

# Principle of Reconstructive and Plastic Surgery in Ayurveda

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## ABSTRACT

Plastic Surgery and reconstructive surgery is the great contribution of ancient Hindu civilization to modern era of western medicine with due recognition. Western society considers Maharshi Sushruta as the father of plastic surgery as well as father of Indian Surgery. The basic concept of reconstructive surgery described in terms of different types of Sandhan Karma. The principles for conversion of infected wound to clean wound as well as debridement of traumatic wound, followed by suturing and different types of pedicle rotation are very much relevant in modern era of surgical practice. The relevancy of utility of fundamental principles of plastic surgery to be revalidated and reestablished with scientific tools.

**Key Words** *Sandhan Karma, Reconstructive Surgery, Plastic surgery, Wound*

Received 05<sup>th</sup> January 2026 Accepted 24<sup>th</sup> February 2026 Published 10<sup>th</sup> March 2026

## INTRODUCTION

Time period of Sushruta Samhita is around 6 century BCE and contributed to basic surgical principle, Instruments and Equipment for operation theatre, Eight principles of surgery (Ashtavidha Shastra karma), Para surgical procedure, Experimental surgery, Comprehensive wound management, Fracture and Trauma, Abdominal emergency, Urogenital emergency, Obstetrics emergency, Ophthalmic, ENT and Dentistry, Faciomaxillary surgery, Plastic and reconstructive surgery, Minimal invasive Surgery, Dead body dissection, Anesthesia by Sushruta Samhita. The British doctors learned the basic concept of plastic surgery from India during the

late 18<sup>th</sup> century. They working in India and observed that Indian surgeons performing nasal reconstruction. In 1794, a rhinoplasty performed by an Indian surgeon on Cowasjee, a Maratha soldier whose nose was cut off by Tipu Sultan's forces, was documented. This procedure was published in The Gentleman's Magazine (1794, London) with illustrations. British surgeons were astonished by the success of the operation and began studying the technique. Along with British this technique is also spread to the entire Europe, the Indian rhinoplasty method inspired Joseph Constantine Carpue (England) to perform the first modern rhinoplasty in Europe in 1814. Carpue acknowledged that the technique was derived from Indian surgical knowledge.

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The Indian forehead flap is still used today, known as the median forehead flap . Indian methods laid the foundation of modern plastic surgery. This exchange represents one of the earliest examples of knowledge transfer from India to the West. There are 15 types of Sandhana karma in Sushruta Samhita along with sadhya-asadhyata.

### MATERIALS AND METHODS

#### Varna Sandhana (Approximation of wound edges)-

अपाकोपद्रुता ये च मांसस्था विवृताश्च ये। यथोक्तं सीवनं तेषु कार्यं सन्धानमेव च ॥(Su.chi.-1/45)

The wounds which are uncomplicated by infection , involve the muscles and widely gaping are indicated for suturing and vrana sandhana.

#### Nasa Sandhana (Rhinoplasty)-

The Pedicle Flap from the Cheek

नासाप्रमाणं पृथिवीरुहाणां पत्रं गृहीत्वा त्ववलम्बि तस्या

तेन प्रमाणेन हि गण्डपार्श्वदुत्कृत्य बद्धं त्वथ नासिकाग्रम् । विलिख्य चाशु प्रतिसन्दधीत तत् साधुबन्धैर्भिषगप्रमत्तः ॥(Su.su.-16/49-50)

Taking a tree leaf of the size of the nose and placing it (on the cheek), a flap should be raised of the same size from the side of the cheek maintaining its continuity to cheek ,then it should be approximated to the front part of the nose after making the nose raw and quickly suture the flap carefully by the correct technique.

#### Post-operative Care:

सुसंहितं सम्यगतो यथावन्नाडीद्वयेनाभिसमीक्ष्य बद्ध्वा । प्रोत्रम्य चैनामवचूर्णयेत्तु पतङ्गयष्टीमधुकाञ्जनैश्च ॥

सञ्छाद्य सम्यक् पिचुना सितेन तैलेन सिञ्चेदसकृत्तिलानाम् ।

घृतं च पाय्यः स नरः सुजीर्णे स्निग्धो विरेच्यः स यथोपदेशम् ॥(Su.su.16/51-52)

Having examined the nose which has been properly sutured and correctly shaped, the same should be fixed by two tubes and elevated. Then the powder of red sandal wood, madhuka and rasanjana should be sprinkled on the nose after elevating it . It should be bandaging properly with white cotton and should be soaked repeatedly with sesamum oil. Ghrita should be administered to the patient after the previous meal has been properly digested and a purgative should be prescribed as instructed.

#### Final Appearance:

रूढं च सन्धानमुपागतं स्यात्तदर्धशेषं तु पुनर्निकृन्तेत् । हीनां पुनर्वर्धयितुं यतेत समां च कुर्यादतिवृद्धमांसाम् ॥(Su.su.-16/53)

When the graft has properly taken up, base of the same should be cut . The short graft should be elongated and the long graft should be made uniform.

#### Ostha Sandhana (Cheiloplasty ):

नाडीयोगं विनोष्ठस्य नासासन्धानवद्विधम् । (Su.su.-16/54)

Plastic surgery of the cleftlip should be done similar to that of rhinoplasty but without the use of two tubes.

#### Karna Sandhana (Auroplasty)

तत्र समासेन पञ्चदशकर्णबन्धाकृतयः । तद्यथा-नेमिसन्धानक उत्पलभेडाको बल्लूरक आसङ्गिमो गण्डकर्ण आहार्यो निर्वेधिमो व्यायोजिमः कपाटसन्धिकोऽर्धकपाटसन्धिकः संक्षिप्तो हीनकर्णो वल्लीकर्णो यष्टिकर्णः काकौष्ठक इति ॥(Su.su.16/10)

There are 15 different types of Sandhana karma for repair of the ear are described which are as follows:-

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<b>Shadhya</b>				
Type	Meaning	Explanation	Indication	
1	Nemi-sandanaka	पृथुलायतसमोभयपालि	Circumference of a wheel (round/circular sewing)	Flaps are equal-Wide, Thick
2	Utpalabhedak	वृत्तायतसमोभयपालि	bhedyaka Like lotus bud	Flaps are equal-Wide, Round
3	Valluraka	ह्रस्ववृत्तसमोभयपालि	Like dried meat	Flaps are equal-Short, Round
4	Asangima	अभ्यन्तरदीर्घेकपालि	sewing a big available portion only in the non-availability of small portion at the same place	One flap only -Inner flap long
5	Gandakarna	बाह्यदीर्घेकपालि	front portion of long outer flap is unified with taking out the cheek muscle	One flap only -Outer/distal flap long
6	Aharya	अपालिरुभयतो	Both sides cheek muscle with attachment is taken out and shaping it like pinna.	Both the fragment of cut ear lobules are absent
7	Nirvedhima	पीठोपमपालिरुभयतः क्षीणपु त्रिकाश्रितो	Unified by piercing	when both the flaps of cut ear lobules are absent from the root. In this type remaining part of Putrika (Tragus) is making base for surgery.
8	Vyayojima	स्थूलाणुसमविषमपालि	fabricating the pinna by different kinds of cuttings	One flap is even(thin/thick) other uneven
9	Kapata-sandhika	अभ्यन्तरदीर्घेकपालिरितरा ल्यपालिः	Externally unified like panels of a door	long Inner flap, short outer flap
10	Ardha-kapata-sandhika	बाह्यदीर्घेकपालिरितराल्यपालि	Internally unified like half-panel	long outer flap, short inner flap
<b>Ashadhya</b>				
1	Sankshipta	तत्रशुष्कशष्कुलिरुत्सन्नपालिरितराल्यपालिः	Small Remnant	Dried up pinna, one flap raised other one short Degenerative condition of pinna
2	Hinakarna	अनधिष्ठानपालिः पर्यन्तयोः क्षीणमासो	Insufficient	Flaps without base, atrophy of muscles
3	Vallikarna	तनुविषमाल्यपालि	Creeping or winding	Flaps thin, uneven, short Microtia with preauricular appendages and skin tag
4	Yashtikarna	प्रथितमांसस्तब्धसिराततसूक्ष्म पालि	Resembles like a stick	Flaps small, full of knotty muscles and stiffened vessels. Pinna and lobule have keloids and atrophied
5	Kakostha	निर्मांससङ्क्षिप्ताग्राल्यशोणितपालिः	Shaped like the beak of a Crow	Flaps are emaciated with shortened tip and less vascular Microtia

**Basic principles of Sandhana**

a) Direction of Incision

अनुलोमं शस्त्रं..... ।(Su.su.5/7)

Incision should be made in the direction of hair line.

b) Achieving Haemostasis

पुनरवल्लिख्याननुन्नतमहीनमविषमं च कर्णसन्धि सन्निवेश्य, स्थितरक्त सन्दध्यात्। (Su.su.16/17)

The area should be made raw and the ear is neither elevated nor devoid of a portion or

irregular. After adequate haemostasis, approximation by suturing should be done.

c) Bandhan

शिथिलं च बद्ध्या।( Su.su.-16/17)

Bandaging should be loose (neither too tight or too loose).

d) Post operative precautions

विघट्टनं दिवास्वप्नं व्यायाममतिभोजनम् । व्यवायमग्निसंतापं वाक्श्रमं च विवर्जयेत्॥(Su.su.16/18)

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Post-operatively patient should avoid rubbing (the ears), day sleep, physical exertion, heavy meals, sexual indulgence, exposure to dry heat or fire and the strain of talking.

e) Different types of medicine

अथ क्षौमपिचुच्छन्नं सुस्यूतं प्रतिसारयेत् । प्रियङ्गुवञ्जनयष्ट्याह्वरोधचूर्णः समन्ततः ॥ शल्लकीफलचूर्णैर्वा क्षौमध्यामेन वा पुनः। ततो व्रणं यथायोगं बद्ध्वाऽऽचारिकमादिशेत् ॥(Su.su.-25/27-28)

After proper suturing it should be well covered by sliken gauze and cotton. The powder of priyangu, anjana, madhuka or lodhra should be sprinkled around; or else powder of shallaki fruit or ash of silk may be sprinkled. Then the bandage should be applied as indicated and necessary post-operative instructions given.

f) Suture material and different suturing technique

सीव्येत् सूक्ष्मेण सूत्रेण वल्केनाश्मन्तकस्य वा । शणजक्षौमसूत्राभ्यां स्नाय्वा बालेन वा पुनः । मूर्वागुडूचीतानैर्वा सीव्येद्वेल्लितकं शनैः ॥

सीव्येद्गोफणिकां वाऽपि सीव्येद्वा तुन्नसेवनीम् । ऋजुग्रन्थिमथो वाऽपि यथायोगमथापि वा ॥(Su. Su. 25/20-22)

Suture material

Suturing should be meticulously done by a continuous suture with fine thread, bark of Ashmantaka, thread of Sana, Silk thread, Tendon, Hair or with fibres of Murva or Guduchi.

Wound should be sutured by 4 main technique as follows :-

- 1) Gophanika suture (Mattress suture)
- 2) Tunnasevani suture (Subcuticular suture)
- 3) Rijugranthi suture (Interrupted suture)
- 4) Vaelitaka suture (Continuous suture)

5) By other techniques of suturing as and where applicable.

## OBSERVATION

The different principles of pedicle rotation are in accordance with nature and types of injury. Survival of the different flap depends upon preoperative, intraoperative and postoperative care including diet and regimen. Different types of local wound care product described in Sushruta Samhita for primary repairing of traumatic wound are very much useful.

## RESULT

The general principles of reconstructive surgery described in Sushruta Samhita are identical with the principles of Western medicine considering the age of civilization to modern medicine .

## CONCLUSION

Plastic and reconstructive surgery is a most demanding surgical branch in modern era of surgical practice with a great legacy from Sushruta Samhita.

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