Original Article

A study of various surgical treatment modalities for the treatment of primary and recurrent pterygium at tertiary health care center

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Abstract

Introduction: Pterygium is a Greek word for wing. Pterygium is a wing shaped flesh growth of elastotic, degenerative conjunctive on corneal limbus. it is fibrovascularsubepithelial in growth of conjunctiva. **Aims and Objective:** To Study of various surgical treatment modalities for the treatment of primary and recurrent pterygium at tertiary health care center. **Material and Methodology:** In this study 51 eyes of patients with pterygium who underwent excision with conjunctival auto grafting in our institute in last 18 months were reviewed. Data is collected from operation theatre records. The conjunctival auto graft was harvested from the superotemporal conjunctive and secured with 10-0 ethilon. Five ophthalmologists with minimum 5 years of surgical experience were involved in the study. Risk factors for recurrence were evaluated with regard to individual surgeon variation, patient's demographic factors and pathology of the pterygium. **Result:** The most common age group was >60 i.e. 27.45% followed by 51-60- 25.49%; in 41-50. 21.56%; 31-40- 19.60%; <30- 5.88%.The majority of the Patients were Males i.e. 68.62% followed by Female i.e. 31.37% .The majority of the Patients were Unilateral - 88.23% and Bilateral were 11.76%. Recurrence rate was highest in recurrent type of pterygium i.e. 25 % and in Primary was 20%. Recurrence rate was highest in Fleshy i.e. 27.02% and in Atrophic was 7.14%.The most common postoperative complication was Steroid responders found in 2 cases followed by Granuloma formation, Conjunctival cyst formation, Symblepharon formation, Sclera thinning in recurrent pterygium was found in 1 case. **Conclusion:** Ideal pterygium surgery should achieved 3 principle goals viz. low recurrence rate, absence of complication and satisfactory cosmoses. Conjunctivalautogarfting has definite lower recurrence rate as compared with recurrence rates of other procedure published in litereature. Procedure is safe with low complication rate. Wide inter surgeon variation is observed with this procedure .surgeons who had performed more conjunctivalautografts for pterygium before the study were found to have a lower recurrence rate, suggesting a learning curve effects.

Keywords: Pterygium, Conjunctivalautografting, Granuloma formation, Conjunctival cyst formation, Symblepharon formation.

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INTRODUCTION

Pterygium is a Greek word for wing. Pterygium is a wing shaped flesh growth of elastic, degenerative conjunctive on corneal limbus. it is fibro vascularsub epithelial ingrowth of conjunctiva.[1,3] Many different treatment modalities have been devised, but none is perfect and the search for better continues. The treatment has evolved through many phases.Conjunctivalautografting for a pterygiumis perceived to be a safe and effective procedure and is considered to be the procedure of choice by many surgeons. Pterygium, a wing shaped encroachment of bulbar conjunctiva on to the cornea, was recognised by Hippocrates, galen and celsus hundreds of years ago.[1] The pathology of pterygium was initially studied by winther (1856).[1] many different theories have

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been put forth to explain etiopathogenesis of pterygium formation. Von arlt (1845)[1] supported inflammatory basis, and put forth the fact like presence of fibrous tissue, round cells, infiltration favoring this theory. Winther (1856)[1] suggested the neoplastic etiology for the pterygium. Mannhurdt (1876)[1] suggested an association with corneal ulcer and episcleritie and episcleritis and supported the inflammatory theory. Poncet (1881)[1] concluded that pterygium is associated with the dry, sunny climatic condition as he observed that pterygium is common in hot, dusty and sunny regions. Treigny and coitre (1933)[1] and Anderson and Cameron (1954)[1] supported the climatic condition theory. Hilgers (1960)[1] suggested the allergic basis due to presence of lymphocytec and plasma cells in stroma of pterygium. Sapuppo (1953) theorized that the pterygium occurs due to neurotropic condition of conjunctiva as it shows reaction to irritants. Pinkerton (1965) showed that hypersensitivity may contribute to pathogenesis of pterygium. Localization of Ig G and Ig E in pterygium tissue suggests that immunological basis. Gram (1954)[1] observed that decrease in lacrimal secretions may be one of the etiology of pterygium. Cameron (1964)[1] suggested an association with ultraviolet and infrared radiation from sunlight as it is a condition found chiefly in sunny, hot, dusty regions of the world. Hechshotagh (1990)[1] observed that genetic and familial factors are responsible for pterygium. In early days medical treatment has been tried out for pterygium with unsatisfactory result. Beard anddinitry (1945) tried to treat pterygium with application of Naci. Vadola (1953)[1] used topical steroids to relieve the symptoms. Anastasu (1953)[1] used subconjunctival injection of hyaluronidase in treatment of pterygium .Von arit (1850)[1] exercised pterygium excision with simple closure of bare sclera by suturing conjunctival margins. Boekman (1897) and D'ombrain (1948)[6] used bare sclera technique i.e. after excision sclera is left uncovered and allowed to heal by granulation. Desmarres (1851)[1] and mcreynoids (1902)[1] used the method of translocation of head lower bulbar conjunctiva. Nehar (1939)[1]translocated the head beneath upper bulbar conjunctiva. Knapp (1868)[1] split the pterygium and buried half above and below. Rolen (1948)[1] dissected the head and folded it back on itself to stop further growth. Conjunctivalautograft for pterygium was adapted from thoft's (1977)[3] use of conjunctival transplantation for chemical burns. Published recurrence rates of pterygium after excision with conjunctivalautograft have ranged widely from 21-35% lewallen reported no statistically significant difference in recurrence rates after bare sclera excision with or without autograft. Age has been found to be an important factor in recurrence after conjunctivalautografting, according to lewallen.[6] Conjunctivalautografting was studied for 29 years by simona and 38 years by leuenberger.[6] Kenyon and starck (1991)[8] have reported that complication involving conjunctivalautograft tend to be less severe and rarely sight threatening. Symblepharon formation and risk of muscle disinsertion are serious one. Kunitomoandmori[9] (1963) first used miltomycin-c in 1992 rubinfield, stein and fosler reported serious complications of topical mitomycin-c[10] .p.p.chen (1965) in his study concluded that conjunctivalautograft is as effective as low dose of mitomycin-C (0.2 mg/ml twice a day for 5 days)[7] hayasaka demonstrated the efficacy and safety of lower dose (0.02% bd for 5 days)[11] Argon laser mode of treatment is a relatively newer concept but slowly getting popular. Caldwell first reported high success rates in primary pterygium[10]. Saifuddinshabbir reported 92.8% success rates in recurrent pterygia after single excision and success rate of 64.2% after 2-3 excisions[12].

MATERIAL AND METHODS

In this study 51 eyes of patients with pterygium who underwent excision with conjunctivalautografting in our institute in last 18 months were reviewed. Data is collected from operation theatre records. Complete ocular and haematological examination has been done for each patient. Patients were selected for the conjunctivalautografting on following criteria: Both primary and recurrent pterygia, Both atrophic and fleshy pterygia. Patients with progressive pterygium invading more than 2 mm of cornea. Surgical outcome of 35 years with primary pterygium and 16 eyes with recurrent pterygium were reviewed. The conjunctivalautograft was harvested from the superotemporal conjunctive and secured with 10-0 ethilon. Post operative local antibiotic and steroid eye drops were given for 4 to 6 weeks in tapering doses. patients were reviewed on day 1, 3 and 7 for postoperative complication and two monthly thereafter for recurrence. The recurrence was defined as regrowth of pterygium onto the surgical limbus. Five ophthalmologists with minimum 5 years of surgical experience were involved in the study. Risk factors for recurrence were evaluated with regard to individual surgeon variation, patient's demographic factors and pathology of the pterygium.

RESULT

Table 1: Age distribution of patients

Age(years)	No of patients
<30	3(5.88%)
31-40	10(19.60%)
41-50	11(21.56%)
51-60	13(25.49%)
>60	14(27.45%)

The most common age group was >60 i.e. 27.45% followed by 51-60- 25.49%; in 41-5021.56%; 31-40- 19.60%; <30- 5.88%.

Table 2: Incidence of disease according to sex

Sex	No. Patients (%)
Males	35(68.62%)
Female	16(31.37%)

The majority of the Patients were Males i.e. 68.62% followed by Female i.e. 31.37%.

Table 3: Laterality of pterygium

Laterality	No. Patients (%)
Unilateral	45(88.23%)
Bilateral	6(11.76%)

The majority of the Patients were Unilateral - 88.23% and Bilateral were 11.76%.

Table 4: Recurrence rate in primary and recurrent pterygia

Type of pterygium	No of cases	Cases recurred	% recurred
Primary	35	7	20
Recurrent	16	4	25

Recurrence rate was highest in recurrent type of pterygium i.e. 25 % and in Primary was 20%.

Table 5: Recurrence rate in fleshy and atrophic pterygia

Type of pterygium	No of cases	Cases recurred	% recurred
Fleshy	37	10	27.02
Atrophic	14	1	7.14

Recurrence rate was highest in Fleshy i.e. 27.02% and in Atrophic was 7.14%.

Table 6: Postoperative complication

Complications	No of cases
Granuloma	1
Conjunctival cyst	1
Symblepharon	1
Steroid responders	2
Sclera thinning in recurrent pterygium	1

The most common postoperative complication was Steroid responders found in 2 cases followed by Granuloma formation, Conjunctival cyst formation, Symblepharonformation, Sclera thinning in recurrent pterygium was found in 1 case.

DISCUSSION

Various theories have been put forth to explain the cause of pterygium, though exact pathogenesis is still unknown. Ultraviolet theory (Moran)[14] : Pterygium is found commonly in sunny, hot and dusty regions of the world, between latitude 37 degrees north and south(Cameron)[2] moron proposed that it is because of a type of burn produced over several years by cumulative absorption of infrared and ultraviolet radiations from the sun. The anatomical location in intra-palpebral region also implicates the environmental factors. Any glass, especially crook's glass absorbs long infrared and short ultraviolet rays and minimizes the effect of these rays. Hence it is rare to see pterygium in person who constantly wears spectacles. Immunological theory (pinketon 1984) : Hypersensitivity may contribute to pathogenesis of pterygium. The presence of lymphocytes and plasma cells in stroma of pterygium tissues indicates that immunological process may be involved. Ig G and Ig E antibodies are commonly seen in pterygium. The presence of Ig E suggests possible involvement of type I hypersensitivity reaction. Inflammatory theory (Von Arit)[1] : Von arit supported inflammatory basis of pterygium formation, starting with corneal ulcer, episcleritis and trachoma. Facts favouring this theory are presence of fibrous tissue, round cells, infiltration of superficial strata and marked increase in goblet cell vascularity. Neoplastic theory(Winther)[1] : Winther and von hasner suggested the possible neoplstic origin of pterygium. This theory has been questioned because pterygium extends only in one direction and that too towards a vascular area i.e. cornea. Zehender'stheory[1] : According to zehende, pterygium represents encroachment of pinguecula upon the cornea. Other treatment modalities: Early pterygiumproducting symptoms like itching, redness watering is treated with topical mild steroids, vasoconstrictors and preservative free lubricants, avoiding exposure to dry, dusty weather usually helps to alleviate the symptoms. Use of ultravioulet blocking spectacies can prevent further progression. Surgical treatment: Avulsion **:**Avulsion was practiced by Greeks in 18th century. Pterygium is removed and sclera is left bare for epithelisation. Excision with primary closure-von arit (1850)[1]**:** Pterygium is excised and the defect is closed by undermining normal conjunctiva. McReynold's transplantation of head of pterygium[1]**:** Head of the pterygium is dissected from cornea and transplanted under conjunctiva away from limbus. Mitomycin C: Mitomycin C is used as an adjunctive to pterygium excision to prevent recurrence. Pterygium is excised and 0.01% of mitomycin-C is applied at the bare sclera with the help of sponge for 5 min. thereafter patients are given mitomycin C as 0.02% solution mixed with antibiotic steroid combination eye drop and instructed to put these drops twice a day for 5 days. Plain, lacrimation, recurrent epithelial defects, corneal ulcer, sclera necrosis, secondary glaucoma and cataract are common complication seen with this therapy. Radiations: Beta rays act by inhibition of mitosis in rapidly dividing vascular endothelial cells, the isotope strontium 90 is used in ophthalmic practice. It is produced by fission of U-235. Half life of strontium 90 is 28 years. The dose is between 1000-3000 Gy given at time of surgery or within few days. Shiro amino reported 23%

recurrence rate in primary pterygia with this technique[15]. Corneal thinning, ulceration, symblepharon and cataract formation are common complication observed. Thiotepa: Thiotepa is introduced by mecham in 1962[16] . It is an alkylating agent with active antimitotic properties produced from extract of nitrogen mustard. It acts against proliferating vascular epithelium. It is used in 1:2000 concentration (15 mg in 30 ml of RL) 6 hourly for 6 wk. allergy, kerating and eyelid depigmentation are common complication observed with the use of thiotepa Pterygium is elasticfibro vascular degenerative growth of conjunctiva on cornea. The disease is very common in tropical regions including Indian subcontinent. Environmental factors like dust and ultraviolet radiation are thought to play a major role in pathogenesis of pterygium. In this study 51 eyes with primary (35) and recurrent (16) pterygia are treated with conjunctivalauto grafting. 74% of patients are above 40 years of age, showing more common occurrence in working population. A male preponderances is also observed in the study (35 male vs. 16 females), possibly due to more common outdoor occupation in male patients. 49.01% of the patients are farmers or vendors who are constantly exposed to the dry, dusty weather and sunlight. Pathogenesis of the pterygium has been extensively discussed by schoninger, herumet and duke Elder[1]. It is a progressive process starting with defect in the bownmens membrane probably by environmental factors. The disease slowly progresses to fibroelastic degeneration and corneal invasion.Unilateral pterygium (88.24%) is more common than bilateral. if given sufficient time and exposure, both the eyes can developed the disease. Avoidance of the exposure to dry weather and sunlight is necessary to prevent the occurrence of the disease in other eyes. Nasal pterygium is observed to be more common (92.15%) than temporal. This is probably due to internal reflection of ultraviolet rays at nasal bridge causing higher radiation to nasal limbus. Treatment of the pterygium has evolved extensively over past few decades. Medical treatment in the form of local NaCl, steroid injection and hyaluronidase has been used in the past with unsatisfactory results. Surgical excision is found necessary for control of the disease. The resultant defect after surgical excision is addressed differently by many surgeons. Bare sclera method, though practiced since greek era, is generally found unsatisfactory due to high recurrence rate (30-70%). In bare sclera technique it was theorized that a pterygium recurrence would be prevented if the corneal epithelium could heal before the conjunctival epithelium reaches the limbus[5]. Adjunctive treatment after bare sclera excision with B irradiation reduced recurrence rates to as low 0-5%-16% secondary glaucoma, corneal oedema, iritsi corneal peforation, endophthalmitis and cataract. In 1985 kenyon et al[8] documented a recurrence rate of 5.3% in primary pterygium after conjunctival autographing. He proposed that, close approximation of healthy conjunctival tissue at the denuded limbus after pterygium excision prevents recurrence. The results has been confirmed by lewallen[6] and other surgeons in different studies. Riordan eva et al quoted a probability of recurrence of 14% with this procedure at 36 months after surgery.

CONCLUSION

Ideal pterygium surgery should achieved 3 principle goals viz. low recurrence rate, absence of complication and satisfactory cosmoses. Conjunctivalautogarfting has definite lower recurrence rate as compared with recurrence rates of other procedure published in litereature. Procedure is safe with low complication rate. Wide intersurgeon variation is observed with this procedure .surgeons who had performed more conjunctivalautografts for pterygium before the study were found to have a lower recurrence rate, suggesting a learning curve effects.

REFERENCES

1. Duke-Elder-Diseases of outer eye 195,8:573-585
2. Chenpp, Arjyas RG, ksza V, labree LD, Mc Donnell Pj, A randomized trial comparing mitomycin-c and conjunctivalautograft after excision of primary pterygium. Amercan journal of ophthalmology 1995, 120: ISI-160
3. Jack. Jkanski 2003, 4 82-83.
4. Pinketon OD Hjokama y shigemura La immunologic basis for the pathogenesis of pterygium 1984,98 225-228
5. D'ombrainA -surgical treatment of pterygiumbritishjouucal of ophthalmology 1948, 32: 65-71
6. Lawallen SA- Randomized trial ofcojunctivalautografting for pterygium in tropics 1989,96: 1612-160
7. Simona F, tebatabaus LA Leuenberger pm. Resultants preliminaries at 1 a technique d' excision du pterygiumave 1990, 196:295-97.
8. Stark T, Kenyon KR, sertanor-conjunctivalautografting in primary and recurrent pterygium , surgical technique and problem management cornes 1991,10: 196-202
9. kunitomo N, Mori S.studies on pterygium. A treatment of pterygium by mitomycin C instillation.Actasoc of ophthalmology-Japan, 67:601-607
10. Rubinfield R S, Stein R M, Foster C S. serious complication of topical mitomycin c after pterygium surgery. Ophthalmology 1992,99:1647-1654
11. Hayasaka s, noda s, yamamoto y, setogava t, post-operative instillation of low dose mitomycin c in treatment of primary pterygium. AJO 1989, 107:571
12. Saifuddin s vaum KL recurrent pterygia- laser therapy-a preliminary report IJO 1993, 41: 17-19
13. Moran DJ ollows FC, pterygium and irradiation. A positive correlation brithsh journal of ophthalm 1984, 68:343-346.

14. Steve EW Bourne WM, conjunctival z plasty in treatment of pterygium-American journal of ophthaim 1988, 106: 355-357
15. Amanos, motoyam y, oshika T, eguchi S, eguchi K comparative study of intraoperativemitomycin c and B eradiation in pterygium surgery BJO 2000,3: 618-621.
16. Liddy BR, Morgan JF-thiotepa and pterygium AJO 1966, 61:886.

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