

Modified Bare Sclera method for the treatment of primary pterygium: A preliminary report

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Summary

Introduction: The bare sclera technique is still in use by many surgeons worldwide in spite of the attendant high recurrence rate. Any modification of this well known procedure may be more widely acceptable if associated with lower recurrence.

Method: The bare sclera technique was modified by performing a partial thickness sclerectomy from the pterygium bed. This modified technique was applied to 23 eyes of 17 patients with primary pterygium. The subjects were followed up for varying periods between 8 to 31 months to determine the recurrence rate of pterygium after surgical excision and other complications.

Results: Initial observation showed that the recurrence occurred in two eyes of two patients of a series who were followed up for a minimum of six months and up to thirty-one months. Two other eyes developed suture granuloma. There were no other complications observed in the remaining twenty eyes of fifteen patients.

Conclusion: Partial thickness sclerectomy when performed with standard bare sclera technique seems promising and may improve the results of pterygium excision by bare sclera method.

Keywords: Pterygium excision, Bare sclera with sclerectomy, Recurrence rate.

Résumé

Introduction: La technique de la sclérose nue est toujours d'usage courant par beaucoup de chirurgiens partout dans le monde entier en dépit de taux élevé de la récurrence concomitantes. N'importe quelle modification de cette méthode bien connue pourrait être plus acceptable largement par rapport à la récurrence base.

Méthode: La méthode de la sclérose nue était modifiée à travers une opération d'une sclérectomie d'une épaisseur partielle à partir du lit de ptérygion. Cette méthode améliorée était appliquée aux 23 yeux des 17 patients atteints de la ptérygion première. Les sujets ont reçu des soins post-hospitaliers pendant la période diverse entre 8 au 31 mois afin de déterminer le taux de la récurrence du ptérygion après l'excision chirurgicale et d'autres complications.

Résultats: L'observation de début avait indiqué que la récurrence était arrivée dans deux yeux des deux patients d'une série chez lesquels on avait fait des soins post-hospitaliers pendant un minimum de six mois jusqu'au trente-un mois. Les deux autres yeux ont développé granulome suture. Il n'y avait aucune complication remarquée chez les autres vingt yeux de quinze patients.

Conclusion: Sclérectomie d'une épaisseur partielle quand opérée avec la méthode de la sclérose nue de référence ou de série paraît prometteuse et pourrait améliorer les résultats d'excision

ptérygion à travers la méthode de la sclérose nue.

Introduction

Various attempts have been made to reduce the rate of recurrence associated with pterygium excision by modifications in the surgical techniques but no technique has so far been perfect enough to stop this recurrence. The best modification seems to be bare sclera method with conjunctival autograph^[1].

Post operative recurrence rates following bare sclera resection range from 24% to 89%²⁻⁵. With bare sclera resection with mitomycin application reported recurrence rate varied between 10 – 38%^{6,7} and when conjunctival autograft is applied, recurrence rate varied between 2% to 39%^{3-5,8}. In the present series of cases, a bare sclera technique originally described by D'ombrain^[9] was modified by performing the bare sclera technique and in addition excising a third partial thickness scleral flap 5mm vertical by 3mm horizontal from the scleral bed of the pterygium adjacent to the limbus. This technique described as bare sclera excision with partial sclerectomy was used in the treatment of patients with primary pterygium in a preliminary study with a view to determine the recurrence rate, other initial and late complications associated with this technique.

Materials and method

Seventeen consecutive patients who presented to the eye clinic of University College Hospital (UCH) and a non-governmental eye clinic both in Ibadan were prospectively studied after informed consent was obtained. Using precoded questionnaire, sociodemographic data were obtained, history of previous eye surgery were ascertained. Visual acuity was measured with standard Snellens chart. Patients with other associated eye diseases were excluded. The position, extent, and type of the pterygium was noted. The position of pterygium was either medial, temporal or double. Extent of pterygium was graded using the following criteria: Group 1 pterygia were those extending to less than 2mm of cornea, Group 2 were pterygia covering greater than 2mm and less than 3mm into cornea, Group 3 were pterygia extending for more than 3mm into cornea, almost similar to the grading used by the author in a previous study^[2].

The type of pterygium was either atrophic or vascular. All the subjects had pterygium excision by the bare sclera method with partial thickness sclerectomy as described in details below.

Technique

The bare sclera resection of pterygium as described by D'ombrain^[9] was modified. The head of the pterygium was shaved off cornea and its body was dissected from conjunctiva above by blunt dissection until orbital fat was exposed.

The pterygium was bluntly dissected from underlying sclera and muscle and then excised. A third partial thickness sclera flap 5mm vertically by 3mm horizontally was raised from the sclera bed measuring from limbus, this sclera flap was excised. Cautery was minimally applied. The conjunctiva was then anchored to the edge of the sclera using 8/0 silk suture, leaving the sclerectomy site bare. The eye operated upon was padded until the following day. Post-operatively, patients received Maxitrol ointment 3 times daily for 6 weeks. The patients were evaluated at 1 week, 6 weeks, 3 months, 6 months, one and two years post-operative period. Intra-operative, post-operative complications and recurrence rates were noted. A recurrence was defined as any regrowth or reinvasion of the cornea by vessels or pterygium tissue.

Result

Twenty three eyes of 17 patients with primary pterygium had excision by the bare sclera method with sclerectomy. All the pterygia were the vascular types. The extent varied from grade 2 to 3. All eyes had nasal pterygia except case 12 (see Table 1) who had double pterygia. Seven patients out of the 17 were females. The ages of all the patients ranged from 25 years to 77 years, with a mean age of 46.5 years. Sixteen patients were available for follow-up, the period which varied between 6 and 31 months. One patient (Case 16) was lost to follow-up.

at 2 months after surgery in the nasal and temporal positions. The patient who bled excessively intra-operatively had to be investigated for a bleeding disorder. The results of investigations were negative. Suture granuloma occurred in 2 eyes and one of the eyes developed a recurrence.

There were no other corneal, sclera complications noted neither were there anterior chamber reaction after several months of follow-up.

Discussion

There have been many surgical procedures suggested to eliminate recurrence in pterygium surgery. This proliferation of procedures is an indication that no procedure satisfies everyone.

The bare sclera technique is still a popular choice of many surgeons offering pterygium excision. Various modifications of this technique is accompanied by varying results, especially the recurrence rate. Randomised control trials by Mannig et al¹⁰ suggest that the use of mitomycin C reduces recurrence rate after pterygium excision, however, Mitomycin C when used as adjunct intra or post operatively gives complications like sclera melting.

The tendency for pterygium to recur has been an enigma for a long time. Various postulates have been suggested. Re-exposure to ultraviolet rays have been suggested and subjects have been advised to wear sunglasses after surgery¹¹.

Table 1 Series of cases of primary pterygium treated by bare sclera method and sclerectomy

No	Name	Age	Sex	Eye	Extent	Postop complication	Recurrence	Period of follow-up
1	TA	77	F	RE	GRADE 3	NIL	NO	25 MONTHS
2.	TA	36	F	BE	GRADE 2	NIL	NO	31 MONTHS
3.	OO	38	F	BE	GRADE 3	NIL	NO	30 MONTHS
4.	AA	37	M	LE	GRADE 3	NIL	NO	29 MONTHS
5.	PO	37	M	BE	GRADE 2	SUTURE GRANULOMA LE	NO	14 MONTHS
6.	AO	40	M	RE	GRADE 2	NIL	NO	14 MONTHS
7.	EI	50	F	RE	GRADE 2	NIL	NO	7 MONTHS
8.	NM	42	M	BE	GRADE 2	NIL	NO	11 MONTHS
9.	EC	42	F	RE	GRADE 2	NIL	NO	7 MONTHS
10.	AM	40	M	BE	GRADE 2	SUTURE GRANULOMA (L)	YES (LE) @ 3MONTHS NO (RE)	8 MONTHS 8 MONTHS
11.	AO	43	M	LE	GRADE 3	NIL INTRAOPERATIVE BLEEDING	NO YES @ 2 MONTHS	6 MONTHS
12.	BE	48	M	RE	3 DOUBLE	NIL	NO	12 MONTHS
13.	OB	52	M	RE	GRADE 2	NIL	NO	26 MONTHS
14.	AE	73	F	E	GRADE 3	NIL	NO	30 MONTHS
15.	AT	25	M	RE	GRADE 2	NIL	NO	Lost to follow up 1 week
16.	RA	67	M	LE	GRADE 3	?	?	30 MONTHS
17.	AB	44	F	LE	GRADE 3	NIL	NO	

RE = right eye

LE = left eye

BE = both eyes

Out of the 22 eyes of the 16 patients available for follow-up, recurrence occurred in 2 eyes of 2 patients making the recurrence rate 9.1%. This recurrence occurred within 2 months and 3 months after surgery respectively. One of the patients (Case 10) who had a recurrence in his left eye had developed a suture granuloma post-operatively, a recurrence was noticed at 3 months. In his right eye no recurrence occurred within the 8 months follow-up period. The second patient (Case 12) who had double pterygia removed bled excessively intra-operatively necessitating cautery. A recurrence was noticed

In spite of this recurrence still occurs. The type of pterygium in terms of its vascularity have been identified as a major factor. Recurrence is high in younger persons who tend to have fleshy or vascular pterygia¹² and less common in the older age group. It has been suggested that there may occur excessive inflammatory response post-operatively and perhaps this leads to the production of a factor that breaks down the barrier against regrowth of the fibro-vascular tissue¹². Hence the use of steroids, antimetabolites, B-irradiation in the intra and post-operative management of the subjects with

pterygium. These methods have not stopped completely recurrence of pterygium¹²⁻¹⁷.

Severe barrier function destruction has been thought to occur after repeated pterygium excision leading to fibrous tissue reinvasion³. Treatment of this situation aims at both suppression of the fibrous tissue and reconstruction of the distorted surface epithelium.

Various techniques using conjunctival transplantation, keratoplasty have been performed with useful results especially for recurrent pterygium^{8,11,18,19}, but they do not completely suppress sub-conjunctival re-growth of fibrous tissue.

Replacement of diseased conjunctiva with an autologous conjunctiva tissue from another site^{4,5,8} has recorded success but has not completely eliminated recurrence rate.

Merrill J. Reeh²⁰ had suggested the use of corneoscleral lamellar transplant for recurrent pterygium in order to restore to normal the architecture of the cornea which gets disrupted by an invading pterygium. He excised half thickness lamella of cornea and sclera and laid donor tissue on the site. No adequate series has tested this method.

In this series recurrence occurred in 2 eyes of 2 patients which is 9.1% and it is much lower than the 32.8% obtained by the same author several years ago² using the Bare Sclera method alone. One eye which developed a granuloma around a suture and another eye that had excessive cautery intra-operative had their pterygium recurred. Excessive post-operative inflammation could account for the recurrence in these eyes. The lack of recurrence in all the other subjects could not be due to the type of pterygia nor their ages since all the eyes had vascular and extensive growth, only 5 of the subjects were 50 years and above. Even these older patients had vascular progressive pterygia causing discomfort to the patients. A controlled clinical trial by Tan DT et al to compare bare sclera excision with conjunctival autograft showed that in recurrent cases the morphology of pterygium rather than age was a significant risk factor for recurrence in the 2 methods¹⁹.

It has been found that pterygium recurrence appears within 6 months of surgery^{4,5,6}. It is unlikely therefore that the eyes that were free from recurrence after 6 months of surgery in this series will develop one.

Removal of episclera and superficial sclera adjacent to the limbus could be the main factor responsible for the non-recurrence in this series.

The episclera tissue is a vascular loose connective tissue and elastic tissue which covers the sclera and anteriorly connects the conjunctiva to it. The superficial layers of episclera are continuous with the loose tissue of Tenon's space while its deeper layers become more and more dense and gradually give place to the sclera proper. The superficial layers of the sclera next to the episclera have less strong collagen fibres and are not as adherent to each other as the deeper layers²². Perhaps the removal of this superficial layer of sclera with the episclera removes with it the factor that provokes pterygium regrowth. There was no sclera transplanted in these eyes, neither were undue complications seen in any of the eyes followed-up for at least six months and up to thirty-one months.

Conclusion

Partial sclerectomy at the bed of pterygium when performed with the bare sclera method was accompanied by a recurrence rate of 9.1% which is much lower than previous reported values in the areas where prevalence of pterygium is high. The recurrence occurred only in the 2 eyes that had intra or post-operative complications. No recurrence was observed in 20 eyes out of 22 eyes followed-up for up to 31 months. Removal of superficial sclera with the episclera tissue may remove with it the factor responsible for recurrence of pterygium.

It appears that removal of the superficial layers of sclera may be a reasonable modification of previous methods which may lower the recurrence rate of pterygium excision while still performing the bare sclera method that many surgeons still choose to perform.

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