AMNIOTIC MEMBRANE TRANSPLANTATION IN THE TREATMENT OF SHIELD ULCER IN VERNAL KERATOCONJUNCTIVITIS.

AFZAL QADIR¹, LAL MOHAMMAD², ARSHAD IQBAL³, ASHFAQ UR REHMAN²

1. Department of Ophthalmology, Hayatabad Medical Complex Peshawar

2. Kohat Medical College, Kohat

3. Department of Ophthalmology, Saidu Teaching Hospital, Saidu Sharif Swat.

ABSTRACT

Objectives: To evaluate the efficacy and safety of amniotic membrane transplantation (AMT) for the treatment of shield ulcer in vernal keratoconjunctivitis (VKC) with giant papillae.

Material and Methods: This retrospective study was conducted in the Department of ophthalmology Hayatabad Medical Complex Peshawar from May 2009 to May 2010. In this study 30 patients of VKC with shield ulcer were evaluated for a period of one year. Both gender of 3 - 26 years age patients were included in this study. Patients were enrolled and informed written consent was taken. Amniotic membrane implantation was performed in thirty patients with grade 2 or grade 3 shield ulcers unresponsive to conventional medical treatment lasting an average of 14 weeks. Surgery was done under general anesthesia using amniotic membrane as a therapeutic contact lens. Their record was maintained and all patients with the mean 4 months follow-up were evaluated for about safety, efficacy, and side effect of the treatment.

Results: Thirty eyes of thirty patients with grade 2 shield ulcer with opaque base) and grade 3 (plaque like lesions) not responding to steroid therapy with or without surgical debridement were enrolled. The ulcers healed with disintegration or retraction of the membrane in all patients within 2 weeks. A significant decrease in symptoms and complete reepithelialization of the corneal ulcers were observed in all cases within the first 7 days. The eyes remain stable during a mean follow-up of 4 months, with no intraoperative or postoperative complications. Absorption of amniotic membrane occurred within 2 to 3 weeks time leaving the underlying ulcer completely epithelized.

Conclusion: Amniotic membrane transplantation in combination with debridement is a safe and effective surgical modality in the management of shield ulcers. Further studies are warranted to confirm the efficacy of amniotic membrane transplantation in the management of shield ulcer.

Key words: Amniotic membrane transplantation shield ulcer- giant papillae - vernal keratoconjunctivitis

INTRODUCTION

Vernal Keratoconjunctivitis (VKC) is a chronic, recurrent, often severe, bilateral external ocular allergic disease that affects primarily children and young adults. 80% cases of VKC are younger than 14 years of age. Boys are affected more than girls. As the disease exacerbates during spring season, it is also known as spring catarrh. The incidence is more in dry and hot environments such as South Africa, Mediterranean countries and India, Pakistan and central and South America. VKC presents with intense itching of eyes, tearing, photophobia, mucus discharge, foreign body sensation in the eyes¹. Shield ulcer is an

uncommon, incapacitating corneal manifestation that occurs in 3 to 11% of patients suffering from Vernal keratoconjunctivitis². To prevent the vision threatening complications of shield ulcer, it should be treated aggressively and appropriately. Treatment of shield ulcer may vary from topical medication to surgical intervention, depending on the grade of ulcer. Removal of plaque and scrapping of base hasten the re-epithelialization of drug resistant shield ulcer.

MATERIAL AND METHODS

This retrospective study was conducted over a period of one year from May 2009 to May 2010.

Thirty patients were selected from the department of Khyber Institute of Ophthalmic Medical Sciences (KIOMS), Hayatabad Medical Complex, Hayatabad, Peshawar. 30 patients of VKC with grade 2 and grade 3 shield ulcer were admitted for surgical debriment of the ulcer and amniotic membrane transplantation under local or general anesthesia depends upon the age and cooperation of the patient. Informed verbal and documented consent was taken from all cases in adults and from parents in cases of children before enlisting them in the study. Detailed history of all cases was taken. Visual acuity, fluorescein staining of the shield ulcer, measurement in vertical, horizontal and in large dimension of the ulcer. Anterior chamber examination, lens, and fundus examination with 90D with possible visibility. The eyelids were everted to look for papillae and grade it. All cases were subjected to general systemic examination and detailed ocular examination to rule out other allergic systemic and ocular diseases. Cases that did not fit for the diagnostic criteria of VKC were excluded. Other forms of allergic conjunctivitis except VKC and other external eye diseases were excluded.

Grading of shield ulcer:

Grade 1 = shield ulcer with a clear base; these have a favorable outcome and re epithelization with mild scarring;

Grade 2 = ulcers with visible inflammatory debris at the base; such ulcers are prone to complications and exhibit delayed re-epithelization and a poor response to medical therapy;

Grade 3 = shield ulcers with elevated plaques.

Papillae were graded on a 0 to 4 scale:

A grade 0 indicates no papillae are present.

A grade 1 indicates a few widespread papillae less than 0.3 mm in diameter on the palpebral conjunctiva or on the limbus.

Grade 2 designates tarsal or limbal papillae between 0.3 and 1.0 mm in diameter.

Grade 3 papillae are between 1.0 and 3.0 mm in diameter.

Grade 4 papillae are greater than 3.0 mm in diameter. A gelatinous limbal appearance of the peripheral cornea would also be considered a sign of grade 4.

RESULTS

The total number of cases included in the study was 30. Age of patients ranged from 3 years to 26 years old. Maximum numbers of patients were in age group 6-10yrs old (36.6%) followed by age group 11-16 years old (33.33%) shown in table I. twenty-four cases were males and six cases were female out of the thirty included cases. 88.2% were students. The ulcers healed with disintegration or retraction of the membrane in all patients within 2 weeks. A significant decrease in symptoms and complete reepithelialization of the corneal ulcers were observed in all cases within the first 7 days. The eyes remain stable during a mean follow-up of 4 months, with no intraoperative or postoperative complications. Absorption of amniotic membrane occurred with in 2 to 3 weeks time leaving the underlying ulcer completely epithelized. Preoperative visual acuity light perception (LP) to hand movement (HM) in 15 (50%) of cases. While patients with counting fingers close to eye to less than 3/60 were 08 (26.66%). shown in table II. Postoperative visual acuity improved to 6/60 to 6/18 in 15 (50%) of cases. Counting fingers to less than 6/60 in 08 (26.66%) of patients shown in table II. All cases had grade 3 or grade 4 papillae. And all patients had grade 2 or grade 3 shield ulcer. The ulcer was measured from 2x5 to 7x7mm. And most of the ulcers were superonasal. The commonest symptom was itching (100%) followed by redness of eyes, photophobia and discharge.

Gender distribution

Table I: Age distribution in a patient of shield ulcer: (N-30)

Age group in years	Number of Patient (%)
3 - 5	02 (6.66%)
6 - 10	11 (36.66%)
11 - 16	10 (33.33%)
17 - 26	07 (23.33%)
Total	30

Table II: Preoperative and post-operative Visual Acuity (N 30)

# of Patients	Preoperative V/A	Postoperative V/A
15 (50%)	LP - HM	6/60 - 6/18
08 (26.66%)	CF - <3/60	CF - 6/60
07 (23.33%)	3/60 - 6/60	Better than 6/18

V/A: Visual Acuity.

LP: Light Perception.

HM: Hand Movement.

<: less than.

DISCUSSION

VKC is a chronic seasonally exacerbated allergic inflammation of the ocular surface involving the tarsal or bulbar conjunctiva². VKC is not a blinding disease, but visual impairment is not uncommon if the cornea is involved. Although punctate epitheliopathy is the commonest, shield ulcer with or without plaque, keratoconus, hydrops, pseudogerontoxon and corneal opacification, are not uncommon manifestations of corneal involvement in VKC³. Coalescence of punctate erosion may lead to a large epithelial defect known as shield ulcer. In the event of inappropriate or no treatment, a plaque containing fibrin and mucus deposits on this epithelial defect which hampers the re-epithelialization of shield ulcer⁴. In the treatment of shield ulcer, topical antihistamines, dual action drugs, lubricants and corticosteroids are the first line of defence. Supratarsal corticosteroid injections,⁵ topical cyclosporine 0.05%- 2%,⁶ cryotherapy, surgical or laser⁷ assisted excision of giant papillae with⁸ or without mitomycin, excimer laser phototherapeutic keratectomy,⁹ amniotic membrane graft¹⁰ and cultivated corneal epithelial cells transplant,¹¹ have been tried for nonhealing shield ulcer with varying degrees of success. Refractory shield ulcers may

progress to visual threatening complications such as infective keratitis, corneal opacity, perforation, strabismus and amblyopia, and should be treated appropriately and aggressively. Based on their clinical characteristics, response to treatment and complications, shield ulcers can be classified into three grades¹². Shield ulcers with a clear base (Grade 1) have a favourable outcome and re-epithelialize with mild scarring on medical treatment. Ulcers with visible inflammatory debris in the base (Grade 2) exhibit poor response to medical therapy. Because of delayed reepithelialization shield ulcers may develop infective keratitis. Grade 2 shield ulcers, unresponsive to combined therapy with topical corticosteroids, Olopatadine and lubricating eye drops heal rapidly after adding commercially available preparations of topical cyclosporine¹³. Shield ulcers with elevated plaque (Grade3) need surgical intervention¹⁴. On histopathological examination, plaques are found to have granular and deeply esinophilic lamellar material attached to the Bowman layer. Immunohistochemistry confirmed this lamellar material to be esinophil derived major basic protein (MBP), which possesses cytotoxic properties, and is probably responsible for the delayed ulcer healing. The Shield ulcer in these patients exhibited all three stages of evolvement of shield ulcer which re-epithelialized rapidly after removal of plaque and scraping of ulcer base and amniotic membrane transplantation as compare to Solomon A et al¹⁵.

CONCLUSION

Amniotic membrane transplantation in combination with debridement is a safe and effective surgical modality in the management of shield ulcers. Further studies are warranted to confirm the efficacy of amniotic membrane transplantation in the management of shield ulcer.

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For Correspondence:

Dr. Afzal Qadir,
Eye Surgeon,
Hayatabad Medical Complex,
Peshawar.
Cell: 0321-9128247