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ORIGINAL ARTICLE

Comparison of silicone rod versus prolene 4/0 suture in frontalis suspension surgery for simple congenital ptosis.

Maqbool-ur-Rehman[1], Ubaidullah[2], Aeeza Malik[3], Bakht Samar Khan[4], Ahmad Jamal[5], Jawad Humayun[6], Mushtaq Khalil[7], Ansa Benazir[8]

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ABSTRACT… Objective: To compare the frequency of good functional outcome of frontalis suspension surgery using silicone rod versus prolene 4/0 suture in simple congenital ptosis. **Study Design:** Hospital Based Comparative Study. **Setting:** Department of Ophthalmology, Khyber Teaching Hospital, Peshawar. **Period:** June to August 2018. **Material & Methods:** This study was performed on 70 randomly selected patients divided in two groups (A and B) having 35 patients in each group. Patients with poor levator function (≤5mm), moderate to severe ptosis and good Bell's phenomenon of either gender having age range of 5-25 years were included in the study. Good functional outcome was considered as achieved when the marginal reflex distance is more than or equal to 1 mm, and was considered as not achieved when the marginal reflex distance is less than 1 mm on physical examination after 3 months of the procedure. **Results:** In Group A, mean age recorded was 12+6.31 while mean duration of procedure was 52+3.08. In Group B, mean age was 15+4.76 and mean duration of procedure was 55+1.82. A total of 88.5% and 62.85% patients achieved good functional outcome in Group A and B respectively. Stratification of good functional outcome with respect to age shows that good functional outcome is statistically significant in the age group of 16-25 years. **Conclusion:** In simple congenital ptosis, prolene 4/0 suture achieved good functional outcome and an excellent safety profile in comparison to frontalis suspension using silicon rod.

Key words: Functional Outcome, Frontalis Suspension, Simple Congenital Ptosis, Silicon Rod.

INTRODUCTION

Ptosis is also referred to as blepharoptosis. Ptosis is a word of Greek origin having the meaning of "fall in". Ptosis takes place when the upper eyelid of a single or both eyes fall down to the lower position, which is an ocular condition. The upper eyelid edge generally rests around 1–2 mm beneath the upper limbus. Ptosis at birth is congenital ptosis and if it occurred later in life is called acquired ptosis. The adverse effect of congenital ptosis can result in deprivation amblyopia and, in some bilateral cases, it may lead to cervical spine deformities, congenital ptosis is treatable at an early age followed by the treatment of amblyopia.[1-2] Congenital ptosis affects children with unilateral and bilateral ptosis seriously by experiencing crawling and walking problems.[3] The fundamental etiology behind ptosis is the shortcoming of both of the two lifts of the upper cover that involve muller muscle and levator palpebrae superioris. Ptosis can be arranged based on etiology into different categories e.g neurogenic, mechanical, aponeurotic traumatic, and myogenic.[4-5]

Health care professionals usually recommend surgical intervention for the treatment of ptosis to tighten levator muscle and to lift the eyelid to the normal point.[6] The function of the levator and condition of ptosis dictates which kind of surgical procedure is required to fix it. To treat the levator function the common surgical interventions are levator aponeurosis advancement, brow suspension, Fasnella Servat procedure, Muller's muscle resection.[7] Frontalis suspension for the upper lid is considered to be one of the effective

1. FCPS, Assistant Professor Ophthalmology, Khyber Teaching Hospital, Peshawar.
2. FCPS, Assistant Professor Ophthalmology, Hayatabad Medical Complex, Peshawar.
3. MDS, Associate Professor Research, Multan Medical and Dental College, Multan.
4. FCPS, Associate Professor Ophthalmology, Khyber Teaching Hospital, Peshawar.
5. FCPS, Assistant Professor Ophthalmology, Hayatabad Medical Complex. Peshawar.
6. FCPS, Assistant Professor Ophthalmology, Khyber Teaching Hospital, Peshawar.
7. FCPS, Assistant Professor Ophthalmology, Khyber Teaching Hospital, Peshawar.
8. BSc Vision Sciences, MPH, PPDO Clinical Optometrist, Khyber Teaching Hospital, Peshawar.

Correspondence Address:
Dr. Aeeza Malik
Department of Research
Multan Medical and Dental College.
aeezamalik@gmail.com

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treatment.[8] This method is a gold standard and frequently adopted technique while treating low levator function and serious ptosis for patients suffering from acquired and congenital causes.[9]

While considering brow suspension, different types of suspension materials are generally used i.e, Gore-Tex strips, temporalis fascia, poly-filament sutures, sclera, fascia lata, silicone rod, and prolene.[10-16] While treating congenital ptosis brow suspension along with autogenous fascia lata is an effective and widely used technique in the lifting of the upper eyelid. The use of silicon rod showed good results in various cases of congenital ptosis while handling frontalis suspension and inadequate levator function. The surgical time required for silicon frontalis sling is less accompanied by small incisions to the skins, silicon rods are found to be effective for frontalis suspension.[17]

In children for the prevention of amblyopia, prolene is used which is not a permanent suspension material but the suture of polypropylene minimizes the problems related to soft tissues, less complications during removal, and minimal risk for scarring is noted, in addition it has been observed that it does not make issues for fascia lata in the future.[18]

The treatment of the Ptosis requires accurate and consistent evaluation and measurement as well as skillful use of surgical technique to implement a functional and aesthetic correction. Result of international studies cannot be generalized on our population due to confounding variables and genetic variations. Therefore, this study was planned with an objective to compare the frequency of good functional outcome of frontalis suspension surgery using silicone rod versus prolene 4/0 suture in simple congenital ptosis.

MATERIAL & METHODS

This was a hospital based comparative study conducted at Department of Ophthalmology, Khyber Teaching Hospital, Peshawar. The duration of the study was three months from June to August 2018. Permission to conduct this study was obtained from the Institutional Research and Ethical Review Board, Khyber Medical College under Registration no. 227/ADR/KMC.

Patients with poor levator function (≤5mm), moderate to severe ptosis and good Bell's phenomenon of either gender having age range of 5-25 years were included in the study. Patients having history of eye surgery, history of squint, Marcus Gunn jaw winking and variable ptosis were excluded. Patients fulfilling the inclusion criteria were included in the study.

Informed consent was obtained from the patients after explaining the benefits and risks regarding the study. Randomization was conducted through sequentially number opaque envelopes generated from a random numbers table. 35 patients were recruited in prolene 4/0 suture group (Group A) and 35 patients were selected for silicone rod group (Group B).

In both groups general anesthesia was used. Three horizontal marks 2mm long were made in the upper lid. First was 2 mm above the lash line, second above the pupil and third above each of the junctional thirds of the lid margins. Incisions in the medial and lateral marks were made through the skin and pretarsal muscle to the tarsus with a No. 11 blade. Three stab incisions were made in the brow to the periosteum. First incision was made 0.5 cm above the orbital rim and vertically in line with the lateral canthus. The second incision was made 0.5 cm above the orbital rim and vertically in line with the medial canthus. The third incision was made 1 cm above the other 2 stab incisions in the forehead vertically in line with the central lid mark previously made. Passing the sling material through these incisions resulted in the formation of typical Fox pentagon sling design. Pressure over the 3 stab incisions provided hemostasis. A 4-0 silk traction suture was placed in the tarsus, by passing the needle in and out of the gray line in the centre of the lid. Lid plate was placed under the lid and traction suture pulled to put the lid on constant stretch.

In Group A, 4-0 prolene was used as sling material and 20-gauge hollow needle was used to guide 4-0 prolene for the formation of typical

Fox pentagon. In Group B, Silicone rod (1mm in diameter, used in dacryocystorhinostomy) was used as sling material and Wright needle was used to guide the silicone rod for the formation of typical Fox pentagon.

The two ends of the 4-0 prolene in Group A and Silicone rod in group B were pulled to raise the upper lid to the level of superior limbus and were then tied and buried in the forehead stab incision. The three stab incisions of the fore head were then closed with 5-0 prolene.

At the end of the procedure, a bandage contact lens and a Frost suture of 4-0 black silk was placed, allowing closure of the eye(s) by fastening the lower lid to the forehead with adhesive strips.

All patients were called for follow up after one week, one month and three months. Good functional outcome was assessed after three months postoperatively as per operational definition by researcher himself on a designed proforma. Good functional outcome was considered as achieved when the marginal reflex distance is more than or equal to 1 mm, and was considered as not achieved when the marginal reflex distance is less than 1 mm on physical examination after 3 months of the procedure.

Data was analyzed using SPSS 20, frequencies and percentages were computed for categorical variables while Mean and SD were calculated for numerical variables. Chi Square test was used for stratification of good functional outcome with respect to age groups which were 5-15 and 16-25 years.

RESULTS

A total number of 70 patients were selected for the study, 35 patients in Group A and 35 patients in Group B. As per descriptive statistics, in Group A, mean and SD for age was recorded as 12+6.31. Mean and SD for duration of procedure was recorded as 52+3.08 minutes. In Group B, mean and SDs for age was 15+4.76, while mean and SDs for duration of procedure was 55+1.82 minutes.

The age wise distribution of patients in Group A and B is demonstrated in Table-I, while Gender distribution of patients of both groups is described in Table-II.

The achievement of good functional outcome in Group A and B is shown in Table-III, however, Table-IV explains the stratification of good functional outcome with respect to age showing that good functional outcome is statistically significant in the age group of 16-25 years.

Age Group	Group A (n=35)	Group B (n=35)	Total (n=70)
5-15 Years	20 (57.14%)	20 (57.14%)	40 (57.14%)
16-25 Years	15 (42.85%)	15 (42.85%)	30 (42.85%)
Total	35 (100%)	35 (100%)	70 (100%)

Table-I. Age distribution of patients in both groups

Gender	Group A (n=35)	Group B (n=35)	Total (n=70)
Male	21 (60%)	25 (71.42%)	46 (65.71%)
Female	14 (40%)	10 (28.57%)	24 (34.28%
Total	35 (100%)	35 (100%)	70 (100%)

Table-II. Gender distribution of patients in both groups

Good Functional Outcomes	Group A (n=35)	Group B (n=35)	Total (n=70)
Achieved	31 (88.57%)	22 (62.85%)	53 (75.71%)
Not Achieved	04 (11.42%)	13 (37.14%)	17 (48.57%)
Total	35 (100%)	35 (100%)	70 (100%)

Table-III. Achievement of good functional outcome in both groups

Age	Good Functional Outcome	Group A (n=35)	Group B (n=35)	P-Value
5-15 Years	Yes	18 (51.42%)	14 (40%)	0.113
	No	02 (5.71%)	06 (17.14%)	
16-25 Years	Yes	13 (37.14%)	08 (22.85%)	0.046
	No	02 (5.71%)	07 (20%)	

Table-IV. Stratification of good functional outcome with age in both groups

DISCUSSION

This study compared the frequency of good functional outcome of frontalis suspension surgery using silicone rod versus prolene 4/0 suture in simple congenital ptosis and evaluated better functional outcomes with prolene 4/0 suture in comparison to frontalis suspension using silicon rod in cases of simple congenital ptosis.

In our study the mean age of group A was 12+6.31 with 60% males and 40% females. Out of 35 patients in group A 88.57% patients achieved good functional outcome in frontalis suspension procedure by using suture of prolene 4/0 in simple congenital ptosis. Similar findings were noted in a study conducted in Bangladesh[19] which showed a mean age of 25.16+9.16, males were 44% and females were 56% and the good functional outcome was 80% in frontalis suspension procedure by using suture of prolene 4/0 in simple congenital ptosis. In a study conducted by Chow K et al[2], the frequency of functional success in pediatric group in frontalis suspension procedure by using prolene 4-0 suture was 74%. In another study conducted in Pakistan by Rai P et al[20] showed satisfactory functional and cosmetic results in 84.6% patients.

In group B of the present study, of 35 patients 22 (62.85%) achieved good functional outcome in frontalis suspension procedure using silicon rod. In a study conducted by Abueleinen KG[21] it was found that silicone lacrimal tubes achieved 80% success in ptosis repair. In a Pakistani[17] study it was found that the success frequency of silicone tube in frontalis suspension procedure was 91.4%. In a study conducted in Riyadh, Saudi Arabia[22], open and closed methods of the frontalis sling suspension using a silicone rod was evaluated, 50% successful outcome was seen in the open group and 51.8% in closed group.

In our study we found statistical significance (p=0.046) between good functional outcome and age group of 16 to 25 in both groups. However, the age group of 5 to 15 did not show statistical significance (p=0.113). In group A the mean duration of procedure was 52+3.08 as compared to group B which 55+1.82. Fixing of ptosis needs in time and continuous assessment. For the implementation of functional and aesthetic correction, advance skills and experienced health care professionals are required as well. Consequence of global investigations cannot be summed up and linked with our population due to puzzling factors and genetic diversities.

CONCLUSION

In simple congenital ptosis, prolene 4/0 suture achieved good functional outcome and an excellent safety profile in comparison to frontalis suspension using silicon rod.

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AUTHORSHIP AND CONTRIBUTION DECLARATION

No.	Author(s) Full Name	Contribution to the paper	Author(s) Signature
1	Maqbool-ur-Rehman	Basic conception, designing, lab works, data collection, and write-up.	
2	Ubaidullah	Basic conception, designing, lab works, data collection, and write-up.	
3	Aeeza Malik	Basic conception, designing, lab works, data collection, and write-up.	
4	Bakht Samar Khan	Data entry, data analysis, literature search, write up, give final approval.	
5	Ahmad Jamal	Data entry, data analysis, literature search, write up, give final approval.	
6	Jawad Humayun	Data entry, data analysis, literature search, write up, give final approval.	
7	Mushtaq Khalil	Data analysis, results interpretations, critically reviewed the manuscript, gave final approval.	
8	Ansa Benazir	Data analysis, results interpretations, critically reviewed the manuscript, gave final approval.