

# RIB GRAFT RHINOPLASTY FOR DEPRESSED DORSUM OF NOSE

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## ABSTRACT

**Objective:** To assess the results of the technique of Costochondral rib graft Rhinoplasty in patients with depressed dorsum of nose.

**Material and Methods:** This study was conducted in the Plastic Surgery Unit of PGMI, HMC from February 1997 to December 2002. It included all the patients with depressed dorsum of nose undergoing rib graft Rhinoplasty. A thorough history and physical examination with emphasis on the nasal deformity both from functional and cosmetic aspect was carried out. Both open and closed techniques of Rhinoplasty were employed. Photographs in standard frontal, lateral and worms eye view were taken. Record of patient's presenting complaints, patient's hopes and expectations, postoperative complications, patient satisfaction from cosmetic and functional point of view was made.

**Results:** During this period, 42 patients underwent procedure of rib graft Rhinoplasty. Male-female ratio was 1:1.1. Mean age for men was 31 years and for females was 25 years. Causative factors for depressed nose were trauma in 33(78%), congenital in 4 (9.5%), infection in 3 (7.1%) and Wegener's syndrome in 2 (4.7%) patients. Patient satisfaction was achieved in 28(66%) patients, 11(28.1%) had partly acceptable result while 3(7.1%) were not satisfied with the result. One patient had pressure ulceration at the bridge of the nose and one had undue elevation of nasal tip due to fibrosis. There were no significant long-term donor area complications.

**Conclusion:** Costochondral rib graft Rhinoplasty for depressed bridge of the nose is a safe option with minimal complications.

**Key Words:** Depressed Nasal Bridge, Rib Graft Rhinoplasty, Complications.

## INTRODUCTION

Nose occupies a central position on the face. Any deformity of the nose can lead to a functional and psychological disability.<sup>1</sup> Therefore attempts at restoration were made even thousands of years ago by Indian surgeons where it was a custom to amputate nose of people involved in adultery.

Surgical correction of nasal deformity is carried out to achieve:<sup>2</sup>

- Improvement of nasal breathing.
- Improvement of appearance.
- To improve mental well-being and confidence.

Depressed dorsum of nose can be:

1. Congenital. It can be a feature in a particular race or a family. However cosmetic Rhinoplasty is not offered in childhood as this procedure is carried out in adults who should

be self motivated with realistic expectation.

2. Infections: Both acute pyogenic infections and chronic Granulomatous infections like Syphilis, and tuberculosis can cause necrosis of the cartilage of nose and eventually collapse of the bridge of nose.
3. Granulomatous Disorders: Certain Granulomatous disorders like Wegners syndrome are well known for involvement of nasal bones and cartilage which can lead to collapse of the roof of the nose.
4. Trauma: Blunt, sharp, firearm injury or surgical trauma can all lead to depressed bridge of the nose.

Loss of support needs to be replaced to achieve correction of deformity. Various material are available to provide this support.<sup>2,3</sup>

In this study we evaluated the results of use of rib graft as support material. Particular note

was made of short term and long term complications and patient satisfaction both in terms of functional and cosmetic results.

## MATERIAL AND METHODS

This study includes all the patients who underwent rib graft Rhinoplasty in Plastic Surgery Unit of PGMI, Hayatabad Medical Complex, Peshawar from February 1997 to December 2002. A total of 120 rhinoplasties of various types including tip rhinoplasties, alar reductions etc were carried out during this period. Out of these 42 (35%) were rib graft rhinoplasties.

All patients presenting to our unit with depressed nose either through OPD or referred from other hospitals who opted for this procedure were included in this study. A thorough history with special record of patient's expectation was recorded. Physical examination with emphasis on the nasal deformity both from functional and cosmetic aspect was carried out. Photographs taken in standard frontal, lateral and worms eye view were taken. Procedure was explained to the patient and informed consent obtained.

All procedures were carried out under general anaesthesia and were covered by prophylactic intravenous antibiotics regimen of three dose co- amoxiclav. Preoperative sedation with tab Dormicum 7.5 mg in addition to IV antibiotics with a sip of water half an hour before surgery was given. Both open and closed techniques of Rhinoplasty were employed. Open technique was preferred in those cases where trauma or infection were the cause or where previous surgery had been performed i.e., 36 cases. Closed technique was used in congenital case and in cases with Wegener's syndrome i.e., 6 cases. Rib graft was harvested from 6<sup>th</sup> costal cartilage with a subperiosteal technique and the costochondral junction was included and used in such a way that bony part was employed for the dorsum and cartilaginous part for the columella. Nasal packing was employed for 48 hours and POP splint for one week to maintain the position obtained during surgery.

Patients were discharged after 48 hours when the packs were removed. First follow up was done on 8<sup>th</sup> day and splint removed. Patients were strongly advised to avoid smoke and smoking for at least two weeks, close physical contact and rigorous exercise for three months.

## RESULTS

During the study period, a total of 120 various rhinoplasty procedures were performed. Out of 120 patients, 42 (35%) patients had depressed dorsum of nose and all were offered rib

## AGE AND SEX DISTRIBUTION

Sex	Frequency n=42	Percentage	Mean age
Male	20	47.6	31 yrs
Female	22	52.3	25 yrs

Table 1

graft Rhinoplasty. No significant difference was recorded in M: F ratio, which was 1: 1.1. Mean age was higher for men, which was 31 years, and for females 25 years (Table 1).

Trauma was main cause of deformity in this study followed by patients who were born with this deformity (Congenital). Three patients gave history of acute necrotizing pyogenic infection, which was followed by collapse of the nasal bridge. In this study no patient had

## CAUSATIVE FACTORS

Cause	Frequency n=42	Percentage
Trauma	33	78
Congenital	4	9.5
Infection	3	7.1
Wegners Syndrome	2	4.7

Table 2

tuberculosis or syphilis as cause for this deformity. Another 2 patients had Granulomatous disease called Wegener's syndrome which is well known to involve bones and cartilage and can thus cause collapse of the nasal bridge (Table 2).

Thirty (71%) patients had purely cosmetic reasons for seeking the treatment as they were not satisfied with the appearance of their nose. Their motivations and expectation were thoroughly considered by an expert consultant and only then the procedure was embarked upon. Rest of the 12 (29%) patients also had a functional element i.e., blockage of the nose in addition to visible deformity.

Fifteen (35.7%) patients had undergone previous surgical procedures to correct their nasal deformity earlier a few of them actually attributed their deformity to those procedures. The rest of 27 (64.2%) had no history of previous surgical treatment for correction of the deformity.

Follow up ranged from 8 days to 4 years with a mean of 6 months.

Out of 42 patients, 28 (66%) patients were fully satisfied with the results achieved in terms of cosmesis and improvement in function ( Table 3). Eleven (26.1%) patients had reasons to be partly dissatisfied with the cosmetic appearance achieved after the surgery. Reasons recorded for

## PATIENT SATISFACTION

Results	Frequency n=42	Percentage
Satisfied	28	66
Partly satisfied	11	26.1
Not Satisfied	3	7.1

Table 3

dissatisfaction were:

1. Two patients did not achieve desired height of the dorsum.
2. Five patients complained of slight deviation of columella
3. Four patients had slight deviation of the dorsum of the nose.

However only two patients requested for revision surgery. One of the patient asked to augment the height of the nose while second patient underwent surgery for correction of columellar deviation.

Three patients were not satisfied by the final appearance of the nose achieved after the surgery. Causes for dissatisfaction included:

1. One patient had pressure ulceration at the bridge of the nose with partial extrusion of the rib graft. Rib graft was removed after conservative measures failed to heal the wound. At the same time a repeat of the procedure was performed which settled the problem.
2. Two patients were not satisfied with the cosmetic result. One patient was perhaps a case of poor case selection as her expectations were unrealistic and could not be matched. Other patient had undue elevation of nasal tip, which is a consequence of fibrosis following this type of surgery. None of these patients opted for a revisional surgery.

There were no significant long-term donor area complications like donor scar paraesthesia.

## DISCUSSION

Nose has aptly been described as a strange and most paradoxical organ of the human body with root (radix) above, its back (dorsum) in front, its wings (alae) below and one likes best to poke it in place where it does not belong.<sup>3</sup> It is that part of the body to which both sexes give most importance from appearance point of view. Any deformity or deviation from accepted normal appearance is considered a stigma. It is also a point of considerable attention from friends and foes. Chopping of the nose has been a custom all through the history as a punishment for various

acts. Patients have always sought for improvement in its shape and surgeons have been in quest for better methods refinement.

Depressed or saddle nose is considered to be significant cosmetic blemish specially with the modern Caucasian standards of beauty Negroes and Chinese race find their rather flat nose to be out of tune of normal standards of beauty.<sup>2,4</sup> Therefore there is an increasing demand on the plastic surgeons to increase the dorsal projection of the nose. To achieve this elevation various graft material and implants have been tried. Iliac crest bone graft is easy to harvest with ample amount of tissue available. Donor area scar is also well concealed. However it is difficult to mould and thin. It gives a rather crude shape and has no pliability.<sup>5</sup>

Outer table of cranial bones can also be used as donor area and has the advantage to be within the operative field and the scar is well hidden in hairline. On the other hand graft available is limited in amount and is quite brittle thus difficult to mould.<sup>2,6</sup>

Synthetic implants made of medical grade silicone too have the opponents and proponents. There is no limitation to the amount of material available (Not available in local market). Its shape can be custom made according to the individual needs of the patient and there is no donor area morbidity.<sup>10</sup> However incidence of infection ulceration and extrusion is higher as compared to autografts.<sup>7,8</sup>

Rib graft is easy to harvest and provides adequate amount of material, which is easy to shape and can be fixed at the recipient site with relative ease.<sup>5,9</sup> Costochondral junction can be used at the junction of tip and columella to give an aesthetically pleasing result and somewhat pliable tip.<sup>11</sup> Donor area morbidity due to long-term paraesthesia is the main drawback.<sup>12</sup> Donor site morbidity can be reduced by improvisation of technique in which a short incision is used and graft obtained by using a gouge.<sup>13</sup>

In this study main causes of depressed nose were trauma followed by congenitally depressed nose, acute pyogenic infection and autoimmune disorder, Wegener's granulomatosis.

All the patients were not satisfied with their appearance and wanted to have an improved appearance. 29% of the patient in addition to cosmetic problem had an element of obstruction of the airway, which needed correction.

Most (66%) of the patients were fully satisfied with the result and 28.1% patients were partly satisfied as they had some deviation of

dorsum or columella or expected projection was not achieved. Only 7.1% patients were not satisfied. There were no significant long-term donor area complications like donor scar paraesthesia. Most of the patients had some pain and paraesthesia initially however it settled in all patients with lubrication, massage and occasional use of benzodiazepines.

## CONCLUSION

It can be concluded that costochondral rib graft Rhinoplasty for depressed bridge of the nose is a safe option with minimal complications. Excellent results can be obtained in improvement in function, as all the patients in this series had satisfactory improvement in their nasal obstruction. Very good results were also achieved from cosmetic point of view, as most of the patients in this study were either fully or partly satisfied.

However one lesson to learn is to thoroughly assess the patient and his or her expectations. If the patient's expectations are unrealistic or externally motivated i.e. by friends or family then surgery should not be offered as such a patient is extremely difficult to satisfy.

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