

Assessment of Incidence of Alar Cinching as an Adjunct Procedure in Orthognathic Surgeries Performed in Saveetha- An Institutional Experience

Dr. Senthil Murugan .P,
MDS, FCLPCS, Associate Professor,
Dept. of OMFS, Saveetha Dental College.

Abstract

➤ *Aim:*

This study aims at finding the incidence of Alar Cinching as an adjunct procedure in the Orthognathic Surgeries performed in Saveetha dental college.

➤ *Materials and Methods:*

All the patients reported to Saveetha dental college for surgical correction of facial deformities are considered and enrolled into this study.

All the patient details are collected and evaluated retrospectively from the patient records management software system of Saveetha Dental College.

Duration of the study: March 2019-March2020.

➤ *Results:*

Total of 31 patients were treated by various orthognathic surgical procedures. Out of these 31 cases, one patient treated by Posterior Maxillary Osteotomy and also another 10 patients treated with mandibular procedures are also excluded from this study. So 19 patients treated with Lefort I or AMO or Both are included in this study. The patient details and files are individually scrutinized by external reviewer to rule out bias. There were about 19 maxillary orthognathic procedures out of which 14 are AMO and 6 Lefort I procedures and in that only 9 patients underwent alar cinching. Statistics done using SPSS software and Chi square test done. The results showed that alar cinching as an adjunct procedure is statistically insignificant.

➤ *Conclusion:*

The above study shows that alar cinching is an adjunct procedure that can be performed to avoid nasal flaring following AMO and Lefort I Osteotomy.

Since the study is with limited population and ethnicity and also the sample size is very less, the results what we obtained even though seems to be insignificant can be ascertained by performing and continuing the study with increased sample size and proper Prospective Randomized Controlled Trial.

Keywords:- *Le fort I, AMO, Alar cinching.*

I. INTRODUCTION

Even though both Lefort and Anterior Maxillary Osteotomy are the procedures which are done to improve the facial esthetics, they themselves have the some disadvantages which will result in bad facial profile with unaesthetic nasal appearance.so the patient who are coming for facial cosmetic corrections for prognathic maxilla may feel unsatisfied or even weird sometimes because of the appearance of nose after Lefort I or AMO superior impaction and setback or Lefort I advancement.so Le Fort I superior impaction osteotomies are known to produce an detrimental effect on soft tissues of orofacial region like widening of the alar base, loss of vermilion show of the upper lip and down sloping of the angle of the mouth[1]

This mainly occurs due to flaring of bilateral alar cartilages .The alar cartilages gets detached from the alar base during dissection around the bilateral piriform aperture and osteotomy .after super impaction and posterior setback, if the alar cartilages are not brought into original position in the alar base, the alar width will become widened which may lead to flaring of alar base. This is will give wide nasal width appearance after surgery. Since nose is the prominent structure of appearance in face, this will give patient a quick unesthetic look post operatively.

So, to prevent this alar cinching done with suturing of alar cartilages with the alar base and stabilizing it.

A. *Surgical technique:*

Two types of cinching are usually followed worldwide. They are

- Classic Alar Cinching.
- Modified Alar Cinching.

Apart from this, there are so many modifications put forward by different surgeons worldwide.

Xianwen Liu [2] et al in their systematic review comparing different types of alar cinching has explained the different types of suturing as diagramatic representation very nicely and clearly.

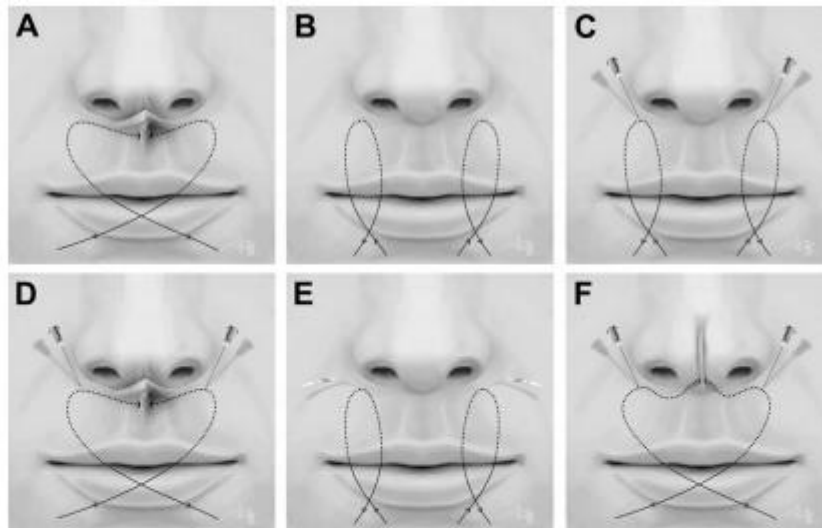


Fig. 1 Illustrations of classic and modified alar base suture techniques. **A**, Classic alar cinch suture adopted in the study by Rauso et al. (2010),⁸ which involved anchoring the fibroareolar tissues directly under both alar and passing suture through the nasal spine. **B**, Classic alar cinch suture adopted in the study by Ritto et al. (2011),⁹ which involved anchoring the fibroareolar tissue intraorally under both alae separately. **C**, Classic alar cinch suture adopted in the study by Nirvikalpa et al. (2013),¹⁰ which involved using hypodermic needles under both alae to accurately identify the nasofacial skin fold; a thick suture bite was taken at this point. **D**, Modified alar cinch suture adopted in the study by Rauso (2010),⁸ which involved a reinsertion method by using hypodermic needles under both alae and passing the suture through the nasal spine. **E**, Modified alar cinch suture adopted in the study by Ritto et al. (2011),⁹ which involved a reinsertion method by using curved needles to anchor the fibroareolar tissue under both alae separately. **F**, Modified alar cinch suture adopted in the study by Nirvikalpa et al. (2013)¹⁰ which involved using hypodermic needles under both alae to accurately identify the nasofacial skin fold; a thick suture bite was taken at this point, then the suture was passed through the nasal septum.

Fig 1

II. MATERIALS & METHODS

All the patients reported to Saveetha Dental College for surgical correction of facial deformities are considered and enrolled into this study.

All the patient details are collected and evaluated retrospectively from the patient records management software system of Saveetha Dental College. [DIAS].

Duration of the study: March 2019-March2020.

➤ Inclusion Criteria:

All Lefort I and Anterior Maxillary Osteotomy patients.

➤ Exclusion Criteria:

- Patients with repeat and incomplete data.
- Mandibular orthognathic Procedures like BSSO [Lower Arch].

So, a total of 31 patients re enrolled in the study. Out of which 15 are Male and 16 are female patients. Patients with incomplete and repeat data were excluded from the study. Out of these 31 cases, one patient treated by Posterior Maxillary Osteotomy and also another 10 patients treated with mandibular procedures are also excluded from this study.so 19 patients treated with Lefort I or AMO or

Both are included in this study. There were about 19 maxillary orthognathic procedures out of which 14 are AMO and 6 Lefort I and in that only 9 patients underwent alar cinching. Statistics done using SPSS software and Chi square test done. The patient details and files are individually scrutinized by external reviewer to rule out bias. The case sheets are reviewed for the assessment parameters like Age, Gender, Type of Jaw involved in the surgery and whether Alar Cinching is done or not. All datas are formulated in excel sheet and statistics done through SPSS Chi Square Test. The Results are tabulated.

III. RESULTS

So a total of 31 patients were treated by various orthognathic surgical procedures. Out of these 31 cases, one patient treated by Posterior Maxillary Osteotomy and also another 10 patients treated with mandibular procedures are also excluded from this study.so 19 patients treated with Lefort I or AMO or Both are included in this study. The patient details and files are individually scrutinized by external reviewer to rule out bias. There were about 19 maxillary orthognathic procedures out of which 14 are AMO and 6 are Lefort I procedures, and in that only 9 patients underwent alar cinching. Statistics done using SPSS software and Chi square test done. The results showed that alar cinching as an adjunct procedure is statistically insignificant.

The Results are tabulated as follows

Age Group	n	%
17 - 20	4	21.1
21 - 25	5	26.3
26 - 30	7	36.8
31 - 35	2	10.5
36 - 40	1	5.3
Total	19	100.0

Table 1

Gender	n	%
Male	6	31.6
Female	13	68.4
Total	19	100.0

Table 2

Age Group	Field Value		Total
	No	Yes	
17 - 20	2	2	4
21 - 25	3	2	5
26 - 30	2	5	7
31 - 35	2	0	2
36 - 40	1	0	1
Total	10	9	19

Chi Square: 0.349

Table 3

Gender	Field Value		Total
	No	Yes	
Male	4	2	6
Female	6	7	13
Total	10	9	19

Chi Square: 0.370

Table 4

Correlations				
		Age	Gender	FieldValue
Age	Pearson Correlation	1	-.294	-.167
	Sig. (2-tailed)		.222	.493
	N	19	19	19
Gender	Pearson Correlation	-.294	1	.191
	Sig. (2-tailed)	.222		.434
	N	19	19	19
Field Value	Pearson Correlation	-.167	.191	1
	Sig. (2-tailed)	.493	.434	
	N	19	19	19

Table 5

Age Group	Gender		Total
	Male	Female	
17 – 20	0	4	4
21 – 25	1	4	5
26 – 30	4	3	7
31 – 35	1	1	2
36 – 40	0	1	1
Total	6	13	19

Table 6

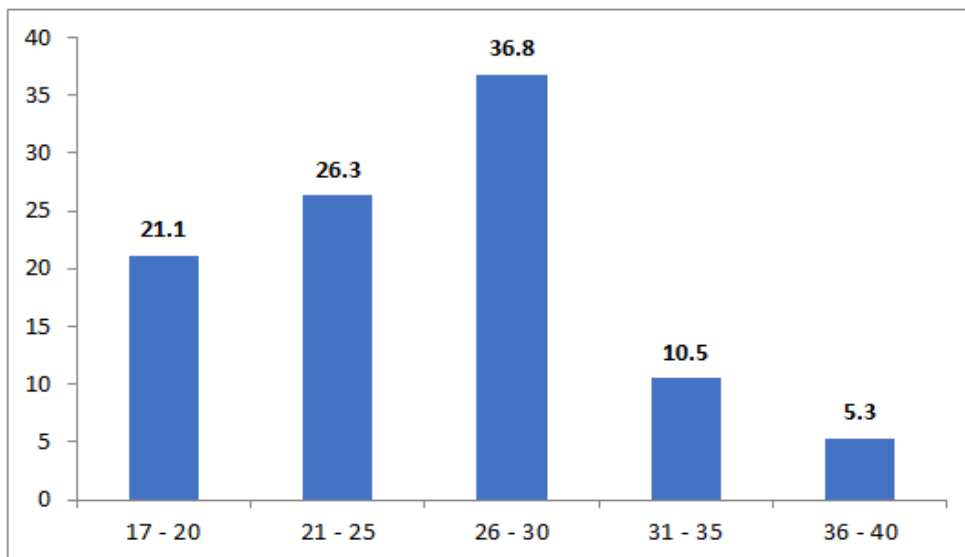


Fig 2:- Age Group & Percentage
X –Axis –Age group & Y axis-Percentage

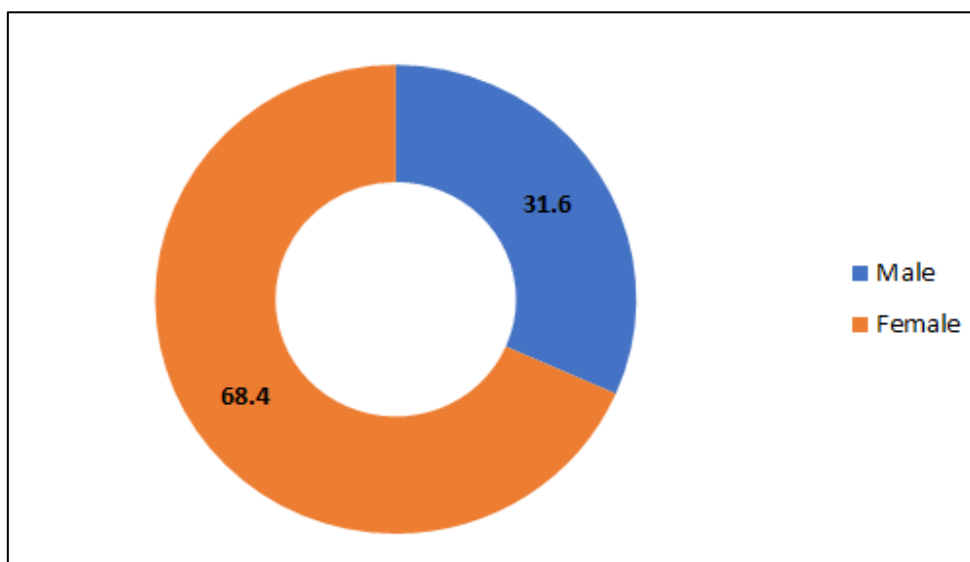


Fig 3:- Gender Percentage.

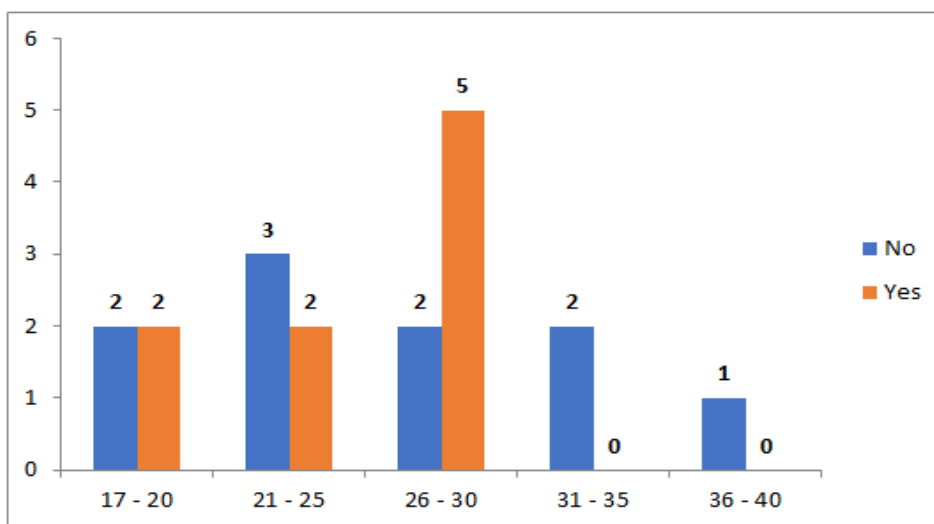


Fig 4:- Age Group Vs Alar Cinching:
Chi Square: 0.349

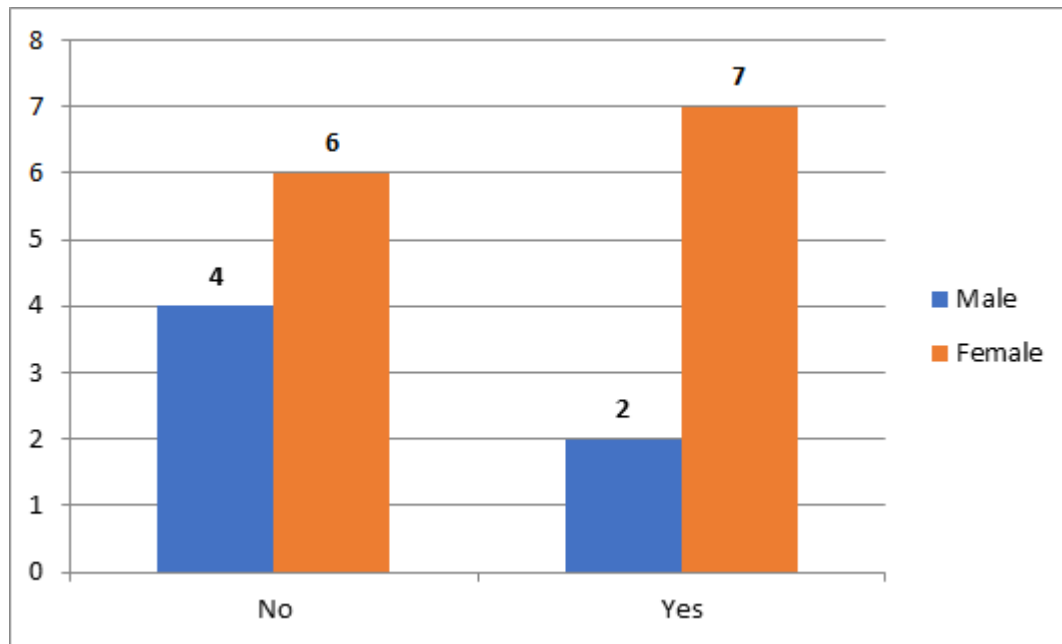


Fig 5:- Gender Vs Alar Cinching
Chi Square: 0.370

IV. DISCUSSION

There are some soft tissue changes associated with Le Fort 1 osteotomy, which are tough to control due to appreciable alteration in their adaption. These changes include alar flaring, adverse changes of the nasal tip with tip turned upwards, and flattening of the lip and increased naso-labial angle may occur. So to overcome these effects some adjunct soft tissue procedures on the nose can be performed during Le Fort 1 osteotomy like alar cinch suture, resection of the anterior nasal spine, wedge excision of the alar base, grinding of the paranasal area, and thinning of the columella [2].

There are so many articles which have studied the nasal change width after Lefort procedures, including alar flaring or widening after a Le Fort 1 osteotomy. These changes for sure will have a strong negative effect on the overall facial appearance and especially in patients with a wide nasal width [3].

In patients with vertical maxillary excess and nasal width and nostrils, the postsurgical widening of alar width following Lefort I superior impaction and set back may be beneficial. However, in cases of preexisting wide alar base patients, the same soft tissue changes may become undesirable and unaesthetic, especially with anterior or superior repositioning of the maxilla. Bell and Profit suggested that at time of preoperative assessment, patients with a wide nose be warned that a rhinoplasty may be indicated soon [4].

Each movements of the maxilla in different direction during maxillary orthognathic surgeries will have an impact on the morphology of nasal base. Elevation of the nasal tip, widening of the alar bases, and a decrease in the naso-labial

angle all may results because of superior repositioning of maxilla. [4].

There may be a reduction in the depth of the nasal aperture following Le Fort 1 osteotomy with superior repositioning of the maxilla. This results in inadequate space for the alar base to occupy. because of this, there is lateral pushing of the muscles of naso labial region. This finally results in increased inter alar distance and nasal flaring after surgery. The widening of nose depends partially on skeletal movements, but mainly on sub periosteal reflection which make the facial muscles to get detached from the naso-labial area and the anterior nasal spine. so there is detachment of nasolabial muscles from its origin and also it tends to get reattached at different shortened length due to its retraction and contraction. This lateral stretching of the muscles results in nasal flaring, widening and elevation of the alar base as well as nose, which is frequently Asymmetric [5].

Stewart and Edler [6] has used sub mental intubation for their orthognathic surgeries in 36 patients and studied the effect and stability of alar cinching with measurement of inter alar width before ,intra op and one year post op .They found that sub mental intubation has helped in accurate measurement of alar width changes.

Maurice [7] described an essential point by stating that rotation of the palate during Lefort surgeries does have significant effect on the soft tissue of the naso-labial region, also stating that changes in the lateral position of the pyriform aperture have significant effect on the soft tissue of the nasal base.

Shoji et al. [8] has proposed a modified technique for symmetrical alar cinching after changing the nasal intubation to oral intubation while doing cinching. In their study with 30 patients he found that there is no change in alar width even after one year review, even though there is significant increase in nasal tip projection and nasal labial angle.

Harvey Rosen [9] article states that increase in alar rim width accompany superior and anterior repositioning of the maxilla. Guymoon et al. [8] study showed that there is a mean increase of inter alar distance by 10.75 % compared to patients with an adjuvant procedure where the mean increase was only 2.89 % in patients undergoing maxillary superior repositioning procedures.

Howley et al. [10] concluded that the alar cinching provides minimal benefit in controlling the width of the alar base of the nose after Le Fort I osteotomy. They also concluded that greater stability can be achieved by a modified cinch suture.

Guymoon et al. [11] suggested that patients undergoing maxillary osteotomy with superior repositioning showed a mean increase in inter alar width by 10.75 % in cases without an adjuvant procedure as compared to patients with an adjuvant procedure where the mean increase was only 2.89%.

There are so many different techniques of alar cinching in literature. All these can either be used alone or we can combine the different techniques also. Some of the techniques are as follows, partial or total resection of the anterior nasal spine in combination with an alar base cinch suture [7] alar base cinch suture [10], suturing through the Nasalis muscle along with V-Y closure. [12].

Westermarck et al. [13] has found from his study that the alar cinching has reduced alar flaring but it also increased the naso-labial angle but there is no significant influence on nasal tip projection.

V. CONCLUSION

In our study with 31 patients, only 19 maxillary osteotomies were performed and in that also only in 9 patients alar cinching done. So we concluded that alar cinching is one of adjunct procedures to be followed during maxillary orthognathic surgeries even though there is no incidence of Re surgeries or correction surgeries like rhinoplasties.

We conclude that Le Fort I osteotomy (superior repositioning) and Anterior Maxillary Osteotomy leads to a widening of alar base. Alar cinching prevents the lateral pulling of the naso-labial muscle and thereby reducing the postoperative nasal flare significantly and so stabilizing the maximum possible inter alar width.

Cinch suture as an adjuvant procedure does not eliminate post-operative alar flare completely because it does not address the other contributing factors like the loss of pyriform depth and septal resection, which needs further evaluation.

The above study shows that alar cinching is an adjunct procedure that can be performed to avoid nasal flaring following AMO and Lefort I Osteotomy.

➤ Limitations of the study:

Since the study is with limited population and ethnicity and also the sample size is very less, the results what we obtained even though seems to be insignificant can be ascertained by performing and continuing the study with increased sample size and proper Prospective Randomized Controlled Trial to analyze the real effect of alar cinching.

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