ORIGINAL ARTICLE

Evaluation of closed Nasal Tip Rhinoplasty techniques

Munir Alam, Babar Rafiq Khan, Mian Farooq Ahmad

Abstract:

Background: Traditionally closed nasal tip rhinoplasty was used for minor tip problems. Albeit with infinite individual variations the open tip rhinoplasty procedures include cartilage excision with or without pocket grafts, suturing of the alar cartilages and a columellar strut and tip graft.

Purpose of the study: This study is to evaluate the most advance, minimal invasive closed tip rhinoplasty techniques performed either as combined procedure with septo-rhinoplasty or isolated nasal tip rhinoplasty under local anesthetic as an ambulatory procedure.

Study design: Cross sectional observational study.

Setting: Independent University Hospital, Faisalabad, Faisal Hospital, Faisalabad, Manzar Medical Centre, Faisalabad.

Period: The study period started from July 2016 to June 2019

Material and Methods: Independent University Hospital, Faisalabad. Total 20 patients, Septo-rhinoplasty with tiprhinoplasty in16-patients and only tip rhinoplasty in 4 cases. Faisal Hospital, Peoples Colony, Faisalabad. Total 36-patients, Septorhinoplasty with tip rhinoplasty in 5 patients and tip rhinoplasty in 31-cases. Manzar Medical Centre, Faisalabad. Total 10-patients, Septo-rhinoplasty with tip-rhinoplasty in 2-patients and tip-rhinoplasty in 8 cases. Minimum age patient was 8-years, maximum age 50-years with a mean age 32-years. The total number patients included in this study were 66 where 43(65%) patient underwent tip-rhinoplasty only. The techniques used for closed nasal tip-rhinoplasty were T zone excision, trans-columellar transcutaneous suture, columellar sliding, Serdev suture technique for nasal tip narrowing and alar base narrowing.

Results: The surgeon and patient satisfaction level achieved by using visual analogue scoring system at 3 months and 6 months post-operative interval were: IUH Faisalabad:90%, Faisal Hospital, Faisalabad: 90%, Manzar Medical Centre, Faisalabad: 60%. The total number of patients were 66. There were 14 male and 52 female patients in this study. Complications observed were fibrosis 1, suture extrusion 4, minor lump 2, further modification/improvement within 6-months in 2-patients.

Conclusion: Nasal tip cosmetic rhinoplasty is a work of art. By using advance minimally invasive techniques for closed nasal tip-rhinoplasty such as T zone excision, columellar sliding, Serdev suture technique for nasal tip and alar base narrowing achieved excellent result. We recommend these techniques, because, these procedures are a-traumatic, scarless, highly satisfactory, improve psychology, quick to perform as an ambulatory procedure under local anesthetic and does not require external plaster splint or nasal tampons post-operatively.

Keywords: Nose, tip, rhinoplasty, T zone excision, columellar sliding

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King Abdullah Hospital, Bisha
M Alam

Faisalabad Medical University, Faisalabad
BR Khan

Independent University Hospital, Faisalabad
MF Ahmad

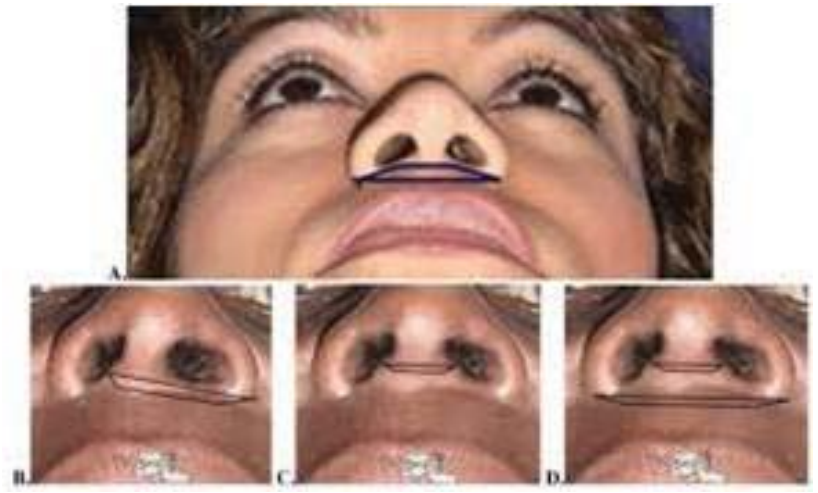
Correspondence:
Dr Munir Alam, Consultant Plastic Surgeon, King Abdullah Hospital, Bisha, Saudi Arabia
Associate Professor, Department of Plastic Surgery, College of Medicine, Bisha Medical University, Saudi Arabia
Cell No: +966 554984650
email: mrmuniralam@gmail.com

Introduction:

There are three objective for a cosmetic rhinoplasty need to be considered. The first step is to define the patient's desire. Normally the ideal

Figure 1

Figure 2



Hospitals	Gender Male/Female	Complete Rhinoplasty	Only Tip Rhinoplasty	Total Rhinoplasty
IUH	4/16	16	4	20
FH	5/31	5	31	36
MMC	1/9	2	8	10

nose fits in the middle 1/3rd of the face. Proper volumes are: thin dorsum, thin/narrow tip, narrow alar base. The nasal tip position should be in harmony with the beauty triangle of face which is the projected cheek bones and chin. The nasal tip should be in line with the prominences of bilateral cheek bones. The nasal dorsum should be straight in males and slightly concave (2-3 mm) in females.

Invariably nasal tip surgery was performed with open technique for maximum visibility and utilization of the techniques available in the past.[1] Even in the closed/open approach creation of the ideal dorsum set as closed technique, mostly the tip-rhinoplasty was done with open rhinoplasty technique. The cartilage excision performed through a closed approach with or without pocket grafts.[2] Suturing of the alar cartilages used to be performed via an open approach for nasal tip modification or open structure tip procedure with columellar strut and tip graft.[3]

In our experience more or less, the patient present for nasal tip modification with a broad, rounded or down turn nasal tip, wide ala as shown in figure 1 and 2 etc.

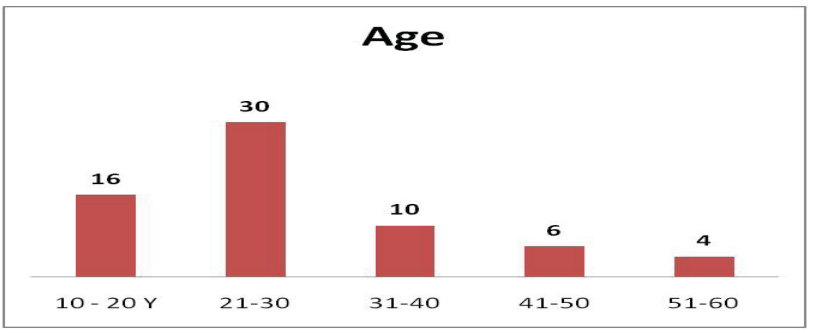
With the recent technique by utilizing Serdev sutures and instruments, it has become possible for all nasal tip modification to be performed as closed nasal tip rhinoplasty technique±correction of columellar and alar modification[4,7] as Figure-3). The techniques used for closed nasal tip rhinoplasty include T zone excision, trans-columellar transcutaneous suture, columellar sliding, Serdev suture technique for nasal tip narrowing and alar base narrowing.

The aim of Serdev Suture techniques in beautification rhinoplasty is to improve the aesthetic proportions, volumes, and angles of the nose, that fits to the face proportionally. These techniques are ideal for tip refinement and rotation, narrowing of the alar base and nasal dorsum lifting of concavities and irregularities.

Material and Methods:

This study was conducted at three different hospitals in Faisalabad, Pakistan, namely Independent University Hospital (IUH), Faisal Hospital (FH) and Manzar Medical Centre (MMC) period from July 2016 to June 2019. All the cases were performed by two specialty i.e; ENT and Plastic Surgery either under general anesthetic or local anesthetic. The complete rhinoplasty was performed under general anesthetic while nasal tip only rhinoplasty procedure was performed under local anesthetic.

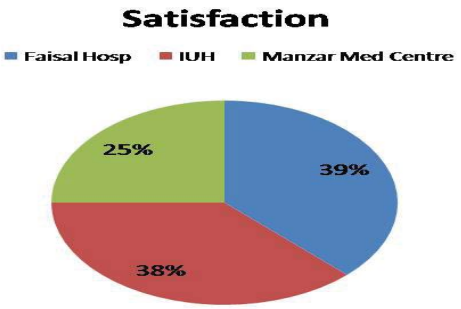
The inclusion criteria were all the patients of either gender with a variety of nasal defects present by birth (cleft nasal deformity), acquired or traumatic defects, for beautification rhinoplasty of nasal tip alone or complete rhinoplasty. Ex-



Graph 1: Age distribution

Table 1: Complications

Complication	Frequency	Percentage
Minor Lumps	2/43	4.7%
Suture Extrusion	4/43	9.4%
Revision Surgery	2/43	4.7%



Graph 2: satisfaction level chart

clusion criteria includes patients with the history of breathing difficulty, nose bleed, allergic rhinitis, head aches, nasal drug use (cocaine) etc and psychologically unfit patient who fall in the category of body dysmorphic disorder (BDD) syndrome were excluded from the study.

Thorough general physical examination of the face and local examination of the internal and external nose is performed including shape of the face, proportion of nasal bones, dental occlusion, nasal skin thickness, angles and proportions, nasal tip shape, intra-nasal examination for the valving, nasal septum, turbinate, and "Cottle Sign'. Minimum age patient was 8 years, maximum age 50 years with a mean age 32 years.

Results:

There were total number of 66 rhinoplasty procedures in this study from July 2016 to June 2019. Closed nasal tip rhinoplasty were performed in 43(65%) patients. The age ranges from 8-years to 55-years with a mean age 29 years as shown in graph-1. There were 14 male and 52 female patients in this study.

However, like any other surgical procedure closed nasal tip-rhinoplasty is not without any risk, the complications encountered in this study include minor lumps in 2(4.7%) patients, suture extrusion in 4(9.4%) patients, 2(4.7%) patients out of 43 required revision surgery for minor correction of deviation/lumps or to improve further shape of the nasal tip under local anesthetic within 6-months as shown in table-1.

The ethical approval from hospital committee was obtained and the satisfaction level were evaluated from the patient assessment. Post-operative results were evaluated with photographs of the nose in comparison to pre-operative photographs. The results were assessed by using visual analogue scoring system (by the doctor and patient) in the range of 1 to 10 where 10 is the maximum (100% satisfaction level).

The patient and doctor satisfaction level achieved by using visual analogue scoring system (Chart No 03) at 3 and 6 months interval post-operatively as shown in graph-2.

Discussion:

The art of the closed nasal tip rhinoplasty guided by correct nose proportions, angles, and volumes.

The innovation in the modern rhinoplasty techniques have made it possible for nasal tip modification. The techniques used for closed nasal tip rhinoplasty include T zone excision for tip rotation, trans-columellar tran-scutaneous suture, columellar sliding, Serdev suture technique for nasal tip narrowing and alar base narrowing.[4]

For nasal tip rotation, T-excision is performed by retero-collumelar incision extending into intra-cartilagenous supero laterally. The enbloc T-excision is performed with a blunt tip scissor

Figure-1: Curved, Elastic, Semi-blunt, mini Serdev R needle (Courtesy of Prof N Serdev)

Figure-2: Semi-elastic, absorbable, braided, anti-microbial, polyamide-silk thread (Courtesy of Prof N P Serdev)

keeping the dorsal skin intact. Further nasal tip modification, rotation and refinement is performed by Serdev Suture (Fig 1,2) technique where indicated. In our experience, Serdev suture technique provide scarless trans-cutaneous or trans-mucosal closed nasal tip-rhinoplasty.

The McCollough popularize the techniques of intra-operative suture for the nasal tip open rhinoplasty and to increase or decrease tip projection English double-dome unit procedure used and for further refinement horizontal mattress suture used through all 4 crura below the domes; with Goldman tip procedure for the wide or bulbous lobule, with Daniel domal creation suture, a horizontally placed mattress suture, which shaped each dome separately. Numerous suturing techniques appear in the literature regarding open technique rhinoplasty. All subcutaneous suture techniques listed above are used in open surgery.[7-17]

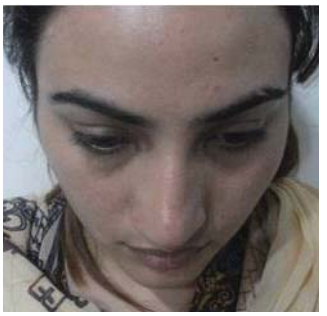
By using trans-cutaneous trans-domal suture of all 4 crura, nasal tip refinement is performed by semi-elastic Polycon sutures USP No 3 or 4 with 50mm curved semi-elastic Serdev® suturing instruments (figure 1 and figure-2). These sutures absorb over the period of 2 years, i.e., after final fibrosis is obtained and foreign materials are not a necessity. By keeping the cartilage into a more defined position for such a prolong period of time which keep the molded structures into new position thus the desired results are permanent. Non absorbable threads available are thin and sharp, may cut through the soft tissues and cartilages like scalpel.

Also the non-absorbable sutures are potential foreign bodiesand late complications may happen such as infection, foreign body reaction, and suture extrusion. The complications noted in our experience as shown in chart 3 The conventional absorbable suture get absorb before the tissue fixed into the final shape/position. The Serdev suture transcutaneous sutures does not include the skin in the stitches. With this cartilage suture technique brings the surfaces together and stimulates fibrosis, which guarantees the final result. Every technique is quite variable, sometimes modified and/or sometimes techniques are performed in combination. For refinement of the nasal tip, the author preference is the trans-domal technique of suturing all 4 crura. This method is very effective for narrowing the tip of nose. In addition, it could also be used to increase or decrease the tip projection. The skin perforation points are usually positioned the level of the tip point on either side, to insert a horizontal mattress suture through all 4 crura subdomally. It is a double dome suture to narrow the tip by bringing the domes together and keeping the structures together for a prolong period of time.

Surgical technique: The trans-domal suture uses 2 skin punctures and consists of 2 needle passes, sparing the skin on either side of nasal tip with number 11 blade. The Serdev needle pass percutaneous and a horizontal mattress suture used making a loop path through the cartilages. This technique facilitate the suture to be buried below the skin. It includes only cartilages, without including dermis or mucosa in the suture making the domal segment more convex and the adjacent lateral crura more concave. Skin and its perforations can be moved up and down the cartilages to obtain a distance of 2–3mm between the parallel passes. Both needle passes are placed in the domal area in such a way carefully avoiding breach of the nostril in order to prevent contamination and compromising the result. The suture could be placed 3–4mm posterior to the dome, to preserve keeping the alar domes separate. The degree of definition is controlled by how tight the suture is tied. Then the knots tied under a elastic tension and buried under the

Picture 3-a:Pre-op

Picture 3-b:6months post-op



Picture 3-c:Pre-op

Picture 3-d:Pre-op

Picture 3-e:Pre-op

Picture 3-:Pre-op

skin. The major modification is the use of sutures to narrow the domal segment rather than excision of the cartilages.

Alar base narrowing: The normal aesthetic angle should be 30° between the columella and lateral alae of the nostril. Alar base modification can be simple or complex, but should always be conservative, especially in ethnic unstable columella in Asian, Afro-American, and Latino-American patients. These patients may require additional procedure like stabilization of columella with Serdev suture and tip refinement with transdomal suture. Narrowing of the alar base provide additional effect on tip projection.

Resection and excision techniques of alar base are well known and applicable clinically. In numerous cases the author prefer Suture techniques in patients who reject excisions and scars (Fig 3). The suture technique is performed by horizontal mattress suture with 2 parallel passes (1–2mm distance between them), by 2 skin punctures at both nasolabial angles making the narrow nostrils (Fig 3 A), or unilateral in asymmetric cases (Figure 3). In order to avoid contamination, we recommend not to perforate the nostril, the suture placed caudal to the nasal spine subdermally.

These techniques are superior to traditional rhinoplasty technique because they are mini-invasive, atraumatic, time saving, yield excellent results with less than 0.003% complication rate.[6]

If the columella is wide due to very divergent footplates of medial crura, the suture technique can narrow the divergent end of columella, or any combination of the sutures above, including tip refinement.

Numerous suturing techniques appear in the literature regarding open technique rhinoplasty. The open approach consists of trans-columellar and bilateral marginal incisions, which allow the nasal tip skin to be elevated, permitting greater visualization and utilization of the nasal structures. With the McCollough and English double-dome unit procedure of intra-op suture technques of the nasal tip became popular to increase tip projection and refinement using a horizontal mattress suture through all 4 crura of the nasal tip; with Goldman tip procedure for the wide or bulbous lobule, with Daniel domal creation suture, a horizontally placed mattress suture, which shaped each dome separately. All subcutaneous suture techniques listed above are used in open surgery.[7-17] However, 2-basic techniques of doing the closed technique: transcartilagenous and delivery methods used in the literature in comparison to our closed approach where no such skin/mucosal incisions are made.

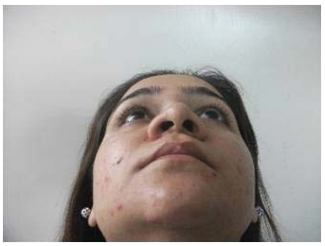
The author preference is to use Serdev suture (Picture 1,2) as separate procedures or as part of complex rhinoplasties. Their main indication

Picture 4a:Pre-op

Picture 4b:6months post-op

Picture 4c:Pre-op

Picture 4d:6months post-op



Picture 4e:Pre-op

Picture 4f:6months post-op

are tip rotation and refinement, alar base narrowing, dorsum asymmetries and deformities.

T-Excision for Nasal Tip Rotation: Invariably rotation of the tip shorten the length of the nose. The cephalic part of the greater alar cartilages, including unnecessary prominent caudal part of septum is excised (Fig 5).

First incision is sited at the junction of cartilaginous and membranous septum through and through with no 11 blade to separate the columella from the septum. To correct the drooping columella, the incision should leave an equal thickness along the length of the columella. The retro-columellar incision is then prolonged into trans-cartilaginous incision, which separates the cephalic and distal parts of lateral wing of the greater alar cartilage. The trans-cartilaginous incision is performed in each nostril through the opposite nostril, using the opening of the retro-columellar incision – this gives better visibility and permits better orientation. This incision make cuts to the combined mucosa and cartilages keeping the outer skin intact. To be precise, both alae nasi are held with thumb and index finger of the other hand, feeling the scalpel below the skin with the fingertips.

The second incision is performed for reduction of the length of the nose in the caudal septum region (Fig 5). The desired width of excised tissue guide the second incision line forming the medial excision triangle which is almost just above the nasal spine. This incision is again through and through with no 11 blade, including caudal septum. The inter-cartilaginous incision should be placed carefully minimum 2mm caudal to the internal nasal valve in order to prevent internal nasal valve stenosis and breathing difficulty. The 3 triangles of the "T-excision en bloc": two lateral triangles in the nostrils and one medial triangle in the septal retro-columellar part are excised in toto. The tissue of the "T-excision en bloc" is separated and removed by using blunt tip scissors, guided by the other hand to prevent the alar skin from injury. The surrounding skin is slightly undermined with the blunt tip scissors permitting rotation of the nasal tip and skin adjustment (Fig 5).

However, it is almost impossible to standardize operative techniques, as the nasal tip aesthetic problems, the surgeon's preferences and the selection of operative approach towards these techniques. With our wide range of nasal tip operations, over the years, we finally performing our closed nasal tip-rhinoplasty techniques in about 90% of primary cases, albeit with infinite individual variations.

Like any other surgical procedure, rhinoplasty is not without complications such as hematoma, scarring, infection, bruising & swelling, numbness and sensory changes, visual disturbances, anesthetic risk, asymmetry, lumps and bumps etc.

In the literature, most common reported com-

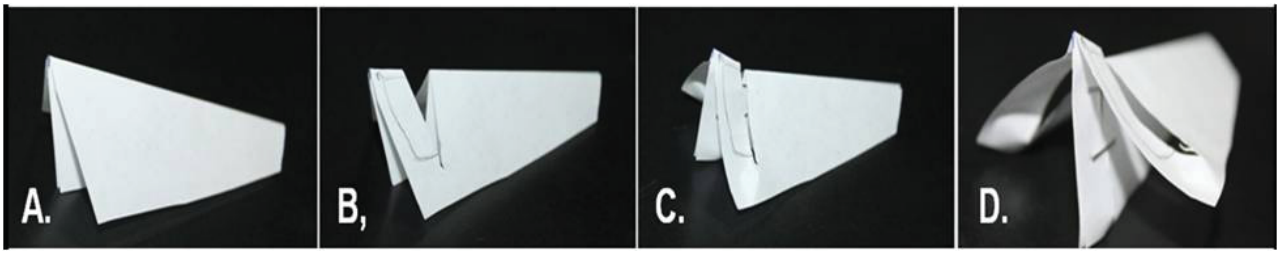


Figure 5: Excision for nasal tip

plication is breathing difficulty or blocked nose.[18-25] The most dreadful complication after rhinoplasty is the blindness.[26-30] However, some of the complication may be as a result of mistake in the pre-operative assessment or applying inadequate technique.[31,32] Appropriate pre-op, intra-op and post-operative measures and judicial use of antibiotic should be considered to avoid infection.[33]

In our series, we have encountered some minor complication with these modern, less invasive scarless techniques, and overall post-operative satisfaction rate remain highly satisfactory. Although highly satisfactory results are achieved, careful thorough psychological evaluation of the patient seeking aesthetic/cosmetic rhinoplasty is necessary, because the patients with body dysmorphic disorder (BDD) condition may remain unsatisfiedand are potential candidate for medico-legal issues.[34-36]

Conclusion:
Considering the obvious advantage of these advance mini invasive and time saving techniques with minimum or no complication, we recommend these innovative techniques due to their safety and no need of plaster and nasal tempons and early return to work and social life. Furtherance, improvement in the cosmetic appearance of nose improve the psychology of the patient.

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Role and contribution of authors:
Munir Alam, collected the data, references and wrote the article.

Babar Rafiq Khan, collected the data, references and helped in introduction and discussion writing.

Mian Farooq Ahmad, critically review the article and made final changes.

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