by Moksha Publishing House - A non-profit publishing house, dedicated to publish quality research, while every effort has been taken to verify the accuracy of the content published in our Journal. IJRAP cannot accept any responsibility or liability for the site content and articles published. The views expressed in articles by our contributing authors are not necessarily those of IJRAP editor or editorial board members.