

Doubt flap technique in pterygium surgery

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Abstract

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Background: A pterygium is a triangular fibrovascular sub-epithelial ingrowth of degenerative bulbar conjunctival tissue over the limbus onto the cornea. The mainstay of treatment is surgery with more measures to decrease the recurrence rate. Pterygium doesn't need intervention unless there is an extension of the lesion towards the center of the cornea and it encroaches on the visual axis, or is symptomatic in terms of redness and discomfort.

Objective: To present a new surgical technique for managing primary pterygium. We aim to find a more effective method than the one previously used. We wanted to demonstrate and prove that this technique has low recurrence rates.

Patients and Methods: A Hospital-based interventional case series study, sampling done by simple random sampling from the outpatient departments. The study was conducted in the ophthalmology department of Erbil teaching hospital in Erbil city for eight months from August 2021-April 2022. In the current study 40 patients with pterygium were operated that they were attending the ophthalmology department in this hospital.

Results: The result revealed 3 cases of recurrence of 7.5% out of 40 cases using a dual flap technique as a new approach for treating pterygium in the follow-up of 3 months, in which the mean \pm SD of age was 46.3 ± 10.537 years. Twenty four cases were female, and 16 were male; all of the lesions were nasally located pterygium. In the sample we used in the study 5 patients had had pterygium excision using other techniques in the past at least once, and neither of them recurred utilizing this approach.

Conclusion: The double flap is a proper alternative technique in pterygium surgery; this new procedure, dual conjunctival flap with 7.5% recurrence rates and provides safe and comparable results to current methods.

Keywords: Doubt flap , pterygium , surgery

Introduction

A pterygium (plural pterygia) is a triangular fibrovascular sub-epithelial ingrowth of degenerative bulbar conjunctival tissue over the limbus onto the cornea. It typically develops in patients living in hot climates and may represent a response to ultraviolet exposure and other factors such as chronic surface dryness [1].

Histopathologically exhibiting elastotic collagen degeneration within vascularized sub-epithelial fibrovascular tissue and destruction of Bowman's membrane. Epidemiological point of view, the more the proximal to the equator, the more is the prevalence, it's more common in males than

females, in 20-30 years of age, and also in people who are outdoors [2].

Risk factors for the development of pterygium including long periods exposure to UV and other environment's factors such as glare, dust, wind and heat. Exogenous irritants may also play a role in the formation of pterygium (pollen, dust particles) through an inflammatory reaction in conjunction with type 1 hypersensitivity reaction, and genetic predisposition [4,5].

Clinical manifestations of pterygium range from asymptomatic to a wide range of redness, swelling, itching, irritation, and blurring of vision with an elevated lesion on the surface of the conjunctiva and adjacent cornea in one or both eyes [6,7]. Most commonly, they are located nasally but may occur on a temporal side or in other locations [8].

Pterygium doesn't need intervention unless there is an extension of the lesion towards the center of the cornea and it encroaches on the visual axis, or is symptomatic in terms of redness and discomfort [9].

Because of the high recurrence rate, there have been continuous efforts to find new techniques. And the surgical options include the bare sclera technique, transposition of pterygium to the fornix, excision with a simple closure of the wound, limbal conjunctival autograft, and amniotic membrane graft [10,11].

There have been many techniques for the excision of pterygium over the years; nearly all of them need one or more than once surgeries. Up to 92% of recurrence rates have been reported [12].

The purpose of this study was to present a new surgical technique for managing primary

pterygium. We aim to find a more effective method than the one previously used. We wanted to demonstrate and prove that this new technique has low recurrence rates.

Patients and Methods

This study was a Hospital based interventional case series study, sampling done by simple random sampling from the outpatient departments; the study was conducted in the ophthalmology department of Erbil teaching hospital in Erbil city for eight months from August 2021-April 2022 in the current study of 40 patients with pterygium were operated that they were attending the ophthalmology department in this hospital. The average age of patients is 46.3 years ranging from 20-67 years. All of them had nasally located pterygium and signed informed consent.

The exclusion criteria were patients with non-nasal pterygium, pseudo pterygium, eyes with astigmatism apart from a corneal cause, and patients with a history of diabetic Mellitus, corneal disease, eye trauma, or previous intra-ocular surgery were excluded from the study. Surgical procedure: After the patients had been informed about the course of the operation and postoperative management written informed consent for the procedure was obtained from each patient. The operation was accomplished utilizing an operating microscope in the operating room. The eye undergoing surgery was prepared and draped in the usual sterile fashion.

The basic procedure of pterygium surgery includes administration of Topical anesthesia (drop installed to the affected eye), and Speculum inserted, then subconjunctival Anesthesia with 4% lignocaine (Xylocaine) containing 1:10000 adrenaline (epinephrine)

applied under pterygium mass. The pterygium tissue at the limbus is cut with Vannas scissors. Then the pterygium body is allowed to retract the nasal fornix after any adhesion in the sub-conjunctiva is released. Care should be taken to avoid dissecting the stroma of the cornea. Immediately after the avulsion of a pterygium from the cornea, a superior and inferior Peritomy incision through the conjunctival limbus with superior and inferior extension is performed. Paid attention to involving conjunctival polarity of limbal stem cells. One or two stitches (using zero seven Vicryl) are applied to approximate the superior to the inferior flap and suturing in the midline than the stitch embedded under the flap. Any abnormal scars or conjunctival

tissue on the cornea surface were removed with a no.15 blade. As shown in figure 1, The patients were followed up for three months, looking for recurrences or complications.

The researchers designed the questionnaire through a review of relevant literature. Which are 17-item questionnaires designed for a quick assessment of some demographic data, size, and degree of pterygium and its recurrence rate.

Statistical Analysis

The data were entered and analyzed using a statistical package of a social science computer program (SPSS version 21). Descriptive statistics were used to calculate frequency, means, and stander deviation.

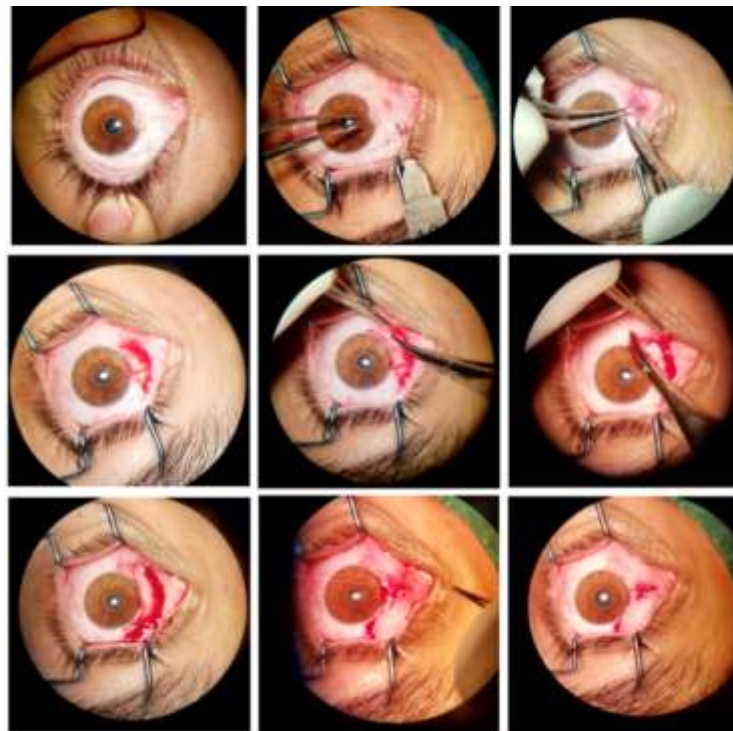


Figure (1): photographs of different stages of surgical procedure

Results

A total of 40 eyes for 40 patients underwent a double flap approach after pterygium excision. There were 16 male (40%) and 24 female (60%) patients. 21 were unemployed,

with five indoor and 14 outdoor occupations. Only 12 of them were wearing glasses. The right eye was the diseased eye in 21 of them, as shown in Table (1).

Table (1): Sample distribution by gender, residence, occupation, outdoor time, wearing glass, and eye operated

Variables		frequency	Percentage
Gender	Male	16	40
	Female	24	60
Occupation	Indoor	5	12.5
	Outdoor	14	35
	unemployment	21	52.5
Outdoor time	<4 hrs.	21	52.5
	>4 hrs.	19	47.5
Wearing glass	Yes	12	30
	No	28	70
Eye operated	Right	21	52.5
	Left	19	47.5
Previous surgery	Yes	5	12.5
	No	35	87.5

The mean of pterygium size in millimeters, including vertical diameter and corneal involvement, are 3.4 and 2.4, respectively. The decimal visual acuity of the patients before doing the operation ranged from 0.16-

1 with a mean of 0.698. The minimum degree of astigmatism in the patients was -8.75, and the maximum degree was 1.25, all shown in Table (2).

Table (2): Minimum, maximum, mean, and stander deviation among variables including age, size of pterygium, visual acuity, and degree of astigmatism

Variables	Minimum	Maximum	Mean	Std. Deviation
patient's age	20	67	46.30	10.537
vertical diameter of pterygium in mm	1.00	6.00	3.4313	1.29222
corneal involvement of pterygium in mm	1.00	5.00	2.4188	.94799
decimal visual acuity	.16	1.00	.6958	.28384
degree of astigmatism	-8.75	1.25	-1.1500	1.82469

Out of 40 eyes, only 2 were complicated by the formation of granulation tissue at the suture site.

Five patients (12.5%) patient treated had had previous pterygium surgery using other techniques, and none of them showed recurrence. A total of 3 recurrences (7.5%)

were found by the end of 3rd month Figure (1). All three cases recurred are living in urban areas, their pterygium sizes were among the largest ones among the patient, their duration of more than one year and none of them were wearing glass. The recurrent lesions were flat and not inflamed generally.

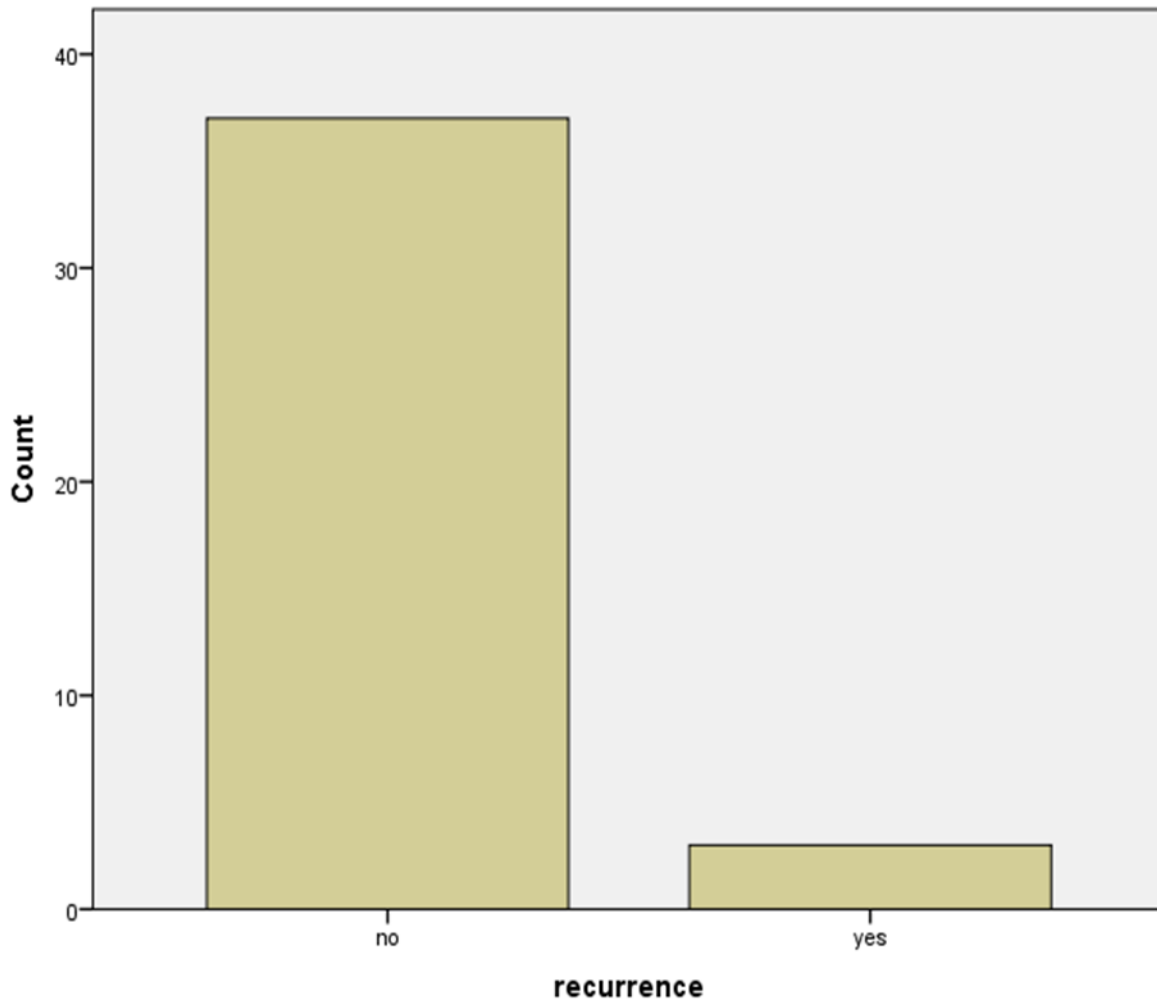


Figure (1): Percent rate of recurrence in double flap technique

Discussion

Current surgical methods to prevent pterygium recurrence include conjunctival autograft, limbal and limbal-conjunctival transplant, conjunctival flap and conjunctival rotational autograft surgery, amniotic

membrane transplant cultivated conjunctival transplant, lamellar keratoplasty, fibrin glue, and suture-less and glue-free conjunctival autograft” [13].

The recurrence rate was 7.5% in this study which is mentioned above. The explanation

of the success and low recurrence rate referred to the involvement of stem cells from limbal cell polarity. Compared with other techniques, it's superior to bare sclera excision with a recurrence rate of (30%-80%) which is unacceptably high and that's why adjuvant therapy is needed [14].

The use of intra-operative Mitomycin-c as an adjuvant therapy has a recurrence rate ranging from 10.5% [15] to 38% [16]. Its use is associated with sever complications such as; secondary glaucoma, cataract, corneal edema and perforation, scleritis, iritis, and scleral calcification [17,18].

The double flap recurrence rate is within the range of conjunctival autograft technique recurrence (2%-39%), which is the most widely used and preferred procedure [14].

Despite the low recurrence rate of conjunctival flap 1-5% compared to our procedure, it is not acceptable [19].

Limbal conjunctival autograft surgery recurrence rate ranges from 0-15% [20]. 4% recurrence with conjunctival rotation autograft surgery has been delineated [21].

The three techniques mentioned above regarding recurrence are close to our procedure.

Amniotic membrane graft recurrence is 12%-40%. [22] which again is higher than the recurrence rate in this study's technique.

The advantages of the double flap technique are: (1) it is easy to perform; any experienced surgeon can complete the whole procedure within 10 minutes. (2) a limbal portion of each flap in the dual flap technique preserves limbal stem cell polarity while providing adequate closure tissue. (3) The barrier formed by both flaps may play an important role in the prevention of recurrence. (4) No

adjuvant treatment, such as the installation of Mitomycin-C , is required.

The limitations of our study were the small sample size and the short follow-up time of 3 months. While there is an article that compared techniques of pterygium surgery, the mean recurrence time was four months [23].

Conclusions

Double flap is a proper alternative technique in pterygium surgery; we found this procedure with 7.5% recurrence rates and provided safe and comparable results to current methods.

Recommendations

More detailed study comparing this new technique with conjunctival autograft is recommended to see which method is better in term of outcome and recurrence.

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Ethical clearance: Ethical approval was obtained from the College of Medicine / University of Diyala ethical committee for this study.

Conflict of interest: Nil

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جراحة الظفرة بطريقة رقعة الملتحمة المزدوجة

احمد عبد الغني¹

المخلص

خلفية الدراسة: الظفرة عبارة عن نمو ثلاثي ليفي وعائي لنسيج الملتحمة التنكسي على القرنية. الدعامة الأساسية للعلاج هي الجراحة بمزيد من الإجراءات لتقليل معدل التكرار. الظفرة لا تحتاج إلى تدخل ما لم يكن هناك امتداد الاليف باتجاه مركز القرنية وتتعدى على المحور البصري أو تظهر عليها أعراض من حيث الاحمرار وعدم الراحة.

اهداف الدراسة: لتقديم تقنية جراحية جديدة لإدارة الظفرة الأولية. نحن نهدف إلى إيجاد طريقة أكثر فعالية من تلك المستخدمة سابقاً. أردنا إثبات أن هذه الطريقة لها معدلات تكرار منخفضة.

المرضى والطرائق: دراسة سلسلة الحالات على مستوى المستشفى ، وأخذ العينات عن طريق أخذ عينات عشوائية بسيطة من أقسام العيادات الخارجية ، وأجريت الدراسة في قسم طب العيون في مستشفى أربيل التعليمي في مدينة أربيل لمدة ٨ أشهر من أغسطس ٢٠٢١ إلى أبريل ٢٠٢٢ ، في الدراسة الحالية أجريت على ٤٠ مريضاً مصاباً بالظفرة حيث كانوا يحضرون إلى قسم طب العيون في هذا المستشفى.

النتائج: كشفت النتيجة ٣ حالات تكرار بنسبة ٧,٥٪ من أصل ٤٠ حالة باستخدام تقنية الرقعة المزدوجة كنهج جديد لعلاج الظفرة في متابعة لمدة ٣ أشهر ٢٤ حالة من الإناث و ١٦ حالة من الذكور في العينة التي استخدمناها في الدراسة ، خضعت ٥ حالات لاستئصال الظفرة باستخدام تقنيات أخرى في الماضي مرة واحدة على الأقل ولم يتكرر أي منهما باستخدام هذا النهج.

الاستنتاجات: الرقعة المزدوجة هي تقنية بديلة مفيدة في جراحة الظفرة ، هذا الإجراء الجديد هو الرقعة المزدوجة الملتحمة ، مع معدلات تكرار ٧,٥٪ وقدمت نتائج آمنة وقابلة للمقارنة مع الطرق الحالية .

الكلمات المفتاحية: الرقعة المزدوجة ، الظفرة ، جراحة

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