

CLINICAL CHARACTERISTICS AND SUCCESS OF PTOSIS SURGERY AT INDONESIA NATIONAL EYE CENTER CICENDO EYE HOSPITAL DURING JANUARY 2016 - DECEMBER 2020**Rahayu Widhyasti^{1*}, Shanti Fitrianti Boesoerie²**¹Faculty of Medicine, Padjadjaran University²Indonesia National Eye Centre, Cicendo Eye Hospital

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Doi: <https://doi.org/10.33024/mahesa.v4i3.14062>**ABSTRACT**

Ptosis is defined as drooping of the upper eyelid. Unilateral or bilateral ptosis can affect appearance and visual function, both of which can negatively impact quality of life. It may be congenital or acquired, determined by the timing of onset. To describe clinical characteristics and surgical outcome in ptosis correction surgery at Indonesia National Eye Centre, Cicendo Eye Hospital. This is a descriptive-retrospective study, medical records of patients who was admitted to Indonesia National Eye Centre, Cicendo Eye Hospital, from January 2016 to December 2020 with diagnosis of eyelid ptosis were included in this study. From total of 189 patients (209 eyes) in this study, there were 41,8% male and 58,2% female patients with median age 22 years at the first time of visit. Most of the patients had unilateral ptosis (89,5%), and 10,5% had bilateral ptosis. According to the etiology of ptosis, 34,2% eyes were neurogenic ptosis. Degree of ptosis were severe in 70,9% eyes and most patients had fair levator function. Success rate were more than 95% in ptosis patient who underwent surgery. Majority of ptosis patient in Indonesia National Eye Centre, Cicendo Eye Hospital were caused by neurogenic followed by mechanical, traumatic, aponeurotic, myogenic, and pseudoptosis. Female patients were more common than male patients and median age at the first time visit were during second decade of life. Surgical outcome in ptosis tend to have high clinical success rates.

Keywords: Characteristic, Outcome, Ptosis, Surgery**INTRODUCTION**

Ptosis is one of the most common upper lid abnormalities in reconstructive, oncological, and oculoplasty practice. This condition affects visual acuity and field of view. Ptosis can be congenital or acquired. Based on the etiology, ptosis is divided into myogenic, aponeurotic, neurogenic, mechanical, traumatic, and pseudoptosis. (Korn, B. S., Burkat, C. N., Carter, K. D., Perry, J. D.,

Setabutr, P., Steele, E. A., Vagefi, M. R., Plastic, O., & Surgery, O., 2022)[1] ; Baiyeroju, A. M & Oluwatosin O M, 2003[2] ; Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016)[3].

Study conducted by Baiyeroju et al mentioned that 52% of ptosis patients were less than 16 years old and 8% were more than 16 years old (in 25 cases of ptosis that occurred

over 5 years). Based on gender, there are no significant difference between men and women. Laterality in the study was said to be 68% unilateral. In Indonesia, until now there has been no report on the incidence of ptosis. Baiyeroju, A. M & Oluwatosin O M, 2003[2] ; Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016)[3].

Holistic examination which includes history taking, physical examination and ophthalmology examination is important to establish the diagnosis and management. Ophthalmological examination in cases of ptosis includes margin reflex distance (MRD), margin limbal distance (MLD), vertical palpebral fissure (FPV), levator function (LF), bell's phenomenon, lid lag, and eyelid creases. Management of ptosis is given based on the etiology and ophthalmological examination. Currently there is no data on the clinical characteristics of ptosis cases at Indonesia National Eye Centre, Cicendo Eye Hospital.

LITERATURE REVIEW

"Ptosis," derived from the Greek word "fall," is the abnormal lowering or prolapse of a structure, it is known as blepharoptosis and is typically caused by dysfunction of the muscles that raise the eyelid (Levator palpebrae superioris (LPS) and Muller's muscle). Ptosis could be the first indication of a dangerous neurological condition. Ptosis is incapacitating when it blocks eyesight, regardless of the cause. The fundamental reason must be identified in order to implement proper management.

Although colleagues can commonly identify ptosis, in many circumstances a physician is the only

one who can. Ptosis can result from several distinct reasons or it can be a singular ailment. Onset of upper eyelid ptosis can be categorized as either acquired or congenital. It can be further classified as myogenic, aponeurotic, neurogenic, mechanical, or traumatic based on the cause.

The most acquired ptosis is aponeurotic, which is brought on by the levator aponeurosis extending or dislocating, while myogenic ptosis is most frequently caused by a poorly developed levator palpebrae superioris muscle. (Korn, B. S., Burkat, C. N., Carter, K. D., Perry, J. D., Setabutr, P., Steele, E. A., Vagefi, M. R., Plastic, O., & Surgery, O., 2022)[1] ; Tucker, S. M., & Cabral, H. (2000)[22] ; Siddens, J., Mitchell, S., Gladstone, G., & Gladstone, G. (2020)[23]

Researchers are interested in discovering more about the features of ptosis and surgical outcomes at Indonesia National Eye Centre, Cicendo Eye Hospital, as well as every center has distinctive characteristics and outcomes. Therefore, this study aims to examine the clinical characteristics and successful rate of ptosis surgery patients at Indonesia National Eye Centre, Cicendo Eye Hospital during period of January 2016 - December 2020.

RESEARCH METHODS

The research design in this study was a retrospective descriptive study conducted at tertiary hospital, Indonesia National Eye Centre, Cicendo Eye Hospital. Data were taken from medical records during period of January 2016 to December 2020 which were recorded with diagnosis of eyelid ptosis based on International Classification Code (ICD)-10 using total sampling method. The inclusion criteria in this

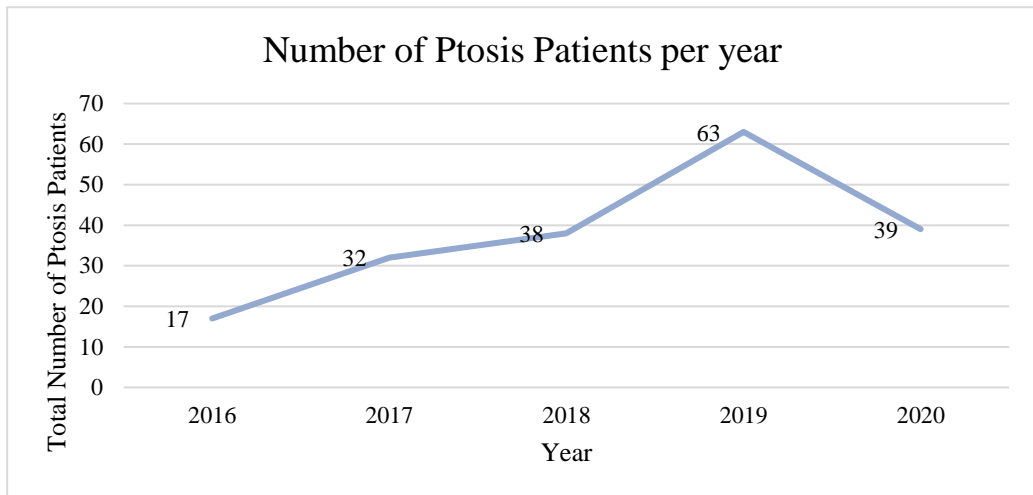


Chart 1. Total number of ptosis patients during 2016-2020
Source : Indonesia National Eye Centre, Cicendo Eye Hospital

Study were all patients at Indonesia National Eye Centre, Cicendo Eye Hospital from January 2016 to December 2020 with diagnosis of ptosis. Exclusion criteria are incomplete medical record data as well as ICD-10 code that does not match the medical record. Demographic data and clinical characteristics observed were gender, age at first presentation, lateralization of ptosis, etiology, degree of ptosis, surgical technique used, and success rate of surgery.

The causes of myogenic ptosis are caused by atrophy of the levator muscle that is invaded by adipose tissue, aponeurotic ptosis caused by weakening of levator aponeurosis often seen in old age, traumatic ptosis (injury to the levator muscle), neurogenic ptosis (paresis of cranial nerve 3), neuromuscular junction (myasthenia gravis), and mechanical (mass on lid). The degree of ptosis is determined by mild (1-2mm), moderate (3-4mm), and severe (>4mm). The function of the levator muscles in this study was divided into good if the levator muscle function was >12 mm, moderate if the levator muscle function was 4-12 mm, and bad if <4 mm.

Indicators of success were assessed from recurrence of ptosis after surgery, MRD 1, and FPV (if unilateral) both eyes were the same or had a difference of 1 mm on the right and left. For bilateral ptosis the size of MRD 1 and FPV after surgery is the same as normal size and the occurrence of postoperative complications. The postoperative complications assessed included: overcorrection, undercorrection, lagophthalmos, and asymmetrical. All data is processed using Microsoft Excel.

RESEARCH RESULT

The number of medical record data at Indonesia National Eye Centre, Cicendo Eye Hospital recorded 210 patients diagnosed as ptosis. A total of 21 patients were excluded from this study on the grounds that 7 patients had no status and 14 patients had a discrepancy between the ICD-10 code and the diagnosis recorded in the medical record, namely proptosis, bringing the total medical record data to 189 patients. The flow of data collection is shown in figure 1.

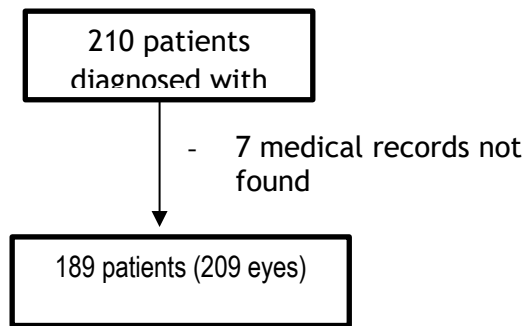


Figure 1. Sampling flow

The gender of ptosis patients were mostly female, with 110 patients (58.2%), compared to 79 male (41.8%) patients. The median age at the first visit was 22 years. The majority of patients in this study were in the age range of 0-19 years, namely 43.3%, followed by the 20-39 year age group amounting to 29.9%,

the 40-59 year age group amounting to 15.8%, and the age group over 60 years amounting to 13.7%. Unilateral ptosis laterality was more numerous, namely 169 patients (89.5%), compared to bilateral 20 patients (10.5%). Patient demographic data is listed in table 1.

Table 1. Patient demographic data

Variable	n (189 patients)	%
Gender		
Man	79	41,8
Woman	110	58,2
Age of first visit (years)		
1-19 years	82	43,3
20-39 years	51	29,9
40-59 years	30	15,8
≥60 years	26	13,7
Laterality		
Unilateral	169	89,5
Bilateral	20	10,5

Number of ptosis cases per year at Indonesia National Eye Centre, Cicendo Eye Hospital is shown in graph 1. There appears to be an increase in number of patient visits from 2016 to 2019. In 2020 there is 50% decrease in number of patient visits.

Table 2 shows the clinical characteristics of patients assessed based on the number of eyes due to consideration of the clinical differences of the patients in

bilateral ptosis. The majority type of ptosis was acquired ptosis in 111 eyes (53.2%) and the rest was congenital ptosis in 98 eyes (46.8%). The most common etiology in this study was neurogenic ptosis followed by mechanical, traumatic, aponeurotic, myogenic, and pseudoptosis. Judging from the degree of ptosis in this study, there were 148 eyes (70.9%) with severe ptosis. The majority of levator function in this study was of

moderate degree (4-12mm) in 139 eyes (66.6%).

Table 2. Clinical characteristics of the patients

Variable	n (209)	%
Ptosis type		
Congenital	98	46,8
Acquired	111	53,2
Acquired ptosis etiology		
Neurogenic	38	34,2
Mechanical	27	24,3
Traumatic	25	22,5
Aponeurotic	17	15,3
Myogenic	3	2,7
Pseudoptosis	1	1,0
Degree of ptosis		
Mild	12	5,7
Moderate	49	23,4
Severe	148	70,9
Levator function		
Good (>12mm)	12	5,7
Moderate (4-12mm)	139	66,6
Severe (<4mm)	53	25,3
Cannot be assessed	5	2,4

Table 3 describes the therapeutic data performed on ptosis patients divided into surgical and non-surgical with the result that majority of ptosis patients underwent surgical procedures for 139 eyes and majority underwent levator resections for 68 eyes (32.5%). Another surgical technique

used in these study were frontal suspension with synthetic or autograft in 16 eyes (7.7%) and 44 eyes (21%) respectively. The surgery was performed by three ophthalmologist (reconstruction, oncology, and oculoplasty subdivision).

Table 3. Management of ptosis

Management	n (209)	%
Surgical		
Levator resection	68	32,5
Frontal suspension (synthetic)	16	7,7
Frontal suspension (autograph)	44	21
Extirpated mass	9	4,3
Release scar	1	0,5
Levator advancement	1	0,5
Non surgical	70	33,5

The success rate of surgery is illustrated in table 4. Patients were divided into unilateral and bilateral ptosis. The success rate of procedure is assessed from MRD 1 and FPV. The results of this study showed an increase in MRD 1 and the width of the palpebral fissures. MRD 1 preoperatively for unilateral and bilateral ptosis had almost the same numbers, namely -0.12 ± 1.63 and -0.14 ± 1.78 respectively. MRD 1 postoperatively for unilateral and bilateral ptosis were 2.67 ± 1.37 and 2.54 ± 1.65 , respectively. FPV

preoperative results for unilateral and bilateral ptosis were 6.39 ± 2.2 and 6.62 ± 5.4 respectively, while postoperatively 8.37 ± 2.05 and 7.29 ± 1.87 for unilateral and bilateral ptosis.

Conditions of recurrence and reoperation are divided into unilateral and bilateral ptosis. Recurrence and reoperation occurred in 3 patients with unilateral ptosis (2.2%). Table 4 shows postoperative complications in 16 eyes with lagophthalmos (11.5%).

Table 4. Postoperative complications

Complications	n (%)
Undercorrection	1 (0,7%)
Overcorrection	1 (0,7%)
Lagophthalmos	16 (11,5%)
Asymmetric	0

DISCUSSION

Ptosis is the most common upper eyelid disorder in oculoplasty. Ptosis is assessed when upper eyelid position dropped more than 2 mm below the superior limbus. The number of patients with diagnosis of ptosis at Indonesia National Eye Centre, Cicendo Eye Hospital from January 2016 to December 2020 was 189 patients. Ptosis mostly occur in women compared to men. This is based on the fact that women are more aware of cosmetics and appearance. Study by Hashemi et al showed the same result as this study, namely that women experiencing ptosis were 1.2% more than men. Another study in Nigeria conducted at a tertiary hospital had a 1:1.25 comparison between men and women experiencing ptosis. Another study states that the prevalence of men having ptosis is more than women, namely 1.1: 1. Some of the above studies indicate that gender is not a risk factor that influences the

occurrence of ptosis. Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016[3], Omotoye, Olusola & Ajayi, Iyade & Ajite, Kayode & Adeleke, Funmilayo. 2018[4], Paik, J. S., Han, K., Yang, S. W., Park, Y., Na, K., Cho, W., Jung, S. K., & Kim, S. 2020[5].

The majority age group at the first visit in this study is aged 1-19 years, namely 82 patients (43.3%) with median age of 22 years. A retrospective study by Alamou S et al stated that the majority of ptosis occurred under age of 16 years. Research by Quaranta-Leoni FM et al states that patients aged 1-19 years still have a risk of developing amblyopia as they get older so that rate of visits to health facilities increases. (Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016[3], Paik, J. S., Han, K., Yang, S. W., Park, Y., Na, K.,

Cho, W., Jung, S. K., & Kim, S. 2020[5], Quaranta-Leoni, F. M., Sposato, S., Leonardi, A., Iacoviello, L., & Costanzo, S. 2017)[6].

The number of arrivals of ptosis patients shown in graph 1 has increased from 2016 to 2019, but in 2020 there has been a decrease of 50%. This condition is exacerbated by Enact Restrictions on Community Activities (PPKM) at the beginning of the 2020 pandemic. According to Yen CJ's research, number of polyclinic visits, especially in the field of ophthalmology, at the time of Coronavirus Disease 2019 (COVID-19) decreased by 46.9%. (Thakre, S., & Poptani, S. 2020.[11], Balasubrahanian, K., & Mathiyalagan, S. 2017)[14].

Based on laterality, majority of ptosis is unilateral ptosis in 169 patients (89.5%). The result of study by Hashemi et al and Wu et al showed that the majority of ptosis occurred unilaterally, namely 72% and 90%, respectively. In terms of cosmetic, unilateral ptosis can reduce level of patient's confidence. In addition, the consideration of decreased visual acuity and field of view is the reason for patients to come to health facilities. Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016[3], Irawati, Y. 2019)[8].

The majority of types of ptosis in this study were acquired ptosis in 111 eyes (53.2%). Research by Sarika et al stated the same results, namely more than 70% of patients with acquired type ptosis. The etiology of acquired ptosis includes myogenic, neurogenic, aponeurotic, traumatic, mechanical, and pseudoptosis causes. In this study, neurogenic ptosis was the most common etiology, occurring in 38 eyes (34.2%) followed by mechanical (24.3%) and traumatic (22.5%) ptosis. Research by Floyd et al and several other

studies mentions that neurogenic ptosis is a rare etiology. In this study, neurogenic ptosis rate was slightly higher than the study by Sarika et al, which was 22.7%. Several causes of neurogenic ptosis are related to the central nervous system such as cranial nerve III paralysis due to vascular disorders, inflammation, neurotoxicity, or compressive conditions. For this reason, many neurogenic ptosis conditions are referred to higher health facilities for adequate supporting examinations. Patients with suspected neurogenic ptosis who came to Indonesia National Eye Centre, Cicendo Eye Hospital are consulted to the neuro-ophthalmology department and further evaluation is carried out. Alamous, Assavedo Cra, Abouki COA, Godonou Nye, Sounouvou I, et al. 2017[7], Irawati, Y. 2019[8], Wu-Fienberg, Y., Bafna, K. R., & Guyuron, B. 2018)[8].

Degree of ptosis is divided into mild, moderate, and severe based on MRD 1. In this study, majority of patients had severe ptosis, namely 148 eyes (70.9%), and mostly were congenital ptosis. Research by Balasubrahanian et al stated that severe degree was second only to moderate degree, while according to Kim MH in his research in Korea, it was stated that severe ptosis increased with age, which was the opposite in this study, with majority of severe ptosis occurring at the age under 20 years. This is due to differences in the classification of the degree of ptosis used and the factor of parental awareness of changes in the child's eyelids affecting patient's onset of visit to health facilities. (Floyd, M.T., & Kim, H.J. 2021.[10], Thakre, S., & Poptani, S. 2020.[11], Kim, M. H., Cho, J., Zhao, D., Woo, K. I., Kim, Y. D., Kim, S., & Yang, S. W. 2017).[12].

The majority of levator function in this study was moderate in 139 eyes (66.6%). The levator function is useful for determining the surgery to be performed. In this study, 139 eyes (66.6%) underwent surgery. A total of 68 eyes (32.5%) underwent levator resection followed by frontal suspension (autograph and synthetic). Good to moderate levator function can be carried out with levator resection according to the results of this study. Meanwhile, for poor levator function, ligament suspension can be carried out. (Hashemi, H., Khabazkhoob, M., Emamian, M. H., Yekta, A., Jafari, A., Nabovati, P., & Fotouhi, A. 2016.[3], Thakre, S., & Poptani, S. 2020.[11], Hashemi, H., Nabovati, P., Dadbin, N., Heidari, Z., Yekta, A., Jafarzadehpur, E., Ostadimoghaddam, H., & Khabazkhoob, M. 2015. [15], Antus, Z., Salam, A., Horvath, E., & Malhotra, R. 2018).[16].

As many as 33.5% patients did not undergo surgery, but patients were observed, consulted to other units, referred to the neurology department, were carried out supporting examinations such as CT scans or MRIs, and some patients refused to undergo surgery. The majority of patients who were referred to the neurology department did not return to Indonesia National Eye Centre, Cicendo Eye Hospital for control. Research by Bacharach J et al mentioned that non-surgical management in ptosis patients includes observation, mechanical intervention, or medication. (Kim, M. H., Cho, J., Zhao, D., Woo, K. I., Kim, Y. D., Kim, S., & Yang, S. W. 2017.[12], Balasubrahmanian, K., & Mathiyalagan, S. 2017.[14], Hashemi, H., Nabovati, P., Dadbin, N., Heidari, Z., Yekta, A., Jafarzadehpur, E.,

Ostadimoghaddam, H., & Khabazkhoob, M. 2015).[15]

In this study, indicators of surgical success were classified into unilateral and bilateral. The success rate was assessed from preoperative and postoperative MRD 1 and FPV measurements. MRD 1 preoperatively for unilateral and bilateral ptosis were -0.12 ± 1.63 and -0.14 ± 1.78 , respectively. MRD 1 postoperatively for unilateral and bilateral ptosis were 2.67 ± 1.37 and 2.54 ± 1.65 , respectively. There was an increase in the results of MRD 1 preoperatively and postoperatively in both unilateral and bilateral ptosis. This is in accordance with the study by Ho YF et al which stated that there was an increase in MRD 1 postoperatively, namely an average of 0.02 ± 0.81 to 2.82 ± 0.59 mm both unilaterally and bilaterally. According to research by Lee CC et al, the width of the palpebral fissure has a positive correlation with MRD 1. Therefore, if there is an increase in MRD 1, the FPV will increase in parallel. (Antus, Z., Salam, A., Horvath, E., & Malhotra, R. 2018.[16], Lee, C. C., Feng, I. J., Lai, H. T., Huang, S. H., Kuo, Y. R., & Lai, C. S. 2019.[17], Yen, C. Y., Fang, I. M., Tang, H. F., Lee, H. J., & Yang, S. H. 2022).[18]

Recurrence and repeated surgery occurred in 3 eyes (2.2%) consisting of 1 unilateral congenital ptosis due to undercorrection. This can be caused by inaccurate preoperative levator function examination and MRD 1 because the patient is uncooperative and 2 unilateral aponeurotic ptosis caused by skinfold asymmetry. Research by Ho YF states that the risk factors for recurrence of congenital ptosis include the age of the child at surgery less than 1 year, inappropriate preoperative MRD 1 examination, cranial nerve III paralysis, postoperative wound

infection, postoperative entropion, and the formation of granuloma. In aponeurotic cases, patients must be educated about the possibility of postoperative events such as dermatochalasis which occurs over time so that the ptosis condition can recur. Research by Melicher J et al mentioned the risk factors for reoperation in cases of ptosis can be assessed preoperatively, intraoperatively, and postoperatively. (Lee, C. C., Feng, I. J., Lai, H. T., Huang, S. H., Kuo, Y. R., & Lai, C. S. 2019.[17], Yen, C. Y., Fang, I. M., Tang, H. F., Lee, H. J., & Yang, S. H. 2022.[18], Ho, Y. F., Wu, S. Y., & Tsai, Y. J. 2017.[19], Melicher, Jill & Nerad, Jefferey. 2011).[20]

Complications of lagophthalmos in this study occurred in 16 eyes (11.5%). Lagophthalmos occurs when the condition of the eyelids cannot close completely so that it can cause corneal exposure. In this study, majority of patients who came for follow-up 1 week and 3 week post-surgery were still in postoperative edema. According to study by Tucker et al, postoperative edema occurred 60% at 1 week post-surgery and persisted by 11% at 20 weeks post-surgery. Therefore, follow up must be carried out in the long term so that the results of surgery can be assessed optimally. (Yen, C. Y., Fang, I. M., Tang, H. F., Lee, H. J., & Yang, S. H. 2022.[18], Ho, Y. F., Wu, S. Y., & Tsai, Y. J. 2017.[19], Melicher, Jill & Nerad, Jefferey. 2011).[20]

The success rate in this study was 97.8%. Research by Ho YF has a success rate that is almost the same as this study, namely 97.2%. Another study by Alpogan O et al, has success rate of 91.6%. From these results it can be said that ptosis surgery has a high success rate if the preoperative assessment and selection of surgery are in accordance with each

patient's clinical condition. Ho, Y. F., Wu, S. Y., & Tsai, Y. J. 2017.[19], Melicher, Jill & Nerad, Jefferey. 2011).[20], Alpogan O, banaz a, İPÇİOĞLU a, CİN HUSEYİNOĞLU M, arslan m (2022).

Limitations in this study is the incompatibility entry of ICD-10 with medical record data. The patient follow-up time is short so that the assessment of ptosis, especially those undergoing surgery, is still not optimal. Further research is expected to examine each ptosis etiology and conducting longer follow-up.

CONCLUSION

The conclusion of this study was there were 189 patients (209 eyes) with diagnosis of ptosis from January 2016 to December 2020. The majority were female patients with a median age of 22 years. The majority of etiologies in this study were acquired ptosis with neurogenic ptosis as the most common etiology. The majority of patients in this study had severe ptosis and moderate levator function. The success rate in ptosis patients who underwent surgery was 97.2%.

The author hoped that this study can be used as a reference for improving eye health conditions, especially with regard to ptosis conditions in Indonesia National Eye Centre, Cicendo Eye Hospital and Indonesia so as to improve people's quality of life and optimal management of ptosis.

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