PLASTIC AND RECONSTRUCTIVE SURGERY IN AYURVED

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ABSTRACT
Sandhan karma as described by Acharya Sushruta is a very old science which can be compared with the plastic surgery or reconstructive surgery in recent times. It is however very difficult to say when the first reconstructive operation on mankind was performed. Sushruta Samhita, which describes the ancient tradition of surgery in India, contains detailed descriptions of teachings and practice of the great ancient surgeon Acharya Sushruta. He has written about all the surgical diseases, their causes, types, prognosis and treatment, especially about the wounds. There are several Siddhanta or basic principles of Sushruta which are at the root of today’s surgery. Shashti-Upakrama is one among these principles. Shashti-Upakrama is the sixty types of treatment described for wound. Sandhan-Upakrama is one of them. Dalhana described the term Sandhana as unions of organs which are separated due to injury or trauma in his commentary. Today Sandhan is at its advanced position in the form of plastic and reconstructive surgery. But originally it was initiated with the Rhinoplasty operation performed by Sushruta called as Nasasandhan. Besides this, Sushruta has also performed KarnaSandhan (lobuloplasty) and Oshtha Sandhan. The aim of the study is to review the Sandhan-Upakram in historical (vedic) and ayurvedic texts and compare it with the present era’s plastic and reconstructive surgery.

Keywords: Sandhana karma, Plastic surgery, Reconstructive surgery, Nasasandhan, Osthasandhan

INTRODUCTION
Plastic surgery is a medical specialty deals with the repair, reconstruction or replacement of physical defects of form or function involving the face or other parts of body. The term plastic derived from Greek word Plastikos, meaning to mould. There are so many Samhitas and Granthis those are dealing with Ayurveda. Among them Charaka Samhita, Sushruta Samhita and Astanga Sangraha are the three main pillars of Ayurveda. Charaka Samhita and Astanga Sangraha mainly deals with medicine knowledge while Sushruta Samhita deals mainly with surgical knowledge. Complicated surgeries like Caesareans, Cataract, artificial limbs, fractures, urinary stones, plastic surgery (Sandhana Karma) procedures including pre-operative and post-operative treatment along with complications are written in Sushruta Samhita, which are surprisingly applicable even in present time. The plastic operation of ear (Otoplasty) and plastic operation of nose (Rhinoplasty) are
described in *Sutra sthāna* 16th chapter. Reconstructive plastic surgery is oldest type of surgery of the world. In older time, for giving punishment to the prisoners of wars and making marks for unfaithful wives amputation of nose and cutting of ear lobe, was done by kings. Surgeons were doing reconstructive surgeries for giving correction them. The procedure of Rhinoplasty was written in *Sushruta Samhita* which is almost 800 B.C old literature.

**References of Plastic and Reconstructive Surgery in Vedas**

Oldest references of *Sandhan karma* found today even before Acharya Sushruta, are of Vedic times. In Vedic era, science of *Sandhan karma* was also well developed. Ashwini kumaras were the chief surgeons of vedic period. There are so many examples of their work in the field of plastic surgery, surgery, Ophthalmology and orthopedic. Lord Shiva cuts the head of Ganesha in anger and after knowing the truth and on request they join the head of elephant to the Ganesha. This is oldest example of transplantation which is well known to us since childhood as told by our mothers and grandmother in stories. Bispala, wife of king Khela, lost her leg in war. Ashwini kumaras transplant her leg by an iron leg 1. The lost part of body of Rishi Atri was re-joined by Ashwini kumaras. The body of Acharya Shyaba was cut into three parts. Ashwini kumars rejoin the all parts and give him life immediately 2. Beside the Rigved, Padampuran also have written examples of reconstructive plastic surgery 3. Bhairav cut the head of Brhma and Dadhichi. Ashwini kumaras rejoined their head. They also transplant the head of Yahnya. Dadhyancha was the master of Madhu Vidya. Ashwini kumaras show them interest in learning Madhu Vidya. So they cut head of Dadhyancha and kept separate. Then they transplant the head of horse to the body of Dadhyancha and learn Madhu Vidya from them. After learn Madhu Vidya, they transplant his own head 4. Dakshya cut head and trunk of Chyavan. Ashwini kumaras performed the first plastic operation to join them. 5 According to Upanishad, Ashwini kumaras also operated and repaired the excised head of Yagyana by Rudra. Ashwini kumaras were doing both homo and hetero transplantations at that time.

**Concept of Plastic and Reconstructive Surgery in Ayurveda**

The origin of Ayurveda occurs from Vedas. It is also called fifth Veda. Ashwini kumaras are known as Dev Vaidya in Ayurveda. They have done excellent surgical work in Ayurveda. *Rigveda* is full of examples of their works. They operated the eyes of Reejashva. They also implanted the teeth of Phushna in his edentulous mouth. This knowledge of Ayurveda descends to the earth by Ashwini kumaras. Sushruta, people of Lord Dhanvantari, has written *Sandhan Karma* (Plastic Surgery) in *Sutra sthāna* 16th chapter. He elaborated Rhinoplasty for deformed nose, plastic surgery operation for deformed and cut ear lobules, corrective surgical procedure for cleft lip, injured lips and cleft palate. In the starting of 16th chapter, Acharya Sushruta first describe the method of piercing of ear lobe in infants for the purpose of decoration and giving protection from the grahama badha 6. This method is also used in children in present era. Often these ear lobules, due to the use of heavy ornaments, get considerably expanded and ultimately split. *Sushruta* has described fifteen methods of
joining these separated ear lobules.  

If a person without ear lobule come to a surgeon, then surgeon should reconstruct the ear lobule by taking a flap of skin from the cheek region; with a pedicle attached to the donor side.  

The aim of keeping the skin flap attached to the donor site with a pedicle to maintain the sufficient blood supply. By doing such process, three purpose will be solved. First there occur no complication, secondly the organ will vitalize with sensation and third, healing will be very soon. Same techniques with same manner are used in the present time.

**Techniques for Sandhana Karma of Ear lobes-Otoplasty**

There are fifteen operative methods to rejoin injured ear lobule.  

1. **Nemi Sandhanka**
2. **Utpala bhedyaka**
3. **Vallooraka**
4. **Aasangima**
5. **Gandakarna**
6. **Aaharya**
7. **Nirvedhima**
8. **Vyayojima**
9. **Kapata Sandhika**
10. **Ardha Kappata Sandhika**
11. **Sankhshipta**
12. **Heen Karna**
13. **Valli Karna**
14. **Kakaushtka**
15. **Yasti Karna**

Among them 10 techniques are successful, last 5 methods are unsuccessful.

**Indications for different methods of Karma Sandhana**

1. **Nemi Sandhanka**: This type of Otoplsty should be done when the both fragments of ear lobules are heavy and large in surface and also both are equal in shape and size.
2. **Utpala bhedyaka**: *Utpala bhedyaka* type of Otoplasty is indicated when cut ear lobule is equal in size and shape and both are large around.
3. **Vallooraka**: When cut fragment of ear lobules are small, round, equal in shape and size, Valloorka type of Otoplasty should be done.
4. **Aasangima**: Aasangima type of Otoplasty is indicated when proximal part of cut ear lobule is larger.
5. **Gandakarna**: Similarly when distal part of cut ear lobule is larger; this type of Otoplasty should be done.
6. **Aaharya**: This type of Otoplasty is suitable when both the fragment of cut ear lobules are absent.
7. **Nirvedhima**: Nirvedhima type of Otoplasty is indicated when both the fragment of cut ear lobules are absent from the root. In this type remaining part of Putrika (Tragus) is making base for surgery.
8. **Vyayojima**: Vyayojima type of Otoplasty is indicated when one part of cut fragment is larger than other i.e. both are dissimilar.
9. **Kapata Sandhika**: This type of Otoplasty is suitable when one fragment of cut ear lobule is longer from proximal side and second part is smaller.
10. **Ardha Kappata Sandhika**: Similarily Ardha Kappata Sandhika type of Otoplasty is indicated when outer fragment of cut ear lobules is larger in dimensions.

**Sandhana Karma of Nose (Reconstructive Rhinoplasty)**

After explaining the Otoplasty, **Sushruta** elaborate the reconstructive Rhinoplasty in same chapter. He given indication for nose either lost by disease or by trauma/accident. The portion of the nose to be covered should be first measured with a
leaf. Then a piece of skin of the required size should be dissected from the living skin of the forehead or cheek, and turned back to cover the nose, keeping a small pedicle attached to the cheek.

The part of the nose to which the skin is to be attached should be made raw by cutting the nasal stump with a knife. The physician then should place the skin on the nose and stitch the two parts swiftly, keeping the skin properly elevated by inserting two tubes of Eranda (the castor-oil plant) in the position of the nostrils, so that the new nose gets proper shape.

After this a powder of Pterocampus santalenus (Lal Chandan), Glycerrhiza glabra (Mulethi) and Rasot (extract of Barberis aristata) should be sprinkled over the operated area. Then the operated part should be covered with cotton pad or gauze pieces and irrigated with sesame oil frequently.

Ostha Sandhana Karma (Reconstructive Surgery of Cleft Palate)
Injured lip or congenital cleft palate is also reconstructed by same method as discussed above for Rhinoplasty in same chapter. The only difference is that in lip surgery there is no use of stem of Ricinus communis (Eranda naala). The Vaidya who get skilled in these reconstructive surgery, become Rajvaidya i.e. who can treat the king.

CONCLUSION
It is very difficult to say that when exactly the first plastic operation was done on man. Aacharya Sushruta has described various reconstructive methods and different types of procedures like taking a flap of skin from the cheek region, with a pedicle attached to the donor side.

If we observe carefully, then it is found that, all the basic principles of plastic surgery like planning, procedure and perfection has its roots in Sushruta Samhita. So it can be concluded that the source of plastic surgery is Sushruta Samhita, the great Indian Ayurvedic surgical literature, from here it spread worldwide.

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Source of support: Nil
Conflict of interest: None Declared