

# Combined Bare Sclera and Pedunculated Conjunctival Flap for the Treatment of Pterygium : A Preliminary Report

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**ABSTRACT : Purpose :** To determine safety and efficacy of the combined bare sclera and pedunculated conjunctival flap as a new technique for pterygium surgery.

**Methods :** A retrospective study was performed in 8 eyes of 5 patients with primary pterygium who had undergone a pterygium excision followed by the combined bare sclera and pedunculated conjunctival flap technique. Patients were followed-up for recurrence and complications for at least 6 months.

**Results :** The mean follow-up time was 26 months (range 6-40 months). The mean age was 57.6 years (range 44-66 years). The recurrence rate was 0%. The only complication was a small haemorrhage under the flaps in 4 eyes (50%) which disappeared within 2 weeks.

**Conclusion :** A combined bare sclera and pedunculated conjunctival flap in the management of primary pterygium is an effective, simple and safe technique especially for those who might need glaucoma surgery in the future, bilateral heads, cases when it is not possible or undesirable to use the superior conjunctiva for grafting. The risk of pterygium recurrence is very low.

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**Keywords :** pterygium, recurrence, bare sclera, pedunculated conjunctival flap

## Introduction

Pterygium is a common form of conjunctival degeneration found in equatorial countries and those who have had prolonged exposure to ultraviolet radiation or sunlight.<sup>1</sup> In the past, it was believed to be caused by a degenerative change. But more recent researches in ocular surface cell biology have led to the recognition that pterygium is an ocular surface growth disorder secondary to UV-B induced p53 mutations in limbal epithelial cells.<sup>2,3</sup>

The bare sclera technique is the simplest surgical technique for pterygium excisions but has a high recurrence rate of 14-73%.<sup>4</sup> Various techniques were developed to reduce the rate of recurrence such as conjunctival flap,<sup>5-8</sup> conjunctival rotation autograft,<sup>9,10</sup> conjunctival autograft,<sup>4,11</sup> and amniotic membrane transplantation.<sup>11,12</sup> Adjunctive therapies such as beta irradiation, mitomycin C, and thiotepa have been used with the bare sclera technique.<sup>4</sup> However, they may cause such complications as scleral necrosis, corneal edema, secon-

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dary microbial infection, glaucoma, corneal ulceration and cataract<sup>13-17</sup> It would be ideal if there was a technique that did not require potentially dangerous drugs or radiotherapy and had a low recurrence rate.

In this study, we examine a new technique, the combined bare sclera and pedunculated conjunctival flap, to determine the recurrence rate and complications.

### Materials and Methods

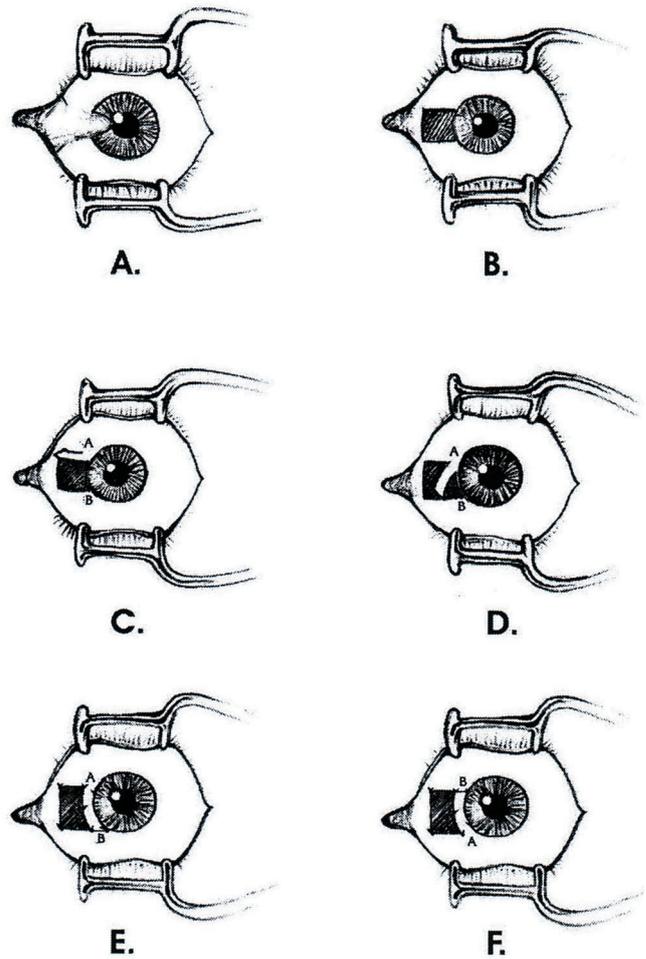
#### Study design

This study was approved by the Ethics committee, Faculty of Medicine, Prince of Songkla University. Five patients, underment pterygium surgery with this technique between February 1, 2003 and September 30, 2003, were included in this study. A minimum follow-up period of 6 months was required. Recurrence was defined as the presence of fibrovascular tissue invading the cornea. The patients' records were reviewed for biographic details, date of surgery, laterality, complications, recurrence, and the follow-up time.

#### Surgical procedures

All patients had primary pterygium removal followed by the combined bare sclera and pedunculated conjunctival flap sliding from superior or inferior conjunctiva.

The procedure was performed by one surgeon (HO) under microscope using a tetracaine hydrochloride 0.5% eye drop and an eye speculum. Approximately 0.25 ml of 2% lidocaine with 1 : 80,000 adrenaline was injected under the pterygium (Figure 1A). The pterygium and the subconjunctival tissue were excised with a #



**Fig. 1A** pterygium after subconjunctival lidocaine injection. B, bare sclera after pterygium head and body removal. C and D, pedunculated conjunctival flap was created and rotated along the limbus from superior conjunctiva. E, the final sutured position of the flap. F, flap from the inferior conjunctiva.

15 blade and scissors, leaving bare sclera (Figure 1B). The size of subconjunctival tissue removed was slightly larger than the size of the removed pterygium body. Cauterization was done to achieve haemostasis. The corneal surface was smoothed using the # 15 blade. The length of the A-B was measured with calipers and then a conjunctival flap of 2 millimeters in width and A-B in

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length was created from superior or inferior conjunctiva (Figure 1C). The flap was rotated along the limbus (Figure 1D) and then secured with 4 interrupted sutures (nylon 10-0) to the episclera. Two interrupted sutures were also placed down along the conjunctival wound edge of the bare sclera (Figure 1 E, F). A pressure patch was applied.

Postoperatively, topical chloramphenicol-beta-methasone eye drop was administered 4 times a day for

4-6 weeks, the patients were followed up at day 1, 1 week, 1, 3, 6 months and then every 3-6 months. Sutures were removed at 1 week.

### Results

Nine eyes of 5 patients underwent a pterygium excision with the combined bare sclera and pedunculated conjunctival flap technique. One eye was excluded because the follow-up time was less than 6 months. Eight

**Table 1** Demographic data and results.

case No.	age (years)	sex	eye	date of surgery	follow-up (month)	recurrence	complication	comment
1	49	M	RE	6 Jun 03	38	No	-	-
2	63	F	RE	1 Aug 03	6	No	-	-
			LE	18 Apr 03	9	No	haemorrhage under the flap	-
3	44	M	RE	12 Sep 03	34	No	haemorrhage under the flap	white tissues on both
			LE	1 Aug 03	35	No	-	cornea at 3, 4 months and faded away over time
4	66	F	RE	4 Apr 03	39	No	-	-
			LE	21 Mar 03	40	No	haemorrhage under the flap	-
5	66	F	LE	7 Feb 03	7	No	haemorrhage under the flap	-

RE = right eye ; LE = left eye ; M = male ; F = female

eyes with a follow-up time of more than 6 months were included in this study. Three patients had pterygium surgery in both eyes (Table 1). There were 3 females and 2 males. The average age was 57.6 years (range 44-66 years). All patients had primary pterygium at the nasal aspect. The mean follow-up time was 26 months (range 6-40 months).

No recurrent pterygium was identified in any eye. This represented a 0% recurrence rate. But both eyes of case 3 had faint white tissues extended across the limbus that faded away over time and only corneal scars left at last visit. Four eyes (50%) had small haemorrhage under the flaps that resolved within 2 weeks. No other complication was found.

### Case Report

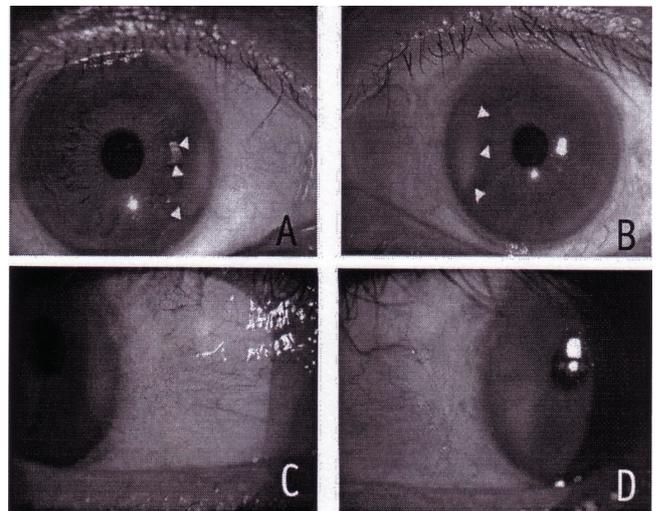
**Case 1.** A 49 year-old man with pterygium in his right eye. The previous pterygium excision with a conjunctival autograft in his left eye (3 years ago) recurred after 6 months. The pterygium excision was done with the new technique. The corneal epithelium healed



**Fig. 2** No recurrence at 38 months postoperatively.  
(ภาพสั้ท้ายเล่ม)

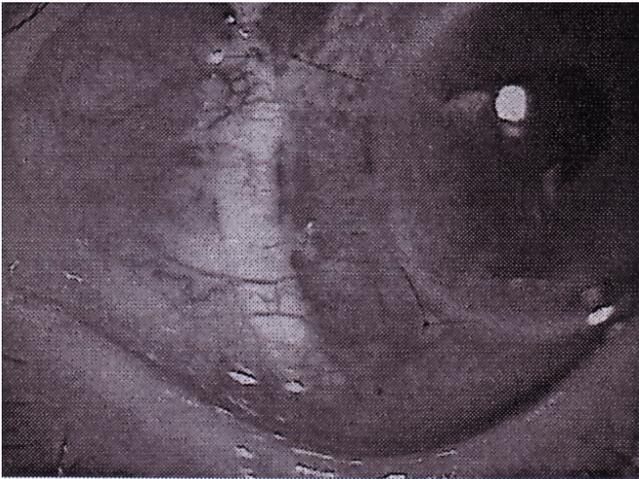
within 3 days and the flap was good. At 38 months postoperatively, there was no recurrence (Figure 2).

**Case 3.** A 44 year-old man with bilateral pterygia and high myopia of -20 diopters. He had had an uneventful phacoemulsification with intraocular lens (IOL) implantation in both eyes 4 months earlier. He underwent a pterygium excision with the new technique in both eyes. During the early postoperative period, a small subconjunctival haemorrhage under the flap in his right eye was observed for a few weeks. However, at 3 months in the right eye and 4 months in the left eye, white tissues extending across the limbus into the cornea with fine vessels were observed in the right eye. The flaps were still good. At 34 and 35 months postoperatively, the white lesions faded and left only corneal scars. The fine vessels in the right limbus remained unchanged (Figure 3 A, B, C, D). The patient was satisfied.

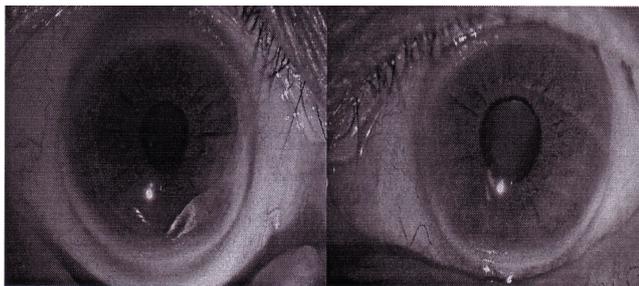


**Fig. 3** A and B, at 3 and 4 months postoperatively, there were white tissues extending from limbus into the cornea (arrowheads). C and D, at 34 and 35 months, the tissues were faint and left only corneal scars in both eyes with fine vessels at the limbus in the right eye. (ภาพสั้ท้ายเล่ม)

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**Fig. 4** One week postoperatively with haemorrhage under the flap. (ภาพสัปดาห์แรก)



**Fig. 5** At 39 and 40 months postoperatively, there was no recurrence. (ภาพสัปดาห์แรก)

**Case 4.** A 66 year-old female with bilateral pterygia had a pterygium excision with the new technique in March and April 2003, respectively. At 1 week postoperatively, there was a haemorrhage under the flap in her left eye which disappeared at 2 weeks (Figure 4). During the last follow-up, 39 and 40 months postoperatively, no recurrence was observed in either eyes (Figure 5).

### Discussion

The major problem in the surgical treatment of pterygium is recurrence. Many new techniques aiming to

minimize the recurrence are available. The bare sclera is the simplest technique but has a high recurrence rate of 14-73%.

Fibroblasts play a significant role in the recurrence of pterygium.<sup>18,19</sup> Analysis of the mean proliferation indices (MPIs) in subepithelial fibrovascular tissue of the recurrent pterygium showed markedly high levels of MPIs compared to that in primary pterygium<sup>20</sup> (73.75 VS 7.3 ;  $p = 0.003$ ).

We introduced this new technique combining the bare sclera and pedunculated conjunctival flap. Our hypothesis in the recurrence of pterygium following a conjunctival graft or flap is that the growth of the fibrovascular tissue around the conjunctival edge underneath the graft or flap occurs before any strong adhesion to the episclera takes place especially in chemosis or haemorrhage under the graft or flap. However, with this technique, the flap would already be attached to the episclera by the time of the fibrovascular tissue arriving. In consequence, the conjunctival flap becomes the barrier preventing recurrence. Moreover, the conjunctival edge along the bare sclera is fixed with 2 stitches to prevent sliding. The flap can be rotated either from the superior or inferior conjunctiva.

The advantages of our technique are : 1. a short operation time, 2. easy to perform, 3. the healing process is quicker due to the blood supply of the flap, 4. no chance of flap loss or wrong side, 5. preservation of healthy conjunctiva, 6. no other graft is needed such as the amniotic membrane, 7. no adjunctive treatment is required, 8. no need of tissue glue.

Our result had a 0% recurrence rate although

both eyes of case 3 had white tissues with fine vessels invading the cornea. It looked like epithelial hyperplasia found on the head of pterygium rather than fibrovascular tissue. It faded away over time and left only corneal scars. So we did not consider these eyes as recurrence. The patient was satisfied.

Nowadays, there is the new technique that use tissue glue to fix autologous conjunctival graft in stead of sutures. This technique causes significantly less postoperative pain, shortens surgical time<sup>21</sup> and significantly lower recurrence rate compare to sutures.<sup>22</sup> However the tissue glue is costly and available only in some places.

In conclusion, the pterygium excision with the combined bare sclera and pedunculated conjunctival flap technique appears to be an effective, simple and safe procedure to prevent the recurrence of pterygium. It is suitable for patients with glaucoma, bilateral head pterygia and when tissue glue is not available.

Our study has the limitation of a small sample size. Further study with a large sample size and a prospective randomized control trial with other techniques should be undertaken.

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# การผ่าตัดลอกต้อเนื้อด้วยวิธี Bare Sclera ร่วมกับ Pedunculated Conjunctival Flap : รายงานเบื้องต้น

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**บทคัดย่อ**     **วัตถุประสงค์** : เพื่อศึกษาความปลอดภัยและประสิทธิภาพของการผ่าตัดลอกต้อเนื้อด้วยวิธี bare sclera ร่วมกับ pedunculated conjunctival flap

**วิธีการ** : เป็นการศึกษาแบบ retrospective โดยการรวบรวมข้อมูลจากเวชระเบียนผู้ป่วยนอกและบันทึกการผ่าตัดในผู้ป่วย 5 ราย รวม 8 ตา ที่ได้รับการผ่าตัดลอกต้อเนื้อด้วยวิธีนี้ โดยต้องมีการติดตามผลการผ่าตัดต้อเนื้ออย่างน้อย 6 เดือน

**ผลการรักษา** : ระยะเวลาติดตามการรักษาเฉลี่ย 26 เดือน (6-40 เดือน) อายุเฉลี่ย 57.6 ปี (44-66 ปี) อัตราการกลับเป็นซ้ำของต้อเนื้อเท่ากับ 0% ผลข้างของการผ่าตัดพบเพียงเลือดออกใต้เยื่อぶตา 4 ตา คิดเป็น 50% ซึ่งหายได้เองภายใน 2 สัปดาห์

**สรุป** : การผ่าตัดลอกต้อเนื้อด้วยวิธี bare sclera ร่วมกับ pedunculated conjunctival flap เป็นวิธีที่มีประสิทธิภาพ ทำได้ง่าย ปลอดภัย เหมาะกับผู้ป่วยที่อาจต้องมีการทำผ่าตัดรักษาต้อหินในอนาคต ผู้ป่วยที่มีต้อเนื้อ 2 หัว หรือผู้ป่วยที่ไม่สามารถใช้วิธีการผ่าตัดปลูกถ่ายเยื่อぶตาของตนเอง โดยการผ่าตัดวิธีนี้มีโอกาสกลับเป็นซ้ำต่ำ **จักษุเวชสาร 2549 : มกราคม-มิถุนายน 20(10) : 53-60.**

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