Clinical characteristics and surgical outcome of eyelid ptosis at tertiary eye hospital: a retrospective study

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Background: Ptosis is a common upper eyelid problem which can be seen in children and adult. Ptosis can cause amblyopia in younger patients and reduce visual field in older patients.
Objectives: To determine the prevalence and clinical characteristic of ptosis and to evaluate surgical outcome of eyelid ptosis.
Methods: In this descriptive-retrospective study, 490 medical records of patients who admitted to Jakarta Eye Center Hospital between 2014 and 2016 with diagnosis of eyelid ptosis were included in this study. Prevalence rates, patient's demographic, clinical characteristic, type of therapy, successful rate and complication of ptosis surgery were evaluated.
Results: The prevalence of ptosis in this study was 490 patients and was more frequent in men aged 44.5 years old. The ptosis was predominantly unilateral 79.6%. Ptosis was mild in 33.5% cases and myogenic ptosis was the most common etiology of ptosis in this study. Levator resection is the most prevalent type of surgery. The success rate of ptosis surgery was 91.8%.
Conclusion: The success rate of ptosis surgery in this study was high and undercorrection was the most common complication of ptosis surgery.
Conflict of Interest: There is no conflicting relationship exists for any author.
Keywords: eyelid ptosis, levator resection, successful rate, ptosis surgery.
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Introduction

Ptosis or blepharoptosis is a dropping of the upper eyelid that can occur unilaterally or bilaterally.[1] Ptosis is one of the most common upper eyelid abnormalities in oculoplastic practice that affects visual field and could reduce visual acuity. Ptosis can be present as mild to severe condition.[2] Ptosis can be classified as congenital and acquired and has variety of etiology such as myogenic, neurogenic, traumatic, mechanic, neuromuscular, neurotoxic, involutional or aponeurotic, and pseudoptosis.[2] Study by Baiyeroju et al[3] stated there were 25 cases of ptosis during 5-year period, 52% of the patients were found to be less than 16 years of age while 8% were over 50 years of age.[3] The sex ratio of ptosis between men and women was quite similar 1:1 and 68% cases was unilateral.[4]

Comprehensive eye examinations consist of history taking, physical and ophthalmological examination are important to make the diagnosis and to determine the treatment. It is also important to perform the specific

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eyelid measurements such as margin reflex distance (MRD), margin limbal distance (MLD), vertical palpebral fissure (VPF), levator action (LA), bell's phenomenon, lid lag, and skin crease in ptosis cases. Photograph before and after therapy should also be taken in order to assess the improvement after therapy.[4]

Management of ptosis depends on the underlying etiology. Not all ptosis cases should be performed surgery. Surgical management could be performed in congenital, involutional, or mechanical ptosis which obstructs the visual field and visual acuity. The purpose of this study is to determine the prevalence rate, demographic and clinical characteristic of ptosis patients, type of therapy, and the success rate of ptosis surgery in Jakarta Eye Center Hospital, Indonesia.

Methods

This is a descriptive-retrospective study. Medical records of 490 patients who first diagnosed with eyelid ptosis between January 1st 2014 and December 31st 2016 in Jakarta Eye Center Hospital were ana lysed. The success rate of ptosis surgery was assessed based on the presence of ptosis after surgery, the equal point or at least 1 mm difference of Margin Reflex Distance (MRD) and Vertical palpebral fissure (VPF) before and after surgery for unilateral ptosis and the equal point of MRD and VPF after surgery with MRD and VPF in normal patient for bilateral ptosis and the presence and absence of complication of surgery. The choice of surgical type procedure for ptosis repair in this study depends on the degree of levator function. If the levator function is poor (LA<4 mm), frontalis suspension with fascia lata approach will be performed. If the levator function is moderate until good (LA 4-12 mm), levator resection approach will be performed. If the levator function is excellence (LA>12 mm), levator advancement approach will be performed. Data analysis was performed on all variables.

Results

In this study, the number of ptosis patients was quite similar between male (54%) and female (46%) with ratio ± 1.2:1. From the demographic data as shown in table 1, unilateral ptosis is more predominant compared with bilateral. The median age of ptosis is 44.5 years old with the minimum age 2 weeks and maximum age 94 years old.

Table 1: Demographic characteristic of ptosis patient in JEC hospital in 2014 – 2016

Demographic	Number of patients (n=490)	Percentage (%)
Gender		
Male	266	54.3
Female	224	45.7
Laterality		
Unilateral	390	79.6
Bilateral	100	20.4
Age (years)		Median (min –max)
		44.5 (1-94)
1-19	206	42
20-39	89	18.2
40-59	117	23.9
≥ 60	78	15.9

Figure 1: shows a significant increase in the number of ptosis patient in 2015 by 40%. While in the year 2016 there were also an increase for only 7%.

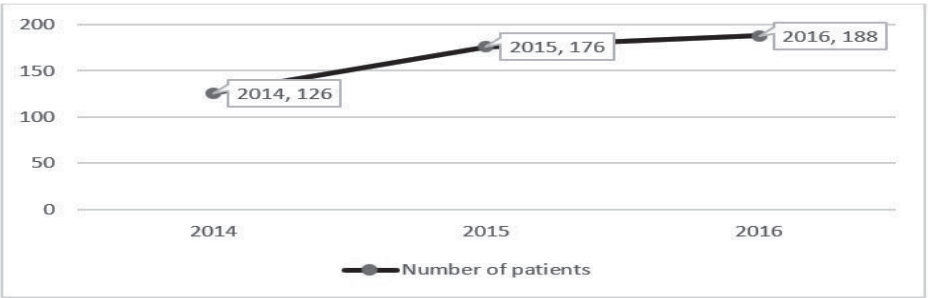

Table 2 shows that most of the patients had acquired ptosis (73.7%) while the others had congenital ptosis (26.3%). Mild ptosis was more often in this study compared to moderate and severe ptosis. The most common etiology of ptosis was myogenic (33.1%) and involutional ptosis (24.7%).

Table 2: Clinical characteristic of ptosis patients in JEC hospital in 2014-2016

Clinical characteristic	Number of patients (n=490)	Percentage (%)
Type of ptosis		
Congenital	129	26.3
Acquired	361	73.7
Degree of ptosis		
Mild	164	33.5
Moderate	135	27.6
Severe	113	23.1
N/A	78	15.9
Etiology of ptosis		
Myogenic	162	33.1
Involutional	121	24.7
Neurogenic	111	22.7
Traumatic	78	15.9
Mechanic	3	0.6
Pseudoptosis	15	3.1

Most of the patients had been planned to have surgery (46%), while 27.7% was observed and others were still required further examination such as orbital CT-Scan, head MRI or EMG and in need of consultation to another department and division to figure out the etiology of ptosis as shown in table 3.

In surgical management, which is shown in figure 2, 160 patients were planned to perform levator resection surgery, 55 patients frontalis suspension with fascia lata graft surgery, and

1 patient levator advancement surgery; only 122 patients were performed ptosis surgery as shown in table 4. We included preoperative and postoperative condition of 2 patients in Figure 3. The success rate of ptosis surgery was 91.8% and only 8.2% required second ptosis surgery. The surgeries were done by 3 surgeons who are equally competent in this field and the surgery outcomes were not significantly different. The most frequent complication of surgery in this study was undercorrection (4.9%) as shown in table 5.

Table 3: Type of ptosis therapy at JEC eye hospital in 2014-2016 (n = 490)

Management	Number of patients (n=490)	Percentage (%)
Surgery	225	46
Observation	136	27.7
Medicine	45	9.2
Ancillary test	37	7.5
Further consultation	47	9.6

Figure 2: Surgical management plan of ptosis patient at JEC eye hospital in 2014-2016 (n = 225)

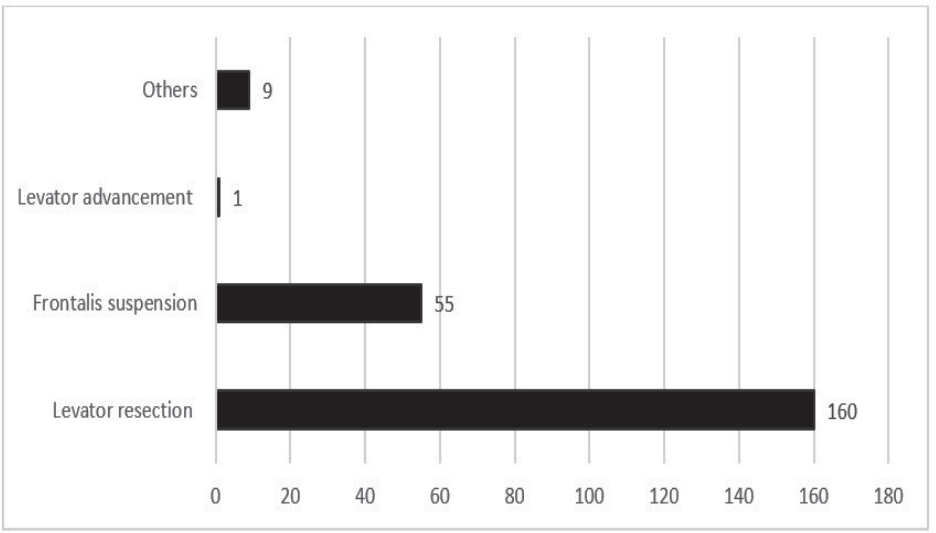

Table 4: Evaluation of ptosis surgery at JEC eye hospital in 2014-2016 (n=122)

Surgery Result	Number of patients (n=122)	Rate (%)
Success	112	91.8
Failure	10	8.2

Figure 3: a. Ptosis with good levator action preoperative condition; b. Post levator resection surgery; c. Ptosis with poor levator action preoperative condition; d. Post frontalis suspension surgery

Table 5: Complication after ptosis surgery at JEC eye hospital in 2014-2016 (n=10)

Complications	Number of patients (n=10)	Percentage (%)
Undercorrection	6	4.9 %
Overcorrection	2	1.6 %
Palpebral cicatrix	1	0.8 %
Excessive skin	1	0.8 %

Discussion

Ptosis is one of the most common abnormalities of the upper eyelid. In this current study, the prevalence of ptosis at JEC eye hospital between 2014 and 2016 was 490 cases. In 2014 there were 126 cases of ptosis and there was a significant increase in 2015 by 40% to 176 cases of ptosis and slightly increase by 7% to 176 cases in 2016. In contrast to our study, Balasubrahanian K et al[5] showed the incidence of ptosis in tertiary hospital in Thanjavur India was only 109 cases.

In this study 54.3% were male and 45.7% were female with male to female ration of 1.2:1 as shown in table 1 which is comparable with the observation of Balasubrahanian K et al[5] of 61.5% males and 38.5% females. Skaat et al[6] also showed a male predominance in the study of 56.7%. Some literature stated that gender is not an associated factor for ptosis. The weakness

or dysgenesis of levator muscle, the presence of history of eye surgery or upper eyelid trauma, the weakness of the 3rd nerve, the presence of upper eyelid tumor are the main predisposing factors for ptosis.[1]

In our study, unilateral ptosis was more predominant by 79.6% compared to bilateral ptosis by 20.4%. Abrishami et al[7] reported the similar result in their series at tertiary hospital in Iran by 90.5% of unilateral ptosis. The median age of patients in our studied population was 44.5 years with the age range from 1-94 years which is consistent with study of Hashemi et al[8] who observed the age range to be from 1-96 years in Tehran population. In our study, most of the ptosis patients were at age range 1-19 years by 42%. Hashemi et al[8] stated the similar result of the ptosis patient came at age range 1-19 years by 37.5%.

In our series, acquired ptosis was the most common type of ptosis (74%) compared to congenital ptosis (24%). Clinically, most of the ptosis patient who came to our hospital had mild ptosis. In contrast with Balasubrahanian et al[5] in their series showed the majority of patients who came in Thanjavur India were moderate ptosis by 61.54%. In this current study the most common etiology of ptosis were myogenic (33.1%), followed by involutional/aponeurotic (24.7%), neurogenic (22.7%), traumatic (15.9%), pseudoptosis (3.1%) and mechanical (0.6%). In contrast with retrospective study by Gonzalez et al[9] showed the most common etiology were involutional (52.9%), followed by congenital (27.1%), mechanic (8.9%), myogenic (3%), neurogenic (4.6%), and traumatic (3.3%).

Not all ptosis cases are performed surgery. Surgical management can be performed in congenital, involutional/aponeurotic and mechanical ptosis. In our study, 46% patients were planned to have surgery, 27.7% was observed, 9.2% got some medicine, 7.9% still needed further examination such as orbital CT-Scan, head MRI, and EMG, the last 9.6% still needed consultation to another department/division. Of 46% patient who planned to have a surgery, only half underwent the surgery. Types of surgical management at JEC eye hospital between 2014 and 2016 were 160 cases levator resection, 55 cases frontalis suspension with fascia lata, 1 case levator advancement and others were performed tumor excision and reconstruction of fracture. The result of ptosis surgery in this series was determined by the presence of ptosis after surgery, comparison MRD and FPV before and after surgery and the presence of complications after surgery. The successful criteria are the absence of ptosis after surgery, an equal or at least 1 mm difference of MRD and FPV before and after surgery, and the absence of complication after surgery.

In this current study of 122 patients who had been performed surgery, the success rate of ptosis surgery was 91.8% and only 8.2% was failed and needed a second surgery. Our study has a higher result compared to the study by Abrishami et al[7] and Jordan et al[10] which showed the success rate of levator resection surgery was 78.7% and 43%, respectively.

In our study, the most common complication was undercorrection by 4.9% which are similar to the study of Abrishami et al[7] and Tyers et al[11] in their studies that stated undercorrection was the most common complication (19.1% and 19%). Levator resection was the type of surgery that caused all cases of undercorrection in this study. The surgeon did resurgery to make sure that the complication was well-managed. Other potential complications in ptosis surgery include overcorrection, unsatisfactory or asymmetric eyelid contour, scarring, wound dehiscence, eyelid crease asymmetry, conjunctival prolapse, and lagophthalmos with exposure keratitis.[5]

In this study, other complications were overcorrection (1.6%), palpebral cicatrix (0.8%) and excessive skin (0.8%).

Our study was retrospective which took secondary data from medical record, hence some data that we required were incomplete. Therefore, we need further prospective study.

Conclusion

The prevalence of ptosis at Jakarta Eye Center eye hospital between 2014 and 2016 was 490 patients. Ptosis was higher in men in the age of 44.5 years old and was predominantly unilateral. The success rate of ptosis surgery was high and the most common complication was undercorrection.

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