

**Original Article****A comparative study of frontalis sling surgery for simple congenital ptosis: use of autogenous fascia lata compared with silicon rod**

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**ABSTRACT**

**Background:** Drooping of the upper eyelid is one of the most common complaints in oculoplastic practice. Ptosis causes cosmetic deformity that is apparent both to the patient and to others. Frontalis suspension is a commonly used surgery that is indicated in patients with severe ptosis with poor levator muscle function.

**Aim:** To evaluate the result of frontalis sling surgery, autogenous fascia lata compared with silicon rod in virtue of amount of lid lag, lagophthalmos, cosmesis and recurrence.

**Method:** It is a prospective, non-randomized, interventional study of patients having unilateral or bilateral moderate to severe ptosis with poor levator function. A total 94 eyes were operated for frontalis sling surgery with a single pentagon (Fox) technique. Two groups classified – 54 unilateral eyes with silicon rod and 40 bilateral eyes with autogenous fascia lata. Patients evaluated till 6 months.

**Results:** The results were compared in terms of cosmetic and functional success. The silicon sling group showed reduction in lid lag and lagophthalmos, which was extremely significant. But cosmesis and recurrence rate was similar in both groups.

**Conclusion:** Frontalis sling surgery with silicon rod can be the procedure of choice for severe unilateral or bilateral ptosis with similar cosmetic and functional outcomes.

**Keywords:** Ptosis, Sling surgery, Silicon rod, Cosmetic

**INTRODUCTION**

Drooping of the upper eyelid is one of the most common complaints in oculoplastic practice. Ptosis causes cosmetic deformity that is apparent both to the patient and to others. Frontalis suspension is a commonly used surgery that is indicated in patients with severe ptosis with poor levator muscle function. It forms a link between the frontalis muscle and the tarsus of the upper eyelid. Thus eyelid elevation is performed with the use of the frontalis muscle. Frontalis suspension surgery can be done by several surgical techniques and materials like autogenous fascia lata, polypropylene, silicone, stainless steel, silk, nylon, polyester and Poly Tetra Fluoro Ethylene (PTFE).

The aim of our study is to evaluate the result of frontalis sling surgery, autogenous fascia lata compared with silicon rod, to study the cosmesis & recurrence and to compare the amount of lid lag and lagophthalmos.

**MATERIAL & METHODS**

It is a prospective, non-randomized, interventional study. A total 94 eyes of 74 patients had undergone the frontalis sling surgery with a single pentagon (Fox) surgical technique at our centre. The patients were classified in two groups - 54 eyes with silicon rod & 40 eyes with autogenous fascia lata.

Patients with following criteria included

- Unilateral or bilateral severe ptosis
- Poor Levator function (< 4 mm).

Basic details of the patient, history, visual acuity, examination of ptosis, ocular movements and examination of anterior and posterior segment were carried out. The pre-operative consent, routine investigations and fitness for anesthesia was taken. Patients evaluated on 1<sup>st</sup> post-operative day, 3<sup>rd</sup> month and 6<sup>th</sup> month.

Lid contour is classified in terms of eyelid height asymmetry in bilateral cases and lateral drooping, lid notching in unilateral cases. Recurrence is defined as change of results from good to fair or poor over a period of 6 months. Possible post-op complications like corneal exposure, entropion, lash ptosis, over or under correction were reported.

**RESULT**

Mean age in our study was 15.44 ± 9.5 years with minimum age was 7 years and maximum age was 45 years [Table 1].

**Table 1: Division of patients eyes according to implant material**

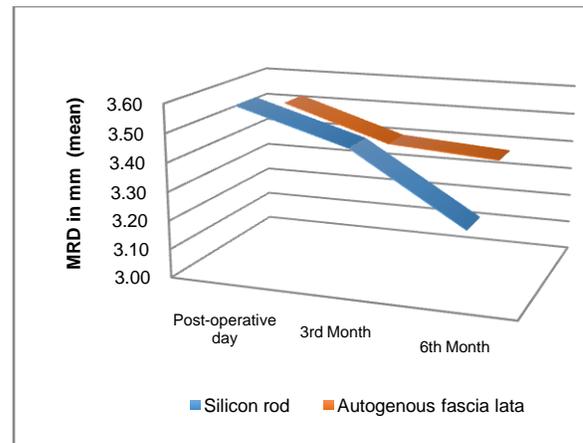
Implant material (Sling)	No of eyes	%
Silicon rod	54	57.45
Autogenous fascia lata	40	42.55
<b>Total</b>	<b>94</b>	<b>100</b>

Patients were divided in 3 groups (Where, Good: MRD ≥ 3 mm, Fair: MRD 2 - 2.9mm, Poor: MRD < 2 mm). The mean MRD - 1 in silicon rod group were 3.58 at 1<sup>st</sup> post-operative day, 3.47 at 3<sup>rd</sup> month and 3.24 at 6<sup>th</sup> month which showed a decline more as compared to autogenous fascia lata group 3.52 at 1<sup>st</sup> post-operative day, 3.40 at 3<sup>rd</sup> month and 3.38 at 6<sup>th</sup> month [Chart 1].

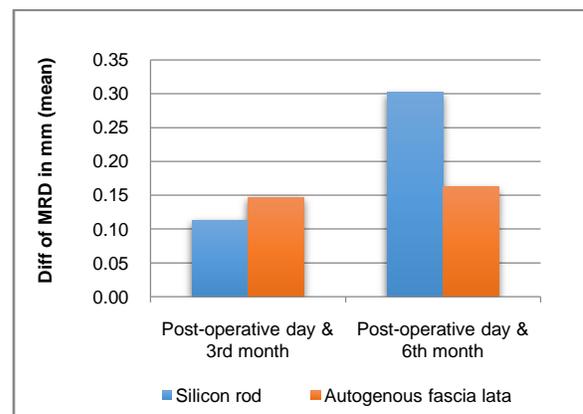
Postoperative changes in MRD - 1 over 6 months were compared between two groups at 3<sup>rd</sup> month and 6<sup>th</sup> month keeping 1<sup>st</sup> post-operative day findings as baseline, applying un-paired t test (Mann Whitney test). The silicon rod group showed a mean MRD - 1 decline of 0.34 mm over 6 months while in fascia lata group it was 0.14 mm. P value at 3 months and 6 months was 0.72 and 0.23 which was not significant statistically [Chart 2].

The silicon rod group showed an average follow-up reduction in lid lag of 1.83 mm as compared to fascia lata group of 0.70 mm, which was extremely significant [Chart 3].

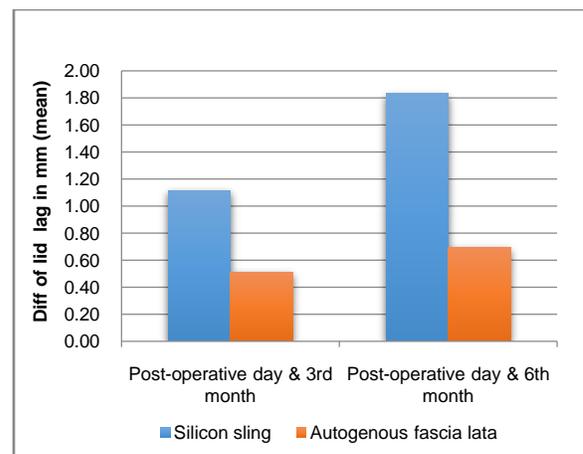
**Chart 1: Mean MRD - 1 at different follow ups and their trend**



**Chart 2: Comparison of MRD - 1 between two groups**



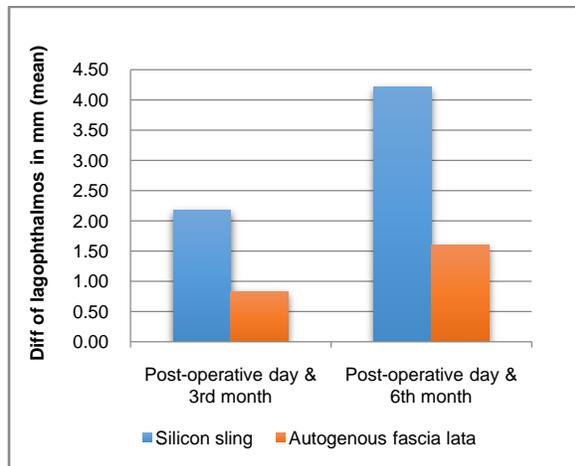
**Chart 3: Comparison of lid lag between two groups**



The silicon rod group showed an average follow-up reduction in lagophthalmos of 4.21 mm as compared

to fascia lata group of 1.60 mm, which was extremely significant [Chart 4].

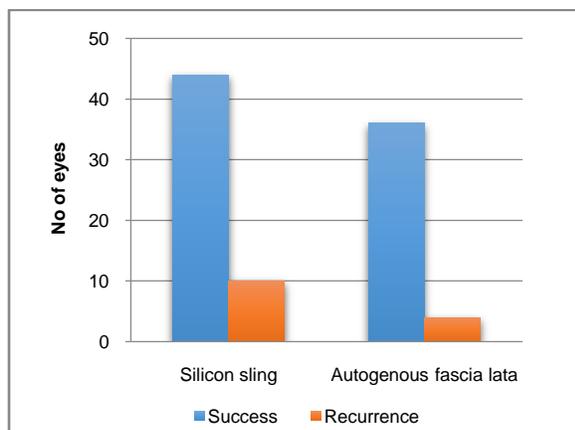
**Chart 4: Comparison of Lagophthalmos between two groups**



Thus, silicon rod group showed better improvement in lid lag and lagophthalmos in comparison to fascia lata group.

The result was comparable in both groups in terms of lid contour. The lateral drooping and notching was seen in patients where recurrence was found on follow-up [Chart 5].

**Chart 5: Recurrence of ptosis at 6 months**



The difference between recurrences in two groups was not statistically significant. ( $Y^2 = 0.48$ ). None of the patient from both groups developed any complications.

## DISCUSSION

In our study no statistical significant difference found in terms of functional and cosmetic success between autogenous fascia lata and silicon rod groups. In our study silicon rod group showed a mean MRD - 1 decline of 0.34 mm over 6 months while in fascia lata group it was 0.14 mm. P value at 3 months and 6 months was 0.72 and 0.23 which was not significant statistically. Silicon rod is cost effective due to the shorter operating room time and without any co-morbidity at a second surgical site.

Lee MJ et al found that cosmetic results were not significantly different between the two groups at 3 and 6-months [1]. Chi-Ting Horng et al showed that congenital ptosis necessitating corrective surgery at a very young age 3-5 and silicone rods is an effective material in frontalis suspension in this age [2].

An autogenous sling meets two characteristics of the ideal suspension material: biocompatibility and stability. Once it has been put in, it has been shown that it integrates fully into the tissue, and in fact revision might be a little more difficult because of that. Ben Simon GJ et al showed similar success rates were achieved with different suture materials, which included autogenous fascia or alloplastic material [3]. Wasserman BN et al found that low incidence of recurrence was found in autogenous fascia lata group as compared to other sling materials [4]. Orlando F et al demonstrated that Histopathological findings in such cases have shown that the scarring of the fascia was demonstrated long after surgery [5].

In our study silicon rod is beneficial for better post-operative lid lag and lagophthalmos. And no significant difference found in recurrence between autogenous fascia lata and silicon group. The silicon rod group showed an average follow-up reduction in lid lag of 1.83 mm as compared to fascia lata group of 0.70 mm, which was extremely significant. The silicon rod group showed an average follow-up reduction in lagophthalmos of 4.21 mm as compared to fascia lata group of 1.60 mm, which was extremely significant. The results were comparable in both groups with respect to lid contour.

M Subramanyam et al showed that silicon has a positive role in the treatment of ocular Myopathy and the absence of Bell's phenomenon is not an absolute contraindication [6]. J.Ahn et al showed that frontalis sling surgery using silicone rod can safely and effectively correct ptosis in chronic progressive external ophthalmoplegia patients without serious corneal complications [7].

## CONCLUSION

Frontalis sling surgery with silicon rod can be the procedure of choice for severe unilateral or bilateral ptosis with similar cosmetic and functional outcomes.

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