ORIGINAL PROF-626

ROLE OF CONJUNCTIVAL FLAP OPERATION IN FUNGAL KERATITIS

COL. (DR.) MUHAMMAD WASEEM
FCPS. (OPHTH.)
Head of Eye Department,
C.M.H. Peshawar Cantt.

MAJOR (DR.) FAKHAR HUMAYUN,
M.B.B.S
Eye Deparment, C.M.H
Multan Cantt.

ABSTRACT

The management of recalcitrant fungal keratitis often poses great therapeutic difficulties. In this regard, a study was conducted to emphasize upon the importance of conjunctival flap operation in cases of fungal keratitis not responding to topical and systemic anti-fungal agents and to assess improvement in these patients. Twenty-five patients with fungal keratitis were selected and conjunctival flap operation was performed between July 1999-August 2000. Nineteen were male and six were female patients. Patients' age was between 8-60 years. Excellent results were obtained by this method in selected cases of fungal keratitis. Pain in the eye subsided in all patients. Marked improvement also occurred in corneal inflammation, hypopyon and associated uveitis. Triggering factors were trauma (60%), topical steroids (20%), use of antibiotics (46%), diabetes and chronic ill health (24%), males were 76% and females were 24%. The type of procedure included advancement flap (32%), single pedicle (32%), bipedicle (16%) and total flap (20%). Complications included upward retraction of flap in 2 cases and buttonhole formation in 2 cases. The purpose of this study is to highlight the importance of conjunctival flap operation in cases of selected fungal corneal ulcers. More work is suggested to improve upon the efficacy and results of this procedure.

KEYWORDS: Conjunctival flap, fungal keratitis.

INTRODUCTION

Corneal ulcers are frequently encountered by ophthalmologists and their prompt management is important to restore vision and integrity of eye of the patients. During the past two decades, there has been increase in awareness and recognition of clinical signs of fungal keratitis, which accounts for approximately 15% of all cases stromal microbial keratitis. But it is still a challenge regarding their diagnosis and management. This is because of the tendency to mimic other types of corneal stromal inflammations, inadvertent use of steroids, difficulties in laboratory diagnosis, poor correlation of culture and sensitivity of such fungal isolates and, if diagnosed correctly, poor efficacy of topical and systemic anti-fungal treatment. Poor results of anti-fungal treatment are also due to increased cost of these medicines, poor availability in the market and poor penetration of these medications into the corneal tissue[1,2]. In such circumstances, conjunctival flap operations have been performed which provide humoral and cellular immunity to limit the infection[3,4].

The conjunctival flaps have been used for over hundred years. German publications dating back to 1870s and 1890s describe the first such technique. In 1958, Gunderson described a technique using conjunctiva without tenon's capsule as a flap for a number of applications. The main goals of this surgery are to control the infection and maintain the integrity of the globe [2].

MATERIALS & METHODS

The subjects included in this study were the serving and the retired personnel of the armed forces, their parents and their children. The study period ranged between July 1999 to August 2000. Both male and female subjects were part of the study. Cases of fungal keratitis were diagnosed by diagnostic criteria that included: clinical features compatible with fungal keratitis, fungal elements seen on stained smears of corneal scrapings and growth of fungal organisms on culture media (sabouraud's agar plates and / or brain heart infusion) with scrapings from involved cornea. Clinical features specific to fungal keratitis included an infiltrate with feathery margins, rough texture, raised borders, brown pigmentation, associated endothelial plaque and satellite lesions, apart from the general features of corneal ulcers like photophobia, decrease in vision, conjunctival injection, epithelial defects, suppuration, anterior chamber reaction and hypopyon.

A thorough history was taken which included date of onset of symptoms, history of trauma, prolonged use of topical antibiotics /steroids and response to the topical anti-fungals (if used already) were also noted. The examination included recording of visual acuity, slit lamp examination with particular reference to skin of eyelids for dermatomycosis, sign of conjunctival inflammation, corneal involvement for corneal sensitivity, shape of ulcer, area of cornea involved, presence or absence of necrosis and suppuration, colour of ulcer, margins and depth of ulcer, Descemetocele formation, presence of delicate feathery finger like infiltrate and hypopyon[5]. The lens and vitreous examination was also done when possible. Estimation of intraocular pressure by digital method and fundus examination with indirect ophthalmoscope was also attempted if media permitted. Laboratory investigations included sending of corneal scrapings for Gram's staining, Giemsa staining, lactophenol staining and potassium hydro-oxide preparation and culture on Sabouraud's agar plates[6,7].

The cases that did not show clinical picture of fungal keratitis were excluded from the study. Those cases that responded to medical treatment were also excluded from the study[8]. In this manner, a total number of 25 patients of fungal keratitis were selected and conjunctival flap operations were performed. Twenty-four operations were done under local anesthesia and one was done under general anaesthesia. The technique for each type of flap varied slightly according to the extent and location of the ulcers. These included advancement flaps, pedicle type and total type. However, general principles of conjunctival flap operation were applied to all[9,10,11,12].

In this , the corneal epithelium as well as necrotic tissue from the involved area was removed. Conjunctival peritomy was performed according to the type of conjunctival flap being performed. Conjunctival flap was meticulously dissected and all underlined tissue was separated so that a thin flap was obtained. A relaxing incision in the conjunctiva was made in the event of excess tension over it; the flap was smoothed and closed over its entire involved cornea and stitched with $8/_0$ silk sutures. Antibiotics and cycloplegic drops were applied; sutures were removed after 3 weeks. They were followed for their prognosis. They were advised to have regular follow up after every two weeks, after being discharged from the hospital.

RESULTS

The results so obtained have been summarized in table No.1 to7. From these findings, it is obvious that the age limits of these patients were between 8-60 years. Nineteen (76%) were males and six (24%) were females.

The greater number of male patients may be because of outdoor activity and that is why they were more prone to get trauma. Maximum numbers of cases in our study were farmers and were more prone to trauma by vegetable matters. Pain, lachrymation, photophobia and redness were present in all (100%) of the patients. Majority (64%) patients had already used antibiotics and steroids. Hypopyon was present in 10 (40%) patients.

However, it may be mentioned that activity in anterior chamber could not be assessed due to marked corneal haze. Intraocular pressure was raised in 15 (60%) patients. Two (8%) patients had Descemetocele and 2 (8%) patients had Endophthalmitis. Laboratory finding showed fungal isolates of aspergillus, fusarium, candida and mucor. The conjunctival flaps were advancement type (32%), single pedicle type (32%) and total type (20%).

Table-I. Age Distribution

Age (yrs)	No. of Pts.	%age
0-10	01	4%

11-20	01	4%
21-30	04	16%
31-40	10	40%
41-50	08	32%
51-60	01	4%
Total	25	100%

Table-II. Triggering Factors

Factor	No. of Cases	%age
Trauma	15	60%
Topical use of corticosteriods	05	20%
Trachoma	02	08%
Topical use of antibiotics	04	16%
Chronic ill health	04	16%
Diabetes Mellitus	02	08%
Swimming	02	08%

*Few patients had more than one triggering factors as a predisposing cause of fungal keratitis.

Excellent results were obtained from conjunctival flap operation. Pain in the eye subsided in all (100%) patients in 1 to 2 days post-operatively. Pain was caused by exposure of rich network of nerve fibres with bare ends, which subsided by covering it with conjunctiva which has only a few pain fibers causing only a minimal discomfort.

Table-III. Sex Distribution

Sex	No. of Pts.	%age
Male	19	76%
Female	06	24%
Total Cases	25	100%

Table-IV. Ocular Symptoms

Symptoms	No. of Pts.	%age
Redness of eye	25	100%
Watering of eye	25	100%
Photophobia	25	100%
Diminished Vision	22	88%
Pain	25	100%
Foreign Body Sensation	15	60%
Ocular Discomfort	10	40%

Once or more symptoms may be present in one particular patient.

Table-V. Topical Medications already used by the patients.

Name of Topical Medications	No. of Cases	%age
Antibiotics	12	48%
Steroids	04	16%
Anti-Virals	02	08%
Herbal Preparations	02	08%
Unknown	02	08%

*Few patients have used combination of above medications.

However, two patients developed pain after 3 weeks because of development of mild endophthalmitis that was treated by systemic anti-fungal treatment (mainly with oral Fluconazole)[13].

Hypopyon also subsided in all patients with passage of time. Visual acuity was 6/24 in 10 (40%) and 6/60 in 11 (44%) subjects that were expected to improve further with the passage of time.

Table-VI. Complications

Complications	No. of Complications	%age
Descemetocele	02	08%
Endophthalmitis	02	08%
Total	04	16%

This was attributed to clearing of conjunctiva, cornea and anterior chamber. Complications included upward

retraction of flap in 2 (8%) cases (treated by bringing down the conjunctiva again) and buttonhole formation in 2 (8%) cases (defect repaired surgically).

DISCUSSION

Fungal keratitis usually presents many difficulties to the ophthalmologists diagnosis and management. The medical treatment usually fails in approximately one third of cases, so one has to resort to surgical modality[8]. We found highly encouraging and successful results in these 25 patients.

We have been able to achieve a relief of pain in the eye in all patients within 1 to 2 days that otherwise would have been almost impossible. We have also been able to achieve prevention of impending corneal perforation and hence to save the eyeball from complete disruption.

Since Gunderson's report of application of thin conjunctival flap, the frequency of therapeutic keratoplasty has been significantly decreased[14]. Upward retraction and buttonhole formation results in ineffective control of keratitis /ulcer and repeat procedure or repair of flaps is required.

Conjunctival flaps are certainly underused and should be considered for different types of recalcitrant keratitis and non-healing epithelial defects and keratopathies[15,16,17]. Though our sample of patients was small, yet encouraging results would prompt us and the readers to adopt this procedure in future.

CONCLUSION

Conjunctival flap operation is recommended in all cases of non-healing corneal ulcers. It controls pain, heals the ulcer and saves the impending corneal perforation. The conjunctival flap is easy to make and is not associated with many complications. It is also foreseen that successful keratoplasty in the eyes that have previously undergone conjunctival flap surgery is possible (once inflammation subsides) to restore vision in grossly affected eyes. Other possible refinements to the technique may serve to further enhance the usefulness of conjunctival flap.

REFERENCES

1. Smolin G, Thoft AR. Conjunctival and Limbal Surgery for Corneal Diseases: The Cornea 3rd ed. 1994:239.

2. Krachmer, Mannis, Holland. Conjunctival Flaps: Surgery of the Cornea and Conjunctiva Vol. III 1997:1903-9.

3. Brightbill SF. Special Situations in Keratoplasty. Corneal Surgery Theory, Technique and Tissue: 2nd ed. 1993:246-7

4. Waltman R. Stephen, Keates H. Richard, Hoyt S. Creg, Fruch R. Bartley. Conjunctival Flaps and Pterygium: Surgery of Eye Vol. I 1988:263-70

5. Kanski JJ: Disorders of the Cornea and Sclera. Clinical Ophthalmology:4th ed. 1999:105.

6. Deshpande SD, Koppikar GV. A study of mycotic keratitis in Mumbai: Indian J Pathol Microbiol 1999 January: 42(1):81-7.

7. Legais JM, Blanc V, Basset D, D Hermeis F, Harrabi S, Frau E et al. Severe Keratomycosis : Diagnosis and treatment:J Fr Ophthalmol 1994 (10):568-73.

8. Portnoy SL, Insler MS, Kaufman HE. Surgical management of corneal ulceration and perforation: Surv Ophthalmol 1998 Jul-August; 34(1):47-58.

9. Tan D. Conjunctival grafting for ocular surface disease:Curr Opin Ophthalmol 1999 August; 10(4):277-81.

10. Clayman M.Henry. Conjunctival flaps and excision of pterygium: Atlas of Contemporary Ophthalmic surgery:1990:69.

11. Van Rij G, Rinkel-Van Driel B, Beekhuis WH,Renardel de Lavalette JG. Conjunctival Transplantation : Doc Ophthalmol 1987 Sept-October;67 (1-2):145-50

12. Willshaw H. Corneal Surgery: Practical Ophthalmic Surgery:1992-25.

13. Alexandrakis G: Keratitis, Fungal. eMedicine Journal, Volume 2, Number 5, May 2 2001.
(14) Sanitato JJ, Kelly CG, Kaufman HE. Surgical management of peripheral fungal keratitis; Arch Ophthalmol 1984 October:102(10):1506-9.

14. Buxton JN, Fox ML. Conjunctival flaps in the treatment of refractory Pseudomonas corneal

abscess: Ann Ophthalmol 1986 November; 18(11):315-8.

15. Mackman G. Delayed sterile keratitis following radial keratotomy successfully treated with conjunctival flap:Refract Corneal Surgery 1992 Mar-Apr : 8(2):122-4.

16. Alino AM, Perry HD, Kanellopoulos AJ, Donnefeld ED, Rahn, EK. Conjunctival Flaps: Ophthalmology 1998 Jun; 105(6):1120-3

17. Roper Hall MJ. The Conjunctiva, Cornea and Sclera: Stellard's Eye Surgery; 7th Ed .1989:192.

18. Maguire LJ, Shearer DR. A simple method of conjunctival dissection for Gunderson flaps: Arch Ophthalmol 1991 August:109(8):1168-9.