Outcomes of pterygium surgery by first-year ophthalmology residents

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Purpose: To evaluate outcomes of pterygium surgery by first-year ophthalmology residents at Thammasat hospital

Design: Retrospective study

Methods: Eighty-seven patients who underwent the pterygium excision by seven first-year ophthalmology residents at Thammasat hospital from July 2017 to June 2018 were enrolled. Characteristics of patients and pterygium, method of surgery, recurrence rate and complications were analyzed.

Main outcome measures: The primary outcome measure was recurrence of pterygium.

Results: The mean age of the patients was 58.5±11.7 years. Most of the participants were female (n=55; 63.2%). All cases have primary pterygium were single-headed (n=76; 87.4%), the rest were double-headed (n=11; 12.6%). Mean size of pterygium on the corneal surface was 6.2 mm^2 (0.8-17.5 mm^2 in range). Pterygium was excised by and grafted using amniotic membrane graft transplantation technique in 77 patients (88.5%) and conjunctival autograft transplantation technique in 10 patients (11.5%). The mean of follow-up duration was 8.2±3.1 months. There was recurrence of pterygium in 13 cases (14.9%), most of which (n=12; 92.3%) recurred within 6 months after surgery.

Conclusions: The outcomes of pterygium surgery operated by first-year ophthalmology residents at Thammasat hospital was satisfactory. The recurrent rate was not high and there were no serious complications.

Keywords: Pterygium surgery, Ophthalmology residents, Amniotic membrane transplantation, Conjunctival autograft transplantation, Recurrence

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Introduction

Pterygium, a wing-shaped centripetal growth of fibrovascular tissue on the superficial cornea, is a common disease in Thailand. Ultraviolet light is a major risk factor, so the prevalence of the disease is high among people in the peri-equatorial latitudes, mountainous and highly reflective environments.[1] The problems caused by pterygium include changes in corneal topography and refraction, reduction in

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visual field and visual acuity, chronic inflammation, dry eye, diplopia and cosmetic concerns. To treat the pterygium, patient' symptoms can be relieved by medications such as artificial tears, corticosteroid eye drops, although surgery still remains the definite treatment. One of the most important goals of pterygium excision is prevention of recurrence, which can be achieved by a well-performed surgical procedure, with good subsequent pre and postoperative care.

Generally speaking, in ophthalmology training courses, first-year ophthalmology residents are expected to be capable of independently performing pterygium surgery. Moreover, previousstudies showed that patient's age, gender, size and corneal involvement of pterygium, method of surgery and surgical experience are influential factors for pterygium recurrence.[2-4] To improve the training processes and surgical outcomes, we are interested in the results of pterygium surgery operated by first-year ophthalmology residents at Thammasat hospital.

Methods

Our study was approved by the Human Research Ethics Committee of the Faculty of Medicine, Thammasat University, Thailand. We performed a retrospective study by collecting data from medical records of patients who were undergone pterygium excision by first-year ophthalmology residents at Thammasat hospital over a period of one academic year, from July 2017 to June 2018. The subjects whose follow-up period less than 3 months were excluded.

Age and gender of patients, laterality and location, type of pterygium, number of pterygium heads, size of pterygium in square millimeters (calculated by 1/2 X horizontal length X vertical length), best corrected visual acuity (BCVA), keratometry, intraocular pressure, method of surgery, and intraoperative and postoperative complications were documented. Quantitative data were calculated as mean and standard deviation. Qualitative data were calculated into percentage. Paired t-test was used to compare pre and postoperative corneal astigmatism. Pearson Chi-Square was used to assess recurrent rate of pterygium and influencing factors including age, gender, number of pterygium heads, size of pterygium and surgical techniques. A p-value of less than 0.05 was considered to be statistically significant.

Results

Ninety-four participants were enrolled in our study but 7 of them were excluded for having a follow-up period of less than 3 months. (There were no complications or recurrence of pterygium in the excluded participants). 87 patients with a mean age of 58.5±11.7 years participated in this study, of those patients, 55 were females (63.2%), and 32 males (36.8%).

Each participant underwent pterygium excision in one eye. All cases of pterygium were diagnosed as primary in this study. Pterygium were single-head in 76 eyes (87.4%) and double-head in 11 eyes (12.6%), most of them (82.7%) were on the nasal side. Mean size of pterygium on the corneal surface was 6.2±4.4 square millimeters (0.8-17.5 in range).

There were 7 first-year ophthalmology residents operating in this study. Mean number of patients operated by each

surgeon were 12.4 with a range of 10-14 patients.

Seventy-seven patients (88.5%) had pterygium excision with amniotic membrane graft transplantation technique and 10 patients (11.5%) had surgery with conjunctival autograft transplantation technique.

Preoperative BCVA was equal or better than 20/40 in 48 participants (55.2%) and 3-month postoperative BCVA was equal or better than 20/40 in 68 participants (78.2%).

Corneal astigmatism was significantly decreased after pterygium excision (p=0.001, paired t test). The preoperative and 3-month postoperative corneal astigmatism mean was 2.1±1.6 and 1.5±1.1 diopter, respectively.

With regards to steroid responders, 16 participants (18.4%) had an increase of over 5 mmHg in intraocular pressure, nevertheless, the intraocular pressure was decreased after cessation of topical corticosteroids.

The follow-up time mean was 8.2±3.1 months, ranging from 3 to 12 months. Recurrent pterygium was defined as the encroachment of fibrovascular tissue across the limbus. During follow-up period, we found recurrence of pterygium in 13 cases (14.9%). Most of the recurrent cases (12/13; 92.3%) recurred within 6 months postoperative, which the mean of recurrence time was 4.2±1.9 months, ranging from 1 to 7 months. The number of operating eyes and recurrence eyes by each surgeon were shown in table 1.

Influencing factors that might affect recurrence of pterygium after excision were analyzed including age, gender, size of pterygium, number of pterygium heads and surgical technique. The result showed no statistical significance (*p-value* >0.05) were identified (as shown in table 2)

Discussion

There were some previous studies regarding recurrence rate of pterygium surgery performed by trainee ophthalmologists. Kositphipat et al.[5] and Akrapipatkul K.[6] from Thailand reported a recurrence rate of 9.7% and 11.94% respectively, in addition to Farrah et al.[7] from Australia reported 19.4%. Our study found a 14.9 percent recurrence rate.

In this study, most of the recurrent cases (92.3%) recurred within 6 months postoperatively, corresponding with

Table 1 Number of eyes operated eyes by each surgeon and recurrence rate per individual surgeon

Surgeon	Number of eyes operated (%)	Number of eyes with recurrence (%)
A	12 (13.8)	2 (16.7)
B	13 (14.9)	3 (23.1)
C	14 (16.1)	3 (21.4)
D	12 (13.8)	1 (8.3)
E	10 (11.5)	2 (20.0)
F	13 (14.9)	1 (7.7)
G	13 (14.9)	1 (7.7)
Total	87 (100)	13 (14.9)

Table 2 Number of recurrences according to influencing factors

variable	Number of recurrence N (%), n = 13	*p-value* (Chi-squared)
Age (years)		
< 40 years (n = 6)	1 (16.7)	0.902
≥40 years (n = 81)	12 (14.8)	
Gender		
Male (n = 32)	4 (12.5)	0.626
Female (n = 55)	9 (16.4)	
Number of pterygium heads		
Single-head (n = 76)	11 (14.5)	0.784
Double-head (n = 11)	2 (18.2)	
Size of pterygium (horizontal)		
< 4 mm (n = 57)	7 (12.3)	0.337
≥4 mm (n = 30)	6 (20.0)	
Surgical technique		
Amniotic membrane graft (n = 77)	12 (15.6)	0.641
Conjunctival autograft (n = 10)	1 (10)	

previous literature. Kositphipat et al.[5] found that all recurrences (100%) occurred within 6-month postoperatively. Kampitak and Bhornmata8 reported most eyes (73.8%) recurred within 20 weeks.

Individual surgeon recurrence rate in this study was variable, ranging from 7.7 to 23.1%. Kositphipat et al.[5] found a high variation in the recurrence rate (0-25%). Ti et al.[4] also showed an even wider range of recurrence rate from 5 to 82%.

Previous studies showed that young age[3, 9-11], male gender[9, 12], bigger size and large area of corneal involvement of pterygium[13] and surgical technique[14-16] are influencing factors for pterygium recurrence. Nevertheless, our study did not demonstrate statistical significance in any of those previously mentioned significant risk factors for the recurrence of pterygium. This may be due to the small sample size in our study.

The practice of pterygium excision at Thammasat hospital favors amniotic membrane transplantation method over conjunctival autografting due to the fact that this procedure is less time consuming, has favorable early recovery outcomes, and saves the conjunctiva for future surgery if required. Moreover, Akrapipatkul from Thailand reported that pterygium excision with sutured amniotic membrane transplantation is considered an appropriate training procedure for ophthalmology residency training due to the duration needed to reach the learning curve.[6]

Outcomes of pterygium surgery in our study were favorable as demonstrated by improvements in visual acuity and significant decreases of corneal astigmatism. The number of patients who had BCVA

equal or better than 20/40 increased from 55.2% preoperative to 78.2% 3-month postoperatively. Kositphipat et al. showed 19.4% of patients had vision gained equal or more than one line postoperatively.[5]

For the present study, the corneal astigmatism was significantly decreased after pterygium excision and it could be one factor for improvement of visual acuity.

After pterygium surgery, steroids are used to reduce inflammation, although ocular hypertension is a common side effect. Kampitak and Bhornmata[8] suggested 10.2% of eyes prescribed ocular steroids had an increase of intraocular pressure of over 5 mmHg. In our study, 18.4% of eyes had increased intraocular pressure of more than 5 mmHg after steroid use. Therefore, patients receiving steroids should undergo close monitoring.

Surgical training in ophthalmology residents at Thammasat hospital allows residents to practice surgical techniques by wet-laboratory and workshop training prior to performing ocular surgery on patients. This method could be one factor of improving the surgical performance in ophthalmology residents, shortening the learning curve and decreasing the surgical morbidity and the risk of iatrogenic trauma.

Conclusions

The outcome of pterygium surgery operated by first-year ophthalmology residents at Thammasat hospital was satisfied. Corneal astigmatism was significantly decreased after pterygium excision. The recurrent rate was not high and there were no serious complications.

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Conflicts of interest

The authors have no conflict of interest.

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