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Original Article

Blepharoptosis: Pattern and its Surgical Management in a Tertiary Eye Hospital of Eastern Nepal

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ABSTRACT

Introduction: Blepharoptosis or drooping of the eyelid is a common disease entity presenting in oculoplasty department. Depending on its severity it causes visual disturbances as well as cosmetic problems. Appropriate management and timely surgical intervention results in a good outcome.

Materials and methods: This is a hospital-based study of a blepharoptosis patient that presented in the Oculoplasty department and underwent ptosis correction by various methods from July 2016-December 2019.

Results: A total of 85 cases with 104 eyes underwent ptosis surgery. The mean age was 24.5 years. Among them, 31.8% were pediatric and 68.2% were adults. Astigmatism was seen in 21.1% followed by myopia in 10.6% and hypermetropia in 4.7%. Amblyopia was seen in 13% of cases. Common surgical procedures performed were frontalis sling suspension 64.7%, followed by levator advancement 33%, and frontalis sling surgery with V-Y plasty 2.3%.

Conclusions: Ptosis is seen to be associated with refractive errors, strabismus, or amblyopia. Proper clinical evaluation of the patient is essential to know the etiology, type, and severity of ptosis. Timely surgical intervention is necessary to prevent morbidity and enhance its outcome.

Keywords: Amblyopia; Blepharoptosis; Frontalis sling surgery; Levator advancement; Ptosis

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INTRODUCTION

Blepharoptosis or ptosis refers to the pathologic condition in which the upper eyelid margin is inferiorly displaced when the eye is in the primary position.[1] It is one of the common disease entities we see in the oculoplasty department. The upper eyelid, at times, is covered up to the pupillary aperture to a degree that is enough to cause visual impairment (from the obstruction created). Such cases require surgery not only for visual axis correction but also for cosmetic enhancement. Ptosis can be either congenital or acquired. There is no racial or gender predilection in either type of ptosis and is equally occurring among the different races and between males and females.[2]

According to various studies, the prevalence of ptosis in children is 1% and in adults, it is 10%.[3,4] Ptosis can be classified according to its severity (levator function), anatomy, and age of onset (congenital and acquired).[5,6] According to etiologic factors, it can be neurogenic, myogenic, aponeurotic, or mechanical.[7] In congenital ptosis about 20–70% of patients may

have amblyopia[8,9]and is mainly seen in a patient with unilateral congenital ptosis. Congenital ptosis may be a part of congenital syndromes like blepharophimosis syndrome, Marcus Gunn's jaw winking syndrome, and certain forms of congenital fibrosis of the extraocular muscles syndromes (CFEOM), and congenital horner syndrome. Aponeurotic ptosis is mainly seen in natural age-related changes, or after any ocular surgery, eye rubbing, chronic inflammation, long-term contact lens wear, or trauma.[10,11] Hence, a thorough ocular examination is essential for better post-operative management and prognosis.

Ptosis can be classified as minimal = 1-2 mm, moderate = 3-4 mm, or severe >4 mm based on the amount or severity of ptosis.[12] This gives us a good clinical examination result for correction when this is used in conjunction with the amount of levator excursion (excellent – 13 to 15 mm, good - 8 to 10 mm, fair- 5 to 7 mm, poor - 4 mm or less).[8] According to the severity of the ptosis and levator palpebrae superioris function, there are various methods of surgical corrections. The most common procedures we performed at our center are frontalis sling suspension and levator palpebrae superioris advancement. There are various types of materials available to create the sling between the frontalis muscle and the eyelid tarsus in severe types of congenital ptosis. The most commonly used sling materials are autogenous fascia lata or silicon slings. In cases with good levator function especially in aponeurotic ptosis levator advancement surgery will yield great results.

Studies from Nepal have shown the etiologies of various types of ptosis and their mode of surgical correction. This study was done to identify various etiologies of ptosis and associated refractive errors with it in patients undergoing different modes of surgical correction for ptosis in our hospital.

MATERIALS AND METHODS

Data of all the cases of ptosis that presented in the Oculoplasty department and underwent ptosis correction by various methods from July 2016- December 2019 were included in the study. Patients who refused surgical correction of ptosis were excluded. Patient's demographic data, laterality, the onset of ptosis (congenital and acquired) and mechanism of ptosis (aponeurotic, myogenic, neurogenic, or mechanical due to mass effect), the severity of ptosis, duration of symptoms, associated ocular pathology, history of previous lid surgery, method of ptosis correction i.e. frontalis sling or levator palpebrae superioris (LPS) muscle advancement were noted. The presence of refractive error and amblyopia preoperatively were also noted.

In unilateral ptosis, mild ptosis was defined as the difference of ≤2 mm, moderate ptosis as the difference of>2–4 mm, and severe ptosis as the difference of>4 mm or more in comparison with the other eye. In bilateral cases the ptosis was classified as severe if the height of the palpebral apertures was less than or equal to 4 mm, moderate if the palpebral apertures were between 4–6 mm, and mild if the palpebral aperture was 6 mm or more. Levator function was defined as the excursion of the upper eyelid from extreme down gaze to extreme up gaze. Its function was classified as excellent (13 to 15 mm), good (8 to 12 mm), fair (5 to 7 mm), and poor (4 or less). Indications for surgery (e.g. occlusion of the visual axis, amblyopia, abnormal head posture, and cosmetic reasons) and type of surgery (levator advancement or frontalis suspension) were noted. Materials used in frontalis sling surgeries were silicon rods in all cases. In aponeurotic cases, LPS advancement was done with a 5-0 Polyester suture. Pre- and postoperative photographs of patients were taken with proper patient consent.

Ethical approval for the study was taken from the institutional review committee of Biratnagar Eye Hospital. The data were entered into an excel sheet and statistical analysis was done with SPSS 17.

RESULTS

A total of 85 cases with 104 eyes who underwent ptosis surgery in our hospital were included in this study. Among them 27 patients (31.8%) were pediatric cases (age <16 years) and 58 (68.2%) were adults. The mean age of the study population was 24.5 years with ages ranging from 3 to 88 years. In the pediatric age group, male patients (n=15) were more than females (n=12). Whereas in the adult age group, females were more than males. In terms of laterality, out of a total of 85 cases, 19 cases (22.3%) had bilateral involvement while 66 (77.7%) had unilateral ptosis. In the unilateral cases, the right eye was involved in 27 cases (31.8%) while the left eye was involved in 39 cases (45.9%). Among the pediatric age group, 22% underwent bilateral ptosis correction and 78% underwent unilateral ptosis correction (52% in the left eye and 26% in the right eye). According to the mechanism of ptosis, the majority were simple congenital ptosis (52.9%) followed by acquired aponeurotic ptosis (28.2%).

Various types of ptosis according to the mechanism were shown in Table 1.

Table 1: Types of ptosis according to the mechanism among the study population

Mechanism of ptosis		Number of cases (n)	Total
Acquired	Degenerative	17	24/85
	Recurrent eyelid edema	1	
	Rubbing eyes	2	
	Traumatic	4	
Myogenic	Simple congenital	45	61/85
	Blepharophimosis syndrome	5	
	Marcus Gunn Jaw winking phenomenon	3	
	Muscular dystrophy	1	
	Neurofibromatosis	3	
	Strabismus	4	

In this study, emmetropia was seen in 50.6% of cases (n=43) and the rest had some form of refractive errors. Astigmatism was the most common type of refractive error seen (21.1%) followed by myopia (10.6%) and hypermetropia (4.7%) respectively. Amblyopia was seen in 13% (n=11) of cases that underwent ptosis surgery (Table 2).

Regarding the severity of ptosis, 16.47% had mild, 30.6% had moderate and 52.9% had severe ptosis. Severe ptosis was the most common type seen in both pediatric and adult cases. A comparison of the severity of ptosis with the presence of refractive error and

amblyopia, using the Pearson chi-square test shows a statistically insignificant result (p-value= 0.66 and 0.7 respectively).

Table 2: Types of refractive errors in different types of ptosis

Refractive errors	Congenital	Acquired	Frequency (%)
Emmetropia	32	11	43 (50.6%)
Amblyopia	10	1	11 (13%)
Astigmatism	12	6	18 (21.1%)
Myopia	3	6	9 (10.6%)
Hypermetropia	4	0	4 (4.7%)
Total	61	24	

Indications for surgery were cosmetic in 74.1% (n=63) and amblyopia in 25.9% (n=22). Most of the cases that underwent ptosis surgery were congenital ptosis (71.8%) while the rest was acquired ptosis (28.2%).

Choice of surgery depended upon the levator palpebrae superioris function. If the levator function is 7mm or more, LPS advancement surgery was performed and if the levator function was lesser than that, frontalis sling suspension was performed.

The material used for frontalis sling suspension was a silicon rod in all cases. Frontalis sling suspension was performed in majority 64.7% (n = 55) followed by levator advancement 33% (n = 28) and frontalis sling surgery with V-Y plasty in 2.3% (n = 2). (Table: 3) Frontalis sling surgery with V-Y plasty was performed in 2 out of 5 cases of Blepharophimosis syndrome. Out of a total of 85 cases, 75 (88.23%) cases were performed under local anesthesia and the rest 10 (11.77%) was performed under general anesthesia.

Table 3: Types of ptosis correction surgery performed in different types of ptosis

Types of ptosis surgery	Congenital ptosis	Acquired ptosis
Frontalis sling with silicon rod	49/55	6/55
Frontalis sling with silicon rod with v-y plasty	2/2	0/2
Levator advancement	10/28	18/28

DISCUSSION

Ptosis correction is one of the common surgeries done at this eye hospital. According to the types of ptosis and levator function, the mode of surgery is decided. In comparing our study with others in terms of age group, pediatric patients were 31.2% and adults were 68.2%. The mean age of our study population was 24.5 years. This finding is similar to the study done in south India by Nagaraju G et.al where the mean age group undergoing ptosis surgery was 21.6 years.[13] Our study is also similar to the study done by Gautam P et al.where the mean age of presentation of ptosis was 27 years.[14] This study which has 77.7 % of unilateral ptosis is also comparable with various other studies which show 60-70% prevalence of unilateral ptosis.[15,16] Even in the ptosis prevalence study done in western Nepal, they showed unilateral ptosis being 87.7% regardless of onset of ptosis. This finding is in contrast with the study done in Singapore where 54.3% had bilateral and 45.7% had unilateral ptosis surgery.[17]

In our study population, 71.7% had congenital ptosis and 28.3% had acquired ptosis. This finding is in contrast to the study done in Singapore where the rate of congenital ptosis is much lesser in comparison to aponeurotic ptosis (21.9% and 78.2%) respectively. [17] Even in the study done in western Nepal the prevalence of congenital ptosis and acquired ptosis had not much difference (52% and 48%).[14]

In studying the refractive errors among our cases, refractive error was seen in 49.4% of cases. Congenital ptosis had maximum refractive errors (47.5%), among which astigmatism is the most common finding (19.6%) followed by amblyopia (16.3%). This finding is comparable with the study done by Thapa et al[18] where they found 16.7% of significant refractive error in congenital ptosis and 19.2% amblyopia. In the study by Gautam P et al. amblyopia among the ptosis, cases were much lesser (4.7%) than in our study.[14] We had 4 cases (6.5%) of strabismus and all of them were present in congenital ptosis. All these cases underwent strabismus correction prior to ptosis correction. When we compare the study with Thapa et al., the strabismus is much higher in their study (26.9%).

In comparison with our study where we had more severe ptosis (45%) followed by moderate and mild ptosis (26% and 14%), other studies done in Nepal show the same results where mild ptosis is more frequently presented (61%) in the hospital.[14] The indication of ptosis correction was mainly cosmetic in our study (74.1%). This is very common as ptosis is non-progressive and if it is non-amblyogenic, presentation is late with cosmetic awareness. This finding is comparable with the study done by Gautam. P et al.[14] and similar findings can be seen in a study by V Lee et al. where 57% of patients had cosmetic and 43% had visual indications for ptosis surgery.[19]

In this study, we had more frontalis sling surgery (64.7%) followed by LPS advancement (33%). This finding is in contrast with the study done in Singapore where only 8.9% had brow suspension and the rest had levator surgery. This may be because they have more acquired ptosis with good levator function in comparison to our study. There are various materials used for frontalis sling surgery in different hospitals. We prefer silicone sling for its easy availability, cost-effectiveness, biocompatibility, and no surgical intervention in any other part of the body as in harvesting fascia lata.

Although blepharoptosis is one of the common surgeries we perform in our department, data records of all clinically diagnosed ptosis cases could not be retrieved. So this study is limited to those who underwent a surgical procedure. Hence it does not show the true picture of the prevalence of ptosis and its causative factors in this hospital. As there is a poor follow-up after surgery we could not comment on the outcome and effectiveness of our surgery in this study.

CONCLUSIONS

Blepharoptosis is a common problem seen in both children as well as adults and may be congenital or acquired. Ptosis is seen to be associated with refractive errors, strabismus, or amblyopia. Proper clinical evaluation of the patient is essential to know the etiology, type, and severity of ptosis. Knowing about different modalities of surgical correction and its outcome will enhance the services in the future.

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