7th International Ocular Surface Society Annual Conference

A Unique Meeting
for Focused and In-depth Discussion

Pterygium

New Pathogenesis and Treatments

Saturday, May 4, 2002

This program is sponsored by

International Ocular Surface Society

PROGRAM

7:30am-8:00am	**Registration**
8:00-8:05 am Scheffer Tseng	Welcome & Overview of the Program
8:05-8:30 am Minas Coroneo	**Opening Lecture** Ocular Exposure to Ultraviolet Radiation in Pterygium Pathogenesis.

I. Pathogenesis

Moderator: *Minas Coroneo*

08:30-08:37 am Tsai	Fibroblasts Isolated from Human Pterygia Exhibit Transformed Cell Characteristics
08:37-08:44 am Touhami	Characterization of Myofibroblasts in Fibrovascular Tissues of Primary and Recurrent Pterygia
08:44-08:51 am Huang	Pseudopterygium: Idiopathic Limbal Deficiency
08:51-08:56 am	**Discussion: Tsai/**Touhami/Huang
08:56-09:01 am Coroneo	Pathogenesis of Human Pterygia: Role of Matrix Metalloproteinases
09:01-09:08 am Meller	Overexpression of Matrix Metalloproteinases in Human Conjunctivochalasis Fibroblasts
09:08-09:15 am Solomon	Upregulation of Matrix Degrading Enzymes in Cultured Conjunctival and Pterygium Fibroblasts by Inflammatory Cytokines
09:15-09:20 am	**Discussion: Coroneo**/Meller/Solomon
09:20-09:27 am Grueterich	Overexpression of Insulin-Like Growth Factor Binding Protein 2 (IGF-BP2) in Pterygium Body Fibroblasts
09:27-09:34 am Yeh	Cytokines Expression by Primary Pterygium Fibroblasts
09:34-09:41 am Beuerman	A Survey of Genes Upregulated in Pterygium
09:41-09:46 am	**Discussion: Beuerman/**Grueterich/Yeh

09:46-10:00 am **Coffee/Tea Break**

10:00- 10:03am Tseng	**Introduction of Award Recipient**
10:03-10:28 am ***Shigeru Kinoshita***	IOSS Lecture Award Cultivated Epithelial Transplantation Using Amniotic Membrane as Carrier Sheet

Comment: Cultured? Is there a difference here between cultured and cultivated?

II. Surgical Procedures

10:28–10:33 am Tan	Outcome Measures for Pterygium Surgery
Part A: Conjunctival Autograft	**Moderator:** *Donald Tan*
10-33-10:38 am Anduze	Pterygium Surgery by Conjunctival Flap Technique with a Reduced Recurrence Rate
10:38-10:43 am Joyaux	Ratio Valuation of Recurrence after Pterygium Removal in an African Origin Population and Efficacy of the Conjunctival Graft Transposition
10:43-10:47 am Syam	Recurrence of Pterygium Following Excision and Inferior Conjunctival Autograft
10:47-10:52 am Tan	Conjunctival Autograft – A Randomized Controlled Trial
11:52-11:57 *am* Koranyi	Cut and Paste. Pterygium Surgery with use of a Fibrin Tissue Adhesive (Tisseel Duo Quick, Baxter)
11:57-12:07 am	**Discussion: Tan**/Anduze/Joyaux/Syam/Koranyi

12:07-12:37 am **Video Panel- How I Do It**

Anduze	Conjunctival Flap Technique: Made It Simple
Joyaux	Conjunctival Autograft
Coroneo	Beheading the Pterygium and Detailing the Free Limbal Graft.
Raju	Pterygium Stripping and Conjunctival Graft
Tan	Conjunctival Autograft – Keys to Success
John	Conjunctival Mini-Autograft
Koranyi	Cut and Paste with a Fibrin Tissue Adhesive

12:37-1:30 pm		**Lunch Break**

Part B: Amniotic Membrane Graft vs. Conjunctival Autograft		**Moderator:** ***Scheffer Tseng***
1:30-1:35 pm	Sangwan	Outcome of Pterygium Surgery at Tertiary Eye Care Center: 10 Year Review of All The Techniques
1:35-1:40 pm	Ma	Comparison of Amniotic Membrane Graft (AMG) and Conjunctival Transplantation (CT) for The Management of Primary and Recurrent Pterygia
1:40-1:45 pm	Solomon	Amniotic Membrane Transplantation Following an Extensive Removal of Primary and Recurrent Pterygia
1:45-1:50 pm		**Discussion: Sangwan/**Ma/Solomon

Part C: Surgeries for Recurrent Pterygium		**Moderator:** *Shigeto Shimmura*
1:50-1:55 pm	Shimmura	Amniotic Membrane Graft and Conjunctival Autograft for Recurrent Pterygium
1:55-2:00 pm	Park	Clinical Result and Technique of Autolimbal Graft for Recurrent Pterygium
2:05-2:10 pm	Ti	Conjunctival Strip and Amniotic Membrane Transplantation for Pterygium
2:10-2:15 pm	Georgiadis	Preserved Amniotic Membrane Transplantation for the Management of Recurrent Pterygium
2:15-2:20 pm		**Discussion: Shimmura/**Park/Ti/Georgiadis

2:20-2:50 pm **Video Presentation Panel - How I Do It**

John	Pterygium Excision with Amniotic Membrane Transplant
Ma	Wide Excision of Pterygium Tissue
Park	Pterygium Surgery
Sangwan	Conjunctival limbal autograft and AMG
Tseng	Folded Amniotic Membrane Graft for Pterygium Surgery

Part D: MMC, Unusual Pterygium, and Complications	**Moderator:** *Abraham Solomon*
2:50-2:58pm Solomon	Long Term Effects of Mitomycin C in Pterygium Surgery – 10 Years Experience + video
2:58-3:03pm Sano	Intraoperative Use of MMC for Pterygium Surgery
3:03-3:08pm Sangwan	Combined Treatment of Multi-Recurrent Pterygium A Report of Two Cases with Long Terms FollowUp
3:08-3:13 pm	**Discussion: Solomon**/Sano /Sangwan
	Moderator: *Virender Sangwan*
3:13-3:18pm Kobayashi	Multi-Layer Amniotic Membrane Graft for Pterygium in a Patient with Xeroderma Pigmentosum.
3:18-3:23pm Ma	Amniotic Membrane Graft for the Management of Scleral Melting and Corneal Perforation in Recalcitrant Infectious Scleral and Corneoscleral Ulcers
3:23-3:28pm Sangwan	Management of Necrotizing Scleritis Following Pterygium Surgery and MMC with Immunosuppression and Scleral Patch Graft.
3:28-3:33pm Ti	Managing severe Scleral Melting following Pterygium Surgery
3:33-3:38m Espana	Amniotic Membrane Transplantation and Conjunctival Limbal Autograft for Total Limbal Deficiency
3:38-3:45pm	**Discussion: Sangwan**/Kobayashi/Ma/Ti/Espana

3:45-4:00pm	**Coffee/Tea Break**

III. New Therapies	**Moderator**: ***Mark Mannis***
4:00-4:07pm Fossarello	Photodynamic Therapy of Pterygium with Verteporfin (Visudyne™) with immunohistochemical Study of the Local Immune System in Pterygium Therapy.
4:07-4:14pm Mannis	Efficacy and Safety of Recurrent Pterygium Surgery Using Human Processed Pericardium
4:14-4:21pm Ang	The Development of a Human Conjunctival Equivalent under Serum-Free Conditions

4:21-4:28pm Tan	Using Autologous Cultured Conjunctiva for Pterygium Surgery: a New Therapeutic Modality
4:28-4:35pm Karp	Perilesional and Topical Interferon Alfa-2b For Conjunctival and Corneal Neoplasia
4:35-4:55pm	**Discussion: Mannis/**Group

Adjourn

Cocktail (Salon B&C) and Photo

DISCLOSURE

This disclosure is not intended to suggest or condone bias in any presentation, but is made to provide participants with information that might be of potential importance to their evaluation of a presentation.

Scheffer C. G. Tseng, M.D., Ph.D. has obtained patents on the method of preparation and clinical uses of amniotic membrane. In addition, Dr. Tseng and his laboratory associates will discuss basic research and clinical applications on amniotic membrane. Dr. Tseng has a financial interest in Bio-Tissue, which is a tissue bank procuring, processing and distributing preserved amniotic membrane for research and clinical uses.

COURSE OBJECTIVES

Upon completion of this conference participants should be above to understand the published and new knowledge concerning the pathogenesis and new medical and surgical therapies for treating patients with pterygium.

OPENING LECTURE

OPENING LECTURE

Ocular Exposure to Ultraviolet Radiation in Pterygium Pathogenesis.

Presenter: Professor M Coroneo, M.D.

Associates:

Affiliation: Department of Ophthalmology, University of New South Wales at Prince of Wales Hospital, Sydney, NSW, Australia.

Pterygium, the most obvious of the sun-related eye diseases (the ophthalmohelioses) is a uniquely human disease. The unravelling of the reasons for this in recent years[1-3] has provided important insights into pathogenesis. While there is substantial evidence supporting the hazardous effects of ultraviolet radiation, there remain concerns over an explanation for the spatial specificity of conditions such as pterygium and cortical cataract and photocytotoxic energy dosage.

We have identified a mechanism that could mediate actinic damage in the anterior eye. Given that the human eye is unique in the extent of its limbal exposure and temporal field of vision, we have observed that the extreme circumference of the corneal dome can refract light to focal areas of concentrated light in the eye. This peripheral focusing of light results in peak intensities of approximately 22.5x incident values at the limbus and 7.5x at the lens equator, the location of stem cells that may be vulnerable to actinic damage. We will review the evidence including computer modelling and ray tracing and field measurements to support this hypothesis.

These observations have implications for the design of protective devices – conventional sunglasses offer little protection against peripheral light focusing phenomena. Since the eye is one of the few places where focusing of ultraviolet light occurs in biology, pterygium prevalence may provide early human biological warning of increased ultraviolet insolation which has occurred with thinning of the ozone layer.

1. Coroneo MT, Di Girolamo N, Wakefield D. Curr Opin Ophthalmol.1999;10:282-8.
2. Coroneo MT. Br J Ophthalmol. 1993;77:734-9.
3. Dushku N, John MK, Schultz GS, Reid TW. Arch Ophthalmol.2001;119:695-706.

Part I. PATHOGENESIS

Fibroblasts Isolated from Human Pterygia Exhibit Transformed Cell Characteristics

Presenter: RJF Tsai, M.D.

Associates: JK Chen, M.D.

Affiliation: Chang Gung Memorial Hospital, Chang Gung University,Taiwan

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Purpose: Pterygium is a degenerative corneal limbal process and UV irradiation has been suggested as being a major environmental predisposing factor. The invasive nature of the fibroblasts associated with pterygia raises the question as to whether these cells are transformed.
Methods: To test this hypothesis, we established fibroblast strains from autologous and heterologous pterygial and conjunctival specimens, respectively, from subjects between 40 to 50 yr of age, and compared their growth characteristics in culture.
Results: All pterygial fibroblast strains exhibited a reduced dependence on serum and exogenous growth factors for growth and reached a saturation population density that was threefold higher than conjunctival fibroblasts cultured under the same conditions. In addition, all pterygial fibroblast strains were able to form colonies in soft agar in 5% fetal bovine serum at a 6.0 to 7.5% efficiency. Under the same experimental conditions, none of the conjunctival fibroblast strains were able to grow.
Conclusions: The results presented support the conclusion that pterygial fibroblasts have acquired many of the properties of the transformed phenotype.

The Key Issue is: Pathogenesis of Pterygium

[Note]:

Characterization of Myofibroblasts in Fibrovacular Tissues of Primary and Recurrent Pterygia

Presenter: [1]A Touhami, M.D.

Associates: [2]M Del Valle, M.D., [3]RH Rosa, Jr., M.D., [4]S Dubovy, M.D., [1]SCG Tseng, M.D., Ph.D.

Affiliation: [1]Ocular Surface Center and Ocular Surface Research &Education Foundation , Miami, Florida, USA. [2] Department of Ophthalmology, Barranquilla, Colombia, [3]Department of Ophthalmology, Texas A&M University System Health Science Center, Temple, Texas, USA. [4] Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, Florida, USA

Purpose: To investigate the presence and role of myofibroblasts, ie, fibroblastic cells with smooth muscle differentiation in pterygium fibrovascular tissue.
Materials and Methods: In 74 surgical cases, 46 primary pterygium and 28 recurrent pterygium performed in patients ranging from 22 to 79 year old, the 86 excised pterygium tissue specimens including the head, the body, and the fibrovascular tissue was evaluated for the presence of myofibroblasts. Specimens displaying cells with the characteristics of myofibroblasts were identified by H & E staining and confirmed by both immunohistochemistery and electron microscopy. Exenteration specimens were used as a positive control.
Results: The presence of myofibroblasts was noted in 86%of the specimens evaluated. Interestingly most of the myofibroblasts were depicted in the fibrovascular tissue. Alpha smooth muscle actin or desmin, both markers of the myogenically differentiated and chronically contractile subpopulation, could be detected in a large majority of the examined specimens using immunohistochemistery, and a myofibroblasts pseudopodal activity was observed by the electron microscopy..
Conclusion: This study clearly demonstrates the involvement of contractile fibroblasts (myofibroblasts) in the histopathogenesis of pterygia. The upregulation of alpha-smooth muscle actin seems to be the key cellular abnormality among all well-known proliferative characteristics of pterygium.

The Key Issue is: Cell origin and pathogenesis of abnormal myofibroblasts in pterygium may help unravel the development and progression of pterygium and formulate surgical strategies in the future.

[Note]:

Pseudopterygium: Idiopathic Limbal Deficiency

Presenter: AJW Huang, M.D.

Associates:

Affiliation: Dept. of Ophthalmology, University of Minnesota

We have managed 2 healthy adult patients with pseudo-pterygium characterized by marked idiopathic conjunctival ingrowth. Impression cytology confirmed the presence of limbal stem cell deficiency in both cases.Two additional unrelated pediatric cases of bilateral pseudo-pterygium with presumed diagnosis of Benign Hereditary Intraepithelial Dyskeratosis (BHID) were also managed. Topical cyclosporine A and alpha-interferon led to significant regression of the conjunctival ingrowth in one adult and one pediatric patient, suggesting the potential role of anti-inflammatory therapy in managing these patients.

The Key Issue is: Impression cytology is crucial to establish the limbal deficiency and anti-inflammatory therapy may suppress the conjunctival ingrowth.

[Note]:

Pathogenesis of Human Pterygia: Role of Matrix Metalloproteinases

Presenter: [1] M Coroneo, M.D.

Associates: [2]D Wakefield, M.D, [2]N Di Girolamo, M.D

Affiliation: [1] Department of Ophthalmology,University of New South Wales at Prince of Wales Hospital, Sydney, NSW, Australia.[2] Inflammation Research Unit, School of Medical Sciences, Department of Pathology, University of New South Wales, Australia.

Purpose: Pterygia represent an invasive, proliferative, fibrovascular growth of limbal origin but of unknown pathogenesis. Epidemiological evidence supports an UV-mediated mechanism of pterygium formation. Our research efforts in recent the years have focused on the possible involvement of the matrix metalloproteinase (MMP) family of enzymes in this disease. Under stringent conditions, MMPs are involved in normal physiological processes such as wound healing and embryogenesis. However, any breakdown in this exquisite regulation may result in diseases, such as rheumatoid arthritis, malignancy and ocular disease.

Methods: Using a collection of formalin-fixed, paraffin-embedded resected pterygia, whole eye specimens with pterygia attached, and normal conjunctiva, we applied several histological techniques to determine (i) the spatial distribution, (ii) the profile of expression, and (iii) the activation status of several MMPs in this disease. In the absence of an animal model, our proficiency to culture pure long-term cultures of pterygium epithelial cells (PEC) enabled us to determine which MMPs are expressed by these cells under either control or inflammatory conditions.

Results: Abundant staining for several MMPs and their natural inhibitors (TIMPs) was observed not only in resected pterygium specimens, but also at the advancing pterygium edge where differential expression was noted within the epithelial cells. In contrast, significantly less-to-no staining was detected in normal conjunctival specimens. Most importantly, our results demonstrate that some of these enzymes were produced in their functionally active configuration. Using our *in vitro* model, the induction of MMPs and TIMP-1 was observed when PEC were treated with two potent pro-inflammatory cytokines (TNF-α and IL-1).

Conclusion: The combination of our *in vivo* and *in vitro* data strongly implicated the MMPs in the pathogenesis of pterygia. As to what triggers their abundant expression is the focus of our ongoing investigations. Recently, we have shown that cytokines such as IL-6 and –8 can be induced in both cultured PEC and pterygium tissue following UV exposure. It remains to be determined whether such cytokines are capable of modulating the expression of MMPs in our model as they can in other systems.

Overexpression of Matrix Metalloproteinases in Human Conjunctivochalasis Fibroblasts

Presenter: [1]D Meller, M.D.

Associates: [2]DQ Li, [3]SCG Tseng

Affiliation: [1]Dept. Of Ophthalmology, University of Essen, Essen, Germany; [2] Cullen Eye Institute, Houston, TX.USA. [3] Ocular Surface Center and Ocular Surface Research and Education Foundation, Miami, Florida, USA.

Overexpression and increased activities of matrix metalloproteinases (MMPs) have recently been reported in cultured conjunctival fibroblasts from patients with conjunctivochalasis.These data help explain how conjunctivochalasis manifests excessive degradation of the conjunctival matrix and Tenon's capsule. Therefore, we have established an in vitro model for matrix degradation using amniotic membrane (AM) as substrate. Expression of different MMPs in normal and conjunctivochalasis fibroblasts cultured on AM were found to be elevated compared to cultures on plastic. The role of certain inflammatory cytokines in modulating expression of MMPs in fibroblasts was investigated. IL-1beta markedly and TNF-alpha to lesser extent increased mRNA and protein expression of MMP-1 and MMP-3 in conjunctivochalasis fibroblasts when compared with normal conjunctival fibroblasts and with their nonstimulated counterparts. In conjunctivochalasis fibroblasts and normal conjunctival fibroblasts, TNF-alpha, but not IL-1beta, induced a gelatinolytic activity of MMP-9. Expression of MMP-2, TIMP-1, and TIMP-2 mRNA and protein was not influenced by IL-1beta or TNF-alpha, and no difference was found in the gelatinolytic activity of MMP-2 between both cell types. Inflammatory cytokines such as IL-1beta and TNF-alpha, which can potentially be derived from the ocular surface and tears, may be responsible for increased expression of MMPs in cultured conjunctivochalasis fibroblasts. Ocular inflammation might be one important denominator in the pathogenesis of conjunctivochalasis.

[Note]:

Upregulation of Matrix Degrading Enzymes In Cultured Conjunctival And Pterygium Fibroblasts By Inflammatory Cytokines

Presenter: [1]A Solomon, M.D.

Associates: [2]DQ Li, M.D., Ph.D., [3]SB Lee, M.D., [4]SCG Tseng, M.D., Ph.D.

Affiliation: [1] Department of Ophthalmology, Hadassah University Hospital, Jerusalem; [2] Cullen Eye Institute, Houston, Texas; [3] Singapore National Eye Center, Singapore; [4] Ocular Surface Center and Ocular Surface Research and Education Foundation, Miami, Florida,USA.

Purpose: To examine the expression patterns of extracellular matrix degrading enzymes in cultured primary pterygium body fibroblasts activated by cytokines and growth factors potentially derived from ocular surface epithelial cells and tears.
Methods: EGF, TGF-α, PDGF-BB, IL-1β, bFGF, TGF-β1, TNF-α or IL-6 were added at 10 ng/ml to early passaged pterygium body fibroblasts (PBF) or normal human conjunctival fibroblasts (HJF) in a serum-free medium. Expression of transcripts and proteins of MMP-1, MMP-2, MMP-3, MMP-9, TIMP-1, TIMP-2 was determined by Northern hybridization, ELISA and Western blotting, respectively. Gelatin and casein zymographies were performed to determine the activity of MMP-2 and -3, respectively.
Results: IL-1β and TNF-α dramatically increased the mRNA and protein expression of MMP-1 and MMP-3 in cultured PBF when compared to normal HJF, and to their non-stimulated counterparts cultured in a serum-free medium. EGF and TGF-α also up-regulated MMP-3 in PBF when compared to HJF.
Conclusions: Chronic inflammatory stimulation by IL-1β and TNF-α, which potentially can be derived from the ocular surface and tears, may be responsible for increased expression of MMPs in cultured pterygium body fibroblasts. Additional stimulation of bFGF to enhance uPA may stimulate proliferation and invasiveness of pterygium body fibroblasts. These data have clinical implications on progression of pterygium and recurrence associated with incomplete excision of pterygium body fibroblasts under the influence of ocular surface inflammation.

The Key Issue is: Inflammatory cytokines from the conjunctiva and tears induce MMPs in pterygium fibroblasts

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[Note]:

2 (IGF-BP2) in Pterygium Body Fibroblasts

Presenter: [1]M Grueterich, M.D.

Associates: [2]A Solomon, M.D., [3]DQ Li, Ph.D., [4]D Meller, M.D., [5]SB Lee, M.D., [6]SCG Tseng M.D., Ph.D.

Affiliation: [1]Bascom Palmer Eye Institute, University of Miami, Miami, FL,USA; [2] Department of Ophthalmology, Hadassah University Hospital, Jerusalem; [3] Cullen Eye Institute, Houston, Texas, USA; [4]Dept. Of Ophthalmology, University of Essen, Essen, Germany; [5]Singapore National Eye Center, Singapore; [6]Ocular Surface Center and Ocular Surface Research &Education Foundation, Miami, FL,USA.

Purpose: To examine the expression pattern of Insulin-like growth factor binding protein 2 (IGF-BP2) in cultured primary pterygium fibroblasts and compare it to normal conjunctival fibroblasts.

Methods: Profile of gene expression by normal conjunctival and primary pterygium fibroblasts was performed by a cDNA micro-array. The overexpression of IGF-BP2 thus identified was further confirmed by RT-PCR and western blotting using cultured cells, and by immunohistochemistry on primary pterygium and normal conjunctival tissue sections.

Results: A dramatically increased expression of IGF-BP2 mRNA was demonstrated in cDNA micro-array membranes from 2 different pterygium fibroblasts. This finding was confirmed by RT-PCR in 4 additional different pterygium fibroblasts, and by Western blot analysis of their culture supernatants. Immunohistochemistry of frozen sections from primary pterygium demonstrated an increased staining in extracellular matrix of the stroma, compared to that of the normal conjunctiva. IGF-PB2 was also found in goblet cells of both normal conjunctival and pterygium epithelia.

Conclusions: The increased expression of IGF-BP2 mRNA and protein in pterygium fibroblasts is another strong evidence to support the transformed phenotype of these cells, and helps explain why there is increased growth of fibrovascular tissue. This phenotype may be used as a marker to assess the malignant nature of pterygium growth and recurrence.

The Key Issue is: The overexpression of IGF-BP2 of pterygium fobroblasts is a strong evidence for their transformed phenotype and helps to explain their aggressive growth. IGF-BP2 might be a marker for the tendency of pterygium recurrence after surgical removal.

[Note]:

Cytokines Expression by Primary Pterygium Fibroblasts

Presenter: LK Yeh, M.D.

Associates: CL Ching, , M.D., CF Lin, , M.D., RJF Tsai, M.D.

Affiliation: Chang Gung Memorial Hospital, Chang Gung University, Taiwan.

Purpose: Activated pterygium fibroblasts secreted some cytokines that may play an important role in pterygium progression. Previously, we showed that pterygium fibroblasts exhibit some characteristics of transformed cells. In this study we further study the cytokines expressed by fibroblasts from primary pterygium and normal conjunctiva both in vitro and in vivo.
Methods: Normal conjunctival fibroblasts and pterygium fibroblasts were cultured, then RT-PCR for TGF-β, b-FGF, and PDGF-BB were performed. TGF-β, b-FGF and PDGF-BB in culture supernatant were detected by ELISA. Immunohistochemical staining for PDGF-BB were performed using frozen pterygium specimens .
Results: The TGF-βand b-FGF mRNA expression were similar in both the normal conjunctival and pterygium fibroblasts; however, only the pterygium fibroblats expressed PDGF-BB mRNA. ELISA also showed that pterygium fibroblasts secreted PDGF-BB protein. Immunohistochemical staining showed the immunoreactivity of PDGF-BB in the stromal layer of pterygium specimens.
Conclusions: The pterygium but not the normal conjunctival fibroblasts overexpressed PDGF, which may contribute to the transformed nature of pterygium fibroblasts and in turn the pathogenesis of pterygium.

The Key Issue is: Cytokine expression

[Note]:

A Survey of Genes Upregulated in Pterygium

Presenter: [1]RW Beuerman, M.D.

Associates: [2]D Tan, M.D.

Affiliation: [1]LSU Eye Center, [2]Singapore Eye Research Institute
National University of Singapore

Purpose: To use DNA array technology to uncover the genes that characterize the phenotype of primary pterygium.
Methods: Pterygium and uninvolved conjunctiva (as a remnant of the repair process) were collected at the time of surgery and frozen in liquid nitrogen. In the first study, the tissues of 29 patients were pooled for analysis by Incyte array which contained 8,632 entries. Analysis was by Gemtools 2.5.
Results: The array was validated for quality control issues and the sensitivity was found to be 1/100,000 copies. Overall, there were 50 genes that were upregulated, of these five were ESTs. Three genes, tyrosinase-related protein-1, collagen type 1, complement component-3 were either upregulated or affected by UV radiation. Several genes were related to cell proliferation and transformation, S-100 protein, microseminoprotein-beta, and SNC73. Fibronectin 1 was strongly upregulated, which may be due to the interaction with collagen 1. These studies are continuing using the 17,000 entries of the U133 A chip from Affymetrix.
Conclusions: A number novel genes were found using DNA array methods which strongly suggest a role for UV in the pathogenesis of pterygium and which may provide new leads for research.

[Note]:

IOSS Lecture Award

IOSS Lecture Award

Cultivated Epithelial Transplantation Using Amniotic Membrane as Carrier Sheet

Presenter: Professor Shigeru Kinoshita, M.D.

Associates:

Affiliation: Department of Ophthalmology, Kyoto Prefectural University of Medicine, Japan

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We established a tissue engineering system for making transplantable corneal epithelial sheets. Briefly, either explants or suspensions of corneal epithelial stem cells were cultivated for three to four weeks on denuded amniotic membrane carrier with 3T3 fibroblast co-culture and airlifting. The cultivated cells showed four to five layers of stratification and were well differentiated. The epithelial sheet showed well-constructed tight junction formation at the most superficial cell layer, and cell proliferative activity at the basal cell layer. The suspension culture cells were more compact in terms of extracellular space than the explanted culture cells. Subjects receiving transplants of cultivated corneal epithelial sheets of donor origin were patients with Stevens-Johnson syndrome, ocular cicatricial pemphigoid, and chemical injury. Allografting of this sheet for ocular surface reconstruction was successful in all cases; the entire corneal surface was completely covered by the transplanted corneal epithelium, with several allografting troubles.

Thus, to establish autologous mucosal epithelial transplantation we have also been investigating cultivated oral mucosal epithelial cells as a substitute for cultivated corneal epithelial cells. In rabbit experiments, the corneal surface can be transparently reconstructed using cultivated oral mucosal epithelial cells, a fact indicating the pote[illegible] of such cells as a tool for ocular surface reconstruction.

Comment: Cultured? Is there a difference here between cultured and cultivated?

Comment: Ok? cell suspensions…..of cells seems redundant…

Comment: cultivated or cultured?

Comment:

Comment:

Comment: here too…

Comment:

Comment:

Comment: easily? readily? toka..

Section II: Surgical Procedures

Outcome Measures for Pterygium Surgery

Presenter: [1,2,3]D Tan, M.D.

Associates: [2,4]Saw Seang Mei, [5]Edwin Chan

Affiliation: [1]Singapore National Eye Centre, [2]Singapore Eye Research Institute, [3]Dept of Ophthalmology, National University of Singapore, [4]Dept of Community, Occupational and Family Medicine, University of Singapore, [5]Clinical Trials and Epidemiological Research Unit

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With evidence-based medicine (EBM) becoming the new paradigm in clinical management decisions, the plethora of treatment procedures for pterygium makes it essential for us to determine the scientific validity and interpretation of data of the numerous clinical trials available in the pterygium literature by a EBM review process.

Clinical trials evaluating pterygium surgery currently report on various safety and efficacy parameters but these are unfortunately not standardized, leading to difficulties in comparison and validation. The commonest efficacy parameter reported on is the recurrence rate associated with the treatment; however, it is clear that the definition for pterygium recurrence varies widely in the literature. Furthermore, standardized clinical definitions should be adopted for the staging and grading of pterygia, determination of what constitutes a successful outcome, and universal terminologies utilized to describe various surgical procedures.

The "gold standard" study design remains the randomized controlled clinical trial (RCT), and all new treatments for pterygium should ultimately be evaluated by high quality RCTs.

The Key Issue is: High quality clinical trials with uniform standards and definitions are essential in the evaluation of current and new treatment modalities for pterygium.

[Note]:

A. Conjunctival Autograft

Pterygium Surgery By Conjunctival Flap Technique With A Reduced Recurrence Rate

Presenter: AL Anduze, M.D.

Affiliation: St Croix Eye group, Inc. University of Florida, Jacksonville, FL.USA

The removal of pterygium and coverage of the sclera with conjunctival flaps in 1915 cases over the period between 1984 and 2001...800 cases with flaps only, 1115 cases with flaps and MMC; there were 22 recurrences, 1.26%.

There are six basic steps: the action and reason for each is presented as well as pre-op work-up and medications, anesthesia.

Rationale and advantages of each step is discussed.

The Key Issue is: Reduced recurrence rate (0-2%) with minimum surgery) covering the sclera and vertical orientation of conjunctival vessels

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[Note]:

Recurrence Rate after Pterygium Removal in an African Origin Population and Efficacy of the Conjunctival Graft Transposition

Presenter: JC Joyaux , M.D.

Affiliation: Clinique Saint Paul. Fort de France, Martinique, French West Indies

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Purpose: In a retrospective study regarding 260 consecutive pterygium removals with a conjunctival graft transposition, we analyze the results of the efficacy of this procedure and try to understand the reasons of the recurrences.
Methods: All procedures were performed by the same surgeon (JCJ) during 3 years (1995-1998) with the same procedure.
Results: all the patients were controlled at least one year after the surgery (mean follow-up 32 months), 5 of the 260 patients (1.9 %) presented a recurrence of the pterygium, and 12 (4.6%) a thin invasion of the scar with no fibrovascular tissue only remarkable at the slit lamp and with no complain. All the recurrences were noticed between 4 to 12 weeks after surgery.
Conclusion: The conjunctivo-limbal autograft transposition after cleaving the pterygium is a quick (15 minutes) and safety procedure, which decrease the rate of recurrence. We routinely use this technique since seven years with very few recurrences and became our method of choice for the surgical approach of the pterygium.

The Key Issue is: To evaluate the ratio of recurrence after pterygium removal in a African origin population and the efficacy of the conjunctival graft transposition.

[Note]:

Recurrence of Pterygium Following Excision and Inferior Conjunctival Autograft

Presenter: P Syam, M.D.

Associates: H Eleftheriadis, M.D., CSC Liu, M.D.

Affiliation: Sussex Eye Hospital, Brighton, UK

Purpose:
Methods: Patients who underwent inferior conjunctival autografting for the management of pterygia from september1996 to February 2001 were studied. Outcome was evaluated in terms of recurrence of pterygia defined as fibrovascular ingrowth of ≥ 1.5 mm across the limbus.
Results: Thirty-three eyes, 3 with recurrent pterygia, of 29 patients (15 female) were studied. Mean follow up was 29 months (range 8 to 60). Recurrence occurred in 1 eye (3.3%) in the primary group and in 1 (33.3%) in the recurrent group
Conclusion: Recurrence rate of pterygium following inferior conjunctival autograft is similar to that of superior autografts. Leaving the superior conjunctiva intact is an additional advantage should this be required for future trabeculectomy

The Key Issue is: Retrospective study to Analyze the long term success rate and complications following inferior conjunctival autograft for Primary and Recurrent Pterygium

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[Note]:

Conjunctival Autograft – A Randomized Controlled Trial

Presenter: [1,2,3]D Tan, M.D.

Associates: [1,2]S-P Chee, [4]K Dear, [1,2,3]A Lim

Affiliation: [1]Singapore National Eye Centre, [2]Singapore Eye Research Institute, [3]Dept of Ophthalmology, National University of Singapore, [4]University of Newcastle, New South Wales

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Purpose:To compare success rates of conjuntival autografting and bare sclera excision for primary and recurrent pterygium.
Methods: A prospective controlled trial was performed in which 123 primary and 34 recurrent pterygia were randomized in 2 studies to receive either conjunctival autografting or bare sclera excision by a single surgeon. Pterygium morphology was graded as atrophic, intermediate or fleshy according to an assessment of translucence of the body of the pterygium. Cases were followed up for 12 months and Weibull curves were used to estimate recurrence rates allowing for interval censoring.
Results: In the group with primary pterygium, 38 (61%) of the 62 cases with bare sclera excision recurred, in contrast to 1 (2%) of the 61 cases of conjunctival autograft ($p<0.001$). In the group with recurrent pterygium, 14 (82%) of the 17 bare sclera cases recurred, while no recurrence was encountered in the conjunctival autograft group. Nontranslucency, or fleshiness of the body of the pterygium was a significant risk factor for recurrence in the bare sclera groups ($p<0.001$).
Conclusion: Conjunctival autografting for primary and recurrent pterygium is highly effective in reducing pterygium recurrence compared with bare sclera excision, and recurrence is related to fleshiness of the pterygium.

The Key Issue is: Conjunctival autografting, if properly performed, can result in a low recurrence rate (2%) with an excellent cosmetic result, is a safe procedure, and is greatly superior to simple excision.

[Note]:

Cut and Paste. Pterygium Surgery with use of a Fibrin Tissue Adhesive (Tisseel Duo Quick, Baxter)

Presenter: G Koranyi, M.D.

Affiliation: St. Erik's Eye Hospital, Stockholm, Sweden.

Purpose: Improving pterygium surgery. According to a previous study "Cut and Paste" is secure, faster (10-19 min) and causes significantly less postoperative pain than suturing the transplant.

Methods: 396 eyes (287 patients) with nasal primary pterygium has been operated by the same surgeon (GK). All has got a conjunctival autotransplant glued on the scleral bed following avulsion and excision of the pterygium. Mean follow up time 16 (6-30) months.

Results: 19 (4.8%) recurrences were detected, 3 (0.8%) were reoperated. No transplant loss but one transplant inversion occurred. Not any other complications were seen.

Conclusion: The recurrence rate of "Cut and Paste" is low. It is easy, fast, cheap, causes minimal pain. The method is suitable as first choice when operating primary pterygia.

The Key Issue is: Tissue glue makes the surgery simple

[Note]:

How I do it (Video Presentation) Panel

Video 1: Conjunctival Flap Technique: Made It Simple

Presenter: AL Anduze, M.D

Affiliation: St Croix Eye group, Inc. University of Florida, Jacksonville, FL.USA

Abstract :

1. Incision into body (better visibility of the head)
2. Excision of head (is isolated and removed by careful shaving, sparing the limbal stem cells)
3. Creation of conjunctival flaps (by superior and inferior relaxing incisions, flaps slide together to cover the sclera)
4. Closure of flaps (9-0 non-absorbing suture in one line, for patient comfort, strength of closure, ease of removal)
5. Completion of closure (conjunctival blood vessels should be oriented vertically, parallel to the limbus, for excellent healing and greatly reduced chance of recurrence.)
6. Adjunctive therapy as indicated.

Video 2: Conjunctival Autograft

Presenter: JC Joyaux, M.D

Affiliation: Clinique Saint Paul. Fort de France, Martinique, French West Indies

Abstract :

First step, we delimit the size of the conjunctival side of the pterygium with scissors dissection, then using fine forceps, we keep the pterygium tissue under tension and minimize the dissection of the unaffected tissue, always looking at a superficial dissection (cleaving level) of the head and body until the limbus is reached ; all the Tenon's capsule from beneath the pterygium is excised.

Second step, the globe is rotated inferomedially to expose an area of uninvolved superior bulbar conjunctiva. A thin dissection of this conjunctiva is done with limbo-conjunctival ablation, which is rotated, placed in the same anatomical position (limbus against limbus) and secured with absorbable suture (e.g., 8-0 Vicryl) on a spatulated needle, to permit a transplantation of the stem cells.

Video 3: Beheading the Pterygium and Detailing the Free Limbal Graft.

Presenter: M Coroneo, M.D

Affiliation: Department of Ophthalmology, University of New South Wales at Prince of Wales Hospital, Sydney, NSW, Australia.

Abstract : It is well recognised that there is a significant surgeon factor in pterygium surgery outcomes[1]. Yet the detail of pterygium surgery technique is not well described in most publications. Video clips will be presented showing two key aspects of surgery – excision of the pterygium head and preparing the limbal aspect of the free limbal/conjunctival graft.
We have previously[2] described using the tip of a 23-gauge needle as a cutting tool to excise the pterygium head. The incision is precisely controlled with minimal excision of unaffected tissue, particularly at the limbus. This is achieved by point cutting edge techniques and varying tissue tension to control sectility.
Similarly a 23 gauge needle is used to dissect into the limbus ensuring that limbal stem cells are included in the limbal reconstruction achieved by limbal/conjunctival transplantation. There is some evidence of increased recurrence in long term follow up in limbal autograft surgery[3] and it is possible that the degree of limbal inclusion in the transplant may play a role.

1. Ti SE, Chee SP, Dear KB, Tan DT. Br J Ophthalmol. 2000;84:385-9.
2. Coroneo MT. Ophthalmic Surg. 1992;23:691-2.

Video 4: Pterygium Stripping and Conjunctival Graft

Presenter: VK Raju, M.D

Associates: OG Krishna, M.D, G Madhavi, M.D

Affiliation: West Virginia University, USA. Srikiran Eye Institute, Kakinada, India.

Abstract : Pterygium was described in Sanskrit literature (1000BC) by an ancient indian surgeon, Susrutha. For 30 centuries, man has tried to conquer this little growth called pterygium. It has been incised,removed,split, transplanted, excised, cauterized,.grafted, inverted, galvanized, heated, dissected, rotated, coagulated,

repositioned, irradiated, excimer lasered.

Our method of stripping and autoconjunctival graft is presented.

Video 5:

Presenter: [1,2,3]D Tan, M.D

Title: Conjunctival Autograft – Keys to Success

Affiliation: Singapore National Eye Centre[1], Singapore Eye Research Institute[2], Dept of Ophthalmology, National University of Singapore[3]

Key Steps:

1. Preparation: adequate anesthesia and exposure
2. Good pterygium excision technique
3. Harvesting a thin, Tenon's free autograft
4. Securing the graft

Video 6: Conjunctival Mini-Autograft

Presenter: Thomas John, M.D

Affiliation: Loyola University at Chicago, Maywood, Illinois; Chicago Cornea Research Center, Tinley Park, Illinois

Abstract : The surgical techniques in pterygium excision with conjunctival mini- autograft will be presented in video format under the following headings:

- Fixation technique
- Pterygium excision – scleral & corneal side
- Preparation of bed for conjunctival mini autograft
- Harvesting conjunctival mini-autograft
- Suturing techniques

Video 7: Cut and Paste with a Fibrin Tissue Adhesive

Presenter: G Koranyi, M.D

Affiliation: St. Erik's Eye Hospital, Stockholm, Sweden

Abstract : The steps of the surgery are shown on 3 cases of nasal primary pterygium. Topical and subconjunctival anesthesia, avulsion of the

pterygium head and excision of the pterygium body is performed. A superficial conjunctival autograft is then prepared and attached onto the scleral bed using the fibrin glue.

B. Amniotic Membrane Graft
Vs.
Conjunctival Autograft

Outcome of Pterygium Surgery at Tertiary Eye Care Center: 10 Year Review of All The Techniques

Presenter: VS Sangwan, M.D

Associates: M Fernandes,M.D, AK Bansal, M.D, M Krishnmachary, M.D, P Garg, , M.D, MS Sridhar, M.D, N Gangopadhaya, M.D, GN Rao, M.D

Affiliation: Cornea & Anterior Segment Service, L.V.Prasad Eye Institute, Hyderabad, AP, India

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Retrospective review of pterygium surgery done in past ten year. Compared the outcome with various techniques: bare sclera, primary closure, conjunctival autograft (CAG), AMG, AMG + CLAG. Mean age 50 year with 48% male and 52 % female. The recurrence rate was minimum with CAG (13.9%), maximum with AMG alone (28.9%). All the findings will be presented.

The Key Issue is: Retrospective review of pterygium surgery outcome, comparing excision with amniotic membrane grafting (AMG), Conjunctival autograft (CAG) , Bare sclera, AMG+CLAG (conjunctival-limbal autograft) in about 1100 cases done over last ten years at our institute.

[Note]:

Comparison of Amniotic Membrane Graft (AMG) and Conjunctival Transplantation (CT) for The Management of Primary and Recurrent Pterygia

Presenter: DHK Ma, M.D

Associates: RJF Tsai, M.D, LC See, M.D

Affiliation: Chang-Gung Memorial Hospital, Linko, Taiwan

Amniotic membrane graft (AMG) has been widely applied for the management of various ocular surface diseases including pterygia. We reported a recurrence rate of 3.8 %, 5.4 %, and 3.7 % following AMG (n = 80) conjunctival transplantation (CT; n = 56), post-operative mitomycin C (MMC; n = 54) respectively for primary pterygia. For recurrent pterygia, the recurrent rate was 2.9 %, 14.7 %, and 11.4 % respectively following CT (n = 34), AMG with (n = 34) or without intraoperative MMC (n = 35). Concomitant application of MMC did not further reduce the recurrence rate significantly. The results suggest that AMG may be considered as an effective alternative procedure for primary as well as recurrent pterygia.

The Key Issue is: AMG for the management of pterygia

[Note]:

Amniotic Membrane Transplantation Following An Extensive Removal Of Primary And Recurrent Pterygia

Presenter: [1]A Solomon, M.D.

Associates: [2]RTF Pires, M.D., and [3] SCG Tseng, M.D., Ph.D.

Affiliation: [1] Department of Ophthalmology, Hadassah University Hospital, Jerusalem, Israel; [2]Instituto de Olhos de Goiania, Brazil; [3] Ocular Surface Center and Ocular Surface Research and Education Foundation, Miami, Florida,USA.

Purpose: To evaluate the post-operative outcome and the recurrence rate following extensive removal of primary and recurrent pterygia combined with amniotic membrane transplantation (AMT).

Methods: Fifty-four eyes in 54 patients with either primary (33) or recurrent (21) pterygia were operated by an extensive excision of the lesion followed by amniotic membrane transplantation, and intra-operative injection of a depot corticosteroid.
Cumulative rates of conjunctival (grade 3) and corneal (grade 4) recurrence and incidence of complications were evaluated.

Results: The mean follow-up was 12.8 ± 4.3 months for primary and 14.3 ± 4.9 months for recurrent pterygia. The true recurrence rate (grade 4) was 3.0%, 9.5%, and 5.6% for primary, recurrent, and all pterygia, respectively. The cumulative proportion of recurrence-free eyes at 12 months was 0.90 ± 0.06 for primary and 0.69 ± 0.11 for recurrent pterygia (p=0.047, log-rank test). Removal of the semilunar fold was associated with longer survival times (p=0.063) and decreased failure rate (p=0.046). A similar success rate was achieved in double-head pterygia (1 recurrence in 11 eyes).

Conclusions: AMT is an effective and safe procedure for pterygium surgery, with a relatively low recurrence rate for both primary and recurrent pterygia. It can be a useful alternative to conjunctival autograft when a large conjunctival defect has to be covered, such as in primary double-head pterygia and in large recurrent pterygia.

The Key Issue is: Recurrence rates following AMT for primary and recurrent pterygia

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[Note]:

C.AMG and CA for Recurrent Pterygium

Amniotic Membrane Graft and Conjunctival Autograft for Recurrent Pterygium

Presenter: S Shimmura, M.D.

Associates: J Shimazaki, M.D., K Tsubota, M.D.

Affiliation: Department of Ophthalmology, Tokyo Dental College, Japan

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Purpose: To demonstrate the efficacy of amniotic membrane graft (AMG) with conjunctival autograft (CA) for recurrent pterygium.
Method: Twenty-seven eyes of 27 patients with recurrent pterygium were retrospectively examined. The number of prior surgeries ranged from 1 to 10 (mean 3.1). Of the 27 patients, 12 were treated with AMG and CA, and 15 were treated with AMG and limbal autograft (LA).
Results: Twenty-three out of 27 eyes (85.2 %) showed no recurrence after an average follow-up of 67 weeks. Of the 4 eyes that suffered a recurrence, 3 had LA and 1 had CA with AMG.
Conclusion: AMG with CA is equally effective as LA in the treatment of recurrent pterygium.

The Key Issue is: Amniotic membrane and conjunctival free flaps are sufficient for recurrent pteyrgia, without the need of limbal transplantation

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[Note]:

Clinical Result and Technique of Autolimbal Graft for Recurrent Pterygium

Presenter: [1]WC Park, M.D.

Associates: [2]JC Kim, M.D., [3]TH Choi, M.D.

Affiliation: [1]Dong-A University Hospital, Pusan Korea
[2]Chung-Ang University Hospital, Seoul Korea
[3]HanLim University Hospital, Seoul Korea

We performed wide excision, AMT and autolimbal graft for 28 recurrent pterygium. The recurrence was only one of them

The Key Issue is: .

1.Tenon removal-use Elman electric cauterizer for bleeding control
2.AMT-also cover on corneal epithelial defect area
3.How large the size of autolimbal graft is to be perfect?

[Note]:

Conjunctival Strip and Amniotic Membrane Transplantation for Pterygium

Presenter: [1]SE Ti, M.D.

Associates: [2]E Espana, M.D., [2]SCG Tseng, M.D.,Ph.D.

Affiliation: [1] Singapore Eye Research Institute, National University of Singapore,[2]Ocular Surface Center and Ocular Surface Research & Education Foundation, Miami, Florida, USA

Aim: To evaluate the effect of applying a thin conjunctival strip (CT), in addition to folded amniotic membrane (AM) following pterygium excision.
Methods: Case series by a single surgeon. Thirty-two consecutive patients (Primary=10, Recurrent =22) underwent excision of pterygium with AM grafts to cover the bare sclera defect. A 4 by 1.5-mm CT was applied on the center of the AM. Outcome was measured in terms of recurrence, rate of epithelialization and other complications. Recurrence was defined as regrowth of pterygium on the limbus and cornea.
Results: Mean follow-up time for success cases was 10.8 months. Of the 10 cases of primary pterygium, one recurred; seven of 22 recurrent pterygium failed. Failures occurred early, with more than half in the first 3 months. There was no statistical difference in recurrence rates between this series and a previous case series using AMT only. The benefit of CT was more rapid epithelialization rate, with faster postoperative recovery.
Conclusion: CT with AMT can potentially serve as a useful technique and provides a basis for further studies on in vivo conjunctival expansion.

[Note]:

Preserved Amniotic Membrane Transplantation for the Management of Recurrent Pterygium

Presenter: N. Georgiadis, M.D.

Associates: N. Ziakas, M.D., K. Boboridis, M.D., C. Terzidou, M.D.

Affiliation: AHEPA Hospital, Aristotle University, Thessaloniki, Greece

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Purpose: To present our experience with the use of preserved amniotic membrane in the treatment of recurrent pterygium.
Patients/Methods: 14 patients with 3 to 8 recurrences each of their pterygium following previous surgery were recruited for this study. Male/female ratio was 8/6 and the age range was 43-65 years (mean 51). 8 patients had symblepharon and 4 of them also had restriction of ocular movements. In all patients the pterygium was removed together with the hyperplastic connective tissue (scars) and then the amniotic membrane was sutured to the free conjunctival edges with 10.0 continuous nylon suture. A bandage contact lens was placed on the cornea and symblepharon ring was used when necessary.
Results: During the follow-up period that ranged from 12 to 18 months we faced 2 pterygium recurrences while in the rest of our cases no complication of the healing process was observed. The symblepharon and the motility were restored in all cases.
Conclusion: Preserved amniotic membrane transplantation appears to be very helpful in the treatment of recurrent pterygium. According to our findings it eliminates recurrences and successfully restores ocular motility and symblepharon.

[Note]:

How I do it (Video Presentation) Panel (B, and C):

Video 1: Pterygium Excision with Amniotic Membrane Transplant

Presenter: Thomas John, M.D.

Affiliation: Loyola University at Chicago, Maywood, Illinois; Chicago Cornea Research Center, Tinley Park, Illinois

Abstract : The surgical techniques in pterygium excision with amniotic membrane transplant will be presented in video format under the following headings:

- Pterygium excision – scleral & corneal side (1min)
- Amniotic membrane dissection and placement on the excised bed (2 min)
- Suturing techniques (1 min)

Video 2: Recurrent Pterygium with Symblepharon

Presenter: David HK Ma, M.D.

Affiliation: Chang-Gung Memorial Hospital, Linko, Taiwan

Abstract: Video clips will be shown to emphasize the wide excision of pterygium tissue and even wilder subconjunctival tissue removal. The semilunar fold and caruncle were preserved, followed by creation of a rectangular bare scleral area.

Video 3:

Presenter: Woo-Chan Park, M.D.

Affiliation: Dong-A University Hospital, Pusan Korea

Abstract:

1.Tenon removal-use Elman electric cauterizer for bleeding control

2. AMT-also cover on corneal epithelial defect area
3. How large the size of autolimbal graft is to be perfect?

Video 4: Conjunctival-Limbal Autograft and Amniotic Membrane Graft

Presenter: VS Sangwan, M.D.

Affiliation: Cornea and anterior segment service, L.V.Prasad Eye Institute, Hyderabad,India

Abstract: Would like to show following steps in pterygium surgery:
Excision of head and body,
Suturing technique of AMG,
Harvesting of conjunctival-limbal autograft.

Video 5: Folded Amniotic Membrane Graft for Pterygium Surgery

Presenter: SCG Tseng, M.D.,Ph.D.

Affiliation: Ocular Surface Center and Ocular Surface Research & Education Foundation , Miami, Florida, USA

Abstract : 1. How to perform folded AM
2. How to perform fornix sutures
3. How to add conjunctival graft or strip

D. MMC, Unusual Pterygium and Management of Complications

Long Term Effects of Mitomycin C in Pterygium Surgery – 10 Years Experience

Presenter: A Solomon, M.D.

Associates: FD Raiskup, M.D., I Kaiserman, M.D., D Landau, M.D., J Frucht-pery, M.D.

Affiliation: Department of Ophthalmology, Hadassah University Hospital, Jerusalem.

Purpose: To evaluate the long term effects of intra-operative application of mitomycin C on the recurrence rate, incidence of complications, scleral thickness and the conjunctival epithelium at the surgical site of pterygium excision.

Methods: From 1989 through 1994, ninety-nine patients underwent pterygium excision surgery followed by intraoperative or postoperative MMC application. Patients were examined by slit-lamp biomicrospcopy, and evaluated for recurrence and complications. In an additional group of18 patients, operated between 1995 and 1997 with a single intra-operative application of MMC, impression cytology and high-frequency ultrasound were performed to evaluate the scleral thickness and the conjunctival epithelium morphology at the excision site and at the contra lateral site.

Results: Recurrence was noted in 5 of 99 patients (5%) after a mean follow-up of 125 months (84 to 156 months). Of these, 3 patients (6%) had post-operative MMC, while 2 patients (4%) had intra-operative MMC. An avascular zone at the excision site was noted in 28.9% of patients. None of the patients had scleral thinning or scleral melting. Impression cytology revealed normal conjunctival epithelial cells at the excision area, with rare goblet cells, while a normal conjunctival goblet cell population was demonstrated at the opposite site. No difference was noted between the scleral thickness at the operated site (0.75mm ± 0.07mm) compared with the opposite site (0.74mm ± 0.08mm) (p=0.8).

Conclusions: MMC appears to be safe and effective after a long follow-up period of 10 years. A single application of Mitomycin C at the time of pterygium excision is not associated with reduction in scleral thickness. A normal conjunctival epithelium does not recover at the pterygium excision site.

[Note]:

Intraoperative Use of MMC for Pterygium Surgery

Presenter: Y Sano, M.D., Ph.D.

Associates: U Bando, M.D., C Sotozono, M.D., Ph.D., N Yokoi, M.D., Ph.D., S Kinoshita, M.D., Ph.D.

Affiliation: Department of Ophthalmology, Kyoto Prefectural University of Medicine.

We have evaluated the effects of intraoperative mitomycin C (MMC) on primary and recurrent pterygium. Seventy eight eyes with pterygium (primary 48, recurrent 30 eyes) underwent surgery with intraoperative MMC from 1995 to 2001 in our department. The head of the pterygium was separated at the limbus, and subconjunctival tissue was excised. Three to 5 pieces of sponge soaked in 0.04% MMC were placed under the conjunctiva for 5 minutes. After removing the sponge and irrigation with 300ml of physiological saline, the edge of conjunctiva was sutured onto sclera. In eighteen eyes with restricted ocular motility, lenticule obtained from preserved corneal tissue was placed at the limbus. Mean follow-up was 28 months. The recurrence rate was 2.1% for primary and 10.0% for recurrent pterygium. In one eye, corneal ulcer was observed on 18 days after surgery, which healed by 85 days after surgery. In the other 77 cases, no complication was observed. Intraoperative MMC is an effective and safe procedure with relatively low recurrence rate and few complications.

The Key Issue is: Intraoperative MMC

[Note]:

Combined Treatment of Multi-Recurrent Pterygium – A Report of Two Cases with Long Terms Follow-Up

Presenter: VS Sangwan, M.D.

Associates: S Murthy,M.D. AK Bansal, M.D. GN Rao, M.D.

Affiliation: Cornea and anterior segment services, L.V.Prasad Eye Institute, Hyderabad, India

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Recurrence is a significant complication of pterygium surgery. There is no effective way to completely eliminate this complication but frequency could be reduced with various strategies. In two cases we used all available options but pterygium recurred affecting ocular motility and reduced visual acuity. In desperate attempt to salvage the situation we combined excision with AMG+CLAG+MMC, followed by PTK at a later date. No recurrence noted after 18 months of follow up in both cases.

The Key Issue is: Multi-recurrent pterygium, management options, combined approach with excision+ AMG+ MMC+ CLAG (conjunctiva-limbal autograft), and long-term results.

[Note]:

Multi-Layer Amniotic Membrane Graft for Pterygium in a Patient with Xeroderma Pigmentosum.

Presenter: [1]A Kobayashi, M.D.

Associates: [1]Y Shirao, M.D. [1]Y Segawa, M.D. [1]T Higashide, M.D.[1]S Miwa[1], M.D. [1]K Kawasaki, M.D. and [2]SCG Tseng M.D.,Ph.D.

Affiliation: [1]Dept. of Ophthalmology, Kanazawa University Graduate School of Medical Science, Kanazawa, Japan.[2]Ocular Surface Center and Ocular Surface Research and Education Foundation, Miami, Florida.USA

Background: Xeroderma pigmentosum (XP) is a rare, autosomal recessive, premalignant condition of the skin, and is reported to be associated with ocular surface disorders such as conjunctival malignancy and pterygium. Herein, we report a case of successful management of pterygium with multi-layer amniotic membrane graft (AMG) in a young XP patient.

Case: An 11-year-old Japanese girl, who had been diagnosed as having XP, was referred to us for treatment of her bilateral pterygium. Surgical intervention was attempted for a temporal, presumably fast-growing pterygium in her left eye. Multi-layer amniotic membrane grafting was performed.

Observations: The surgery-induced pain and irritation disappeared within a day. The limbal conjunctival autograft survived on the AMG and re-epithelialization over the AMG was completed in 2 weeks. Best corrected visual acuity improved from 20/32 to 20/16 one month postoperatively. During 1-year follow-up period, no recurrence was noted.

Conclusions: The present case exemplifies that AMG as an adjunct to primary pterygium resection is effective even in a young patient with XP. In addition, multi-layer AMG seems to be useful for protecting bare sclera and extraocular muscles from mechanical injury.

The Key Issue is: Effectiveness of AMT for pterygium in a patient with XP

[Note]:

Amniotic Membrane Graft for the Management of Scleral Melting and Corneal Perforation in Recalcitrant Infectious Scleral and Corneoscleral Ulcers

Presenter: DHK Ma ,M.D.

Associates: RJF Tsai, M.D.

Affiliation: Chang-Gung Memorial Hospital, Linko, Taiwan

Infectious scleritis is one of the most devastating complications following pterygium excision associated with inadvertent application of mitomycin C. Combined wound debridement and systemic antibiotic therapy control the infection more efficiently, yet poor wound healing in event of extensive scleral necrosis and melting remains a major problem, which is detrimental to vision.

We reported 7 cases of infectious scleral and corneoscleral ulcers which were all associated with prior pterygium excision, and were caused by *Pseudomonas* (n = 4), fungi (n = 2), and atypical mycobacterium (n = 1). Amniotic membrane graft (AMG) was performed to promote wound healing or seal corneal perforation. Although culture was still positive in four cases at the time of AMG, no case experienced recurrence of infection. Conjunctival reepithelialization was promoted, and scleral inflammation was decreased. All patients maintained useful vision (20/400 to 20/60) after follow-up for three years. The result suggests that AMG can be considered as an alternative biomaterial to improve wound healing in scleral and corneoscleral ulcerations associated with pterygium excision.

The Key Issue is: AMG for the management of infectious scleritis associated with pterygium excision

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[Note]:

Management of Necrotizing Scleritis Following Pterygium Surgery and MMC with Immunosuppression and Scleral Patch Graft.

Presenter: VS Sangwan, M.D.

Associates:

Affiliation: Cornea and anterior segment services, L.V.Prasad Eye Institute, Hyderabad, India

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Case Report: Complication of pterygium surgery management. Necrotizing scleritis following MMC + Pterygium surgery, management with immunosuprression and scleral patch graft.

[Note]:

Managing Severe Scleral Melting following Pterygium Surgery

Presenter: SE Ti, M.D.

Associates: JA Scott, M.D, D TH Tan, M.D.

Affiliation: Singapore National Eye Centre

Purpose: To describe the technique, and review the indications and success of tectonic corneal lamellar grafting for the management of severe scleral melts following pterygium surgery.
Design: Retrospective Case series.
Methods: Between 1993-1999, tectonic corneal lamellar grafting was performed in 20 cases of scleral necrosis following pterygium surgery.
Main Outcome Measures: Eradication of progressive scleral necrosis, preservation of globe integrity, eradication of infection; pre-and post-operative visual acuity.
Results: Sixteen of 20 cases (80%) developed severe scleral necrosis requiring tectonic surgery following bare sclera pterygium excision with mitomycin C or β-irradiation. The indication for surgery was also therapeutic in 6 cases of progressive infective scleritis from bacterial or fungal micro-organisms. Scleral melting presented 1 month to 20 years following initial pterygium surgery, in healthy, immune-competent adults. Surgery involved 1) Removal of all devitalized or infected scleral tissue surrounding the melt, 2) Use of lamellar or full-thickness donor corneal tissue, fashioned to fit the scleral defect exactly or 0.25 mm diameter larger, 3) Placement of a pedicled or free conjunctiva flap over the corneal lamellar graft. Therapeutic and tectonic success was achieved in 19 cases (95%); in 1 case, recurrence of Fusarium fungal infection led to severe graft necrosis and intraocular spread. Among the cases of infective scleritis, 3 eyes required repeat lamellar grafting to successfully eradicate infection.
Conclusion: The technique of utilizing corneal tissue for tectonic and therapeutic lamellar keratoplasty, combined with aggressive antibiotic therapy for infective cases, can result in a high rate of success in preserving globe integrity and eradicating infection in cases of severe scleral melting following pterygium surgery.

[Note]:

Amniotic Membrane Transplantation and ConjunctivalLimbal Autograft for Total Limbal Deficiency

Presenter: E Espana M.D.

Associates: SCG Tseng, M.D.,Ph.D.

Affiliation: Ocular Surface Center and Ocular Surface Research & Education Foundation , Miami, Florida, USA

Objective: To report the outcome of corneal surface reconstruction with conjunctival limbal autograft (CLAU) and amniotic membrane transplantation (AMT) in a case of conjunctival intraepithelial neoplasia (CIN).

A 63 y/o male with CIN involving 320 degrees of limbus, received topical interferon alfa-2b without success, and was subjected to CLAU with AMT. Following the removal of fibrovascular pannus from the corneal surface, two conjunctival limbal free grafts were harvested from the fellow eye. Amniotic membrane (AM), with the basement membrane side up, was grafted onto the defect created at the donor site, and onto the recipient corneal and limbal sclera before placement of conjunctival limbal grafts.

Results: During an eight months follow-up, the patient experienced symptomatic relief and visual acuity improvement from 5/200 to 20/50.The donor eye showed rapid healing and restoration of the normal limbal landmark.

Conclusions: Limbal conjunctival transplantation is an effective procedure of restoring the corneal surface integrity in eyes with total LSCD due to diffuse CIN. The additional use of amniotic membrane may contribute to a higher rate of success in the recipient eye and a lower rate of complications in the donor eye, as well as allow the simultaneous correction of concomitant cicatricial abnormalities.

[Note]:

Section III: New Therapies

Photodynamic Therapy of Pterygium with Verteporfin (Visudyne™)

Presenter: M Fossarello, M.D.

Associates: E Peiretti, M.D., I Zucca, M.D., A Serra, M.D.

Affiliation: Clinica Oculistica, Dipartimento di Scienze Chirurgiche e Trapianti d'Organo, Università degli Studi di Cagliari, Italy

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Purpose: To assess the efficacy and safety of treating primary, recurrent and secondary pterygium by photodynamic therapy with verteporfin

Methods: Ten consecutive patients with primary, recurrent or secondary pterygium, refusing excisional surgery, were treated with a non thermal laser light at 689 nm delivered directly onto the pterygium after an intravenous infusion of Verteporfin. Postoperative outcome of pterygium was followed clinically (inflammation, intraocular pressure and visual acuity) and photographically (colour photographs and anterior segment fluorescein angiography) for a minimum of two months.

Results: Occlusion and regression of pterygium vascularization was observed by slit-lamp examination and anterior segment fluorescein angiography. Such effect however was not irreversible: in 50% of cases treatment was repeated after a three-month interval. Regression of corneal vessels was followed by corneal scarring. In general, the conjunctival side of the pterygium appeared to be less sensitive to PDT. No serious side effects were observed in this series of patients.

Conclusions: PDT with verteporfin is a safe procedure indicated for patients with a low or medium grade pterygium which refuse a surgical approach: however, multiple sessions may be required. Further research is therefore mandatory in order to standardize this procedure, and to evaluate its possible alternative or complementary role to excisional surgery.

[Note]:

Immunohistochemical Study of the Local Immune System in Pterygium Treated with Photodynamic Therapy.

Presenter: [1]M. Fossarello,M.D.

Associates: [2]C. Maxia, M.D. [2]MT Perra, M.D, [2]F Piras, M.D., [2]E Peiretti, M.D., [1]A Serra, M.D., [2]P Sirigu, M.D., [1]I.Zucca, M.D.

Affiliation: [1]Clinic of Ophthalmology and [2]Department of Cytomorphology, University of Cagliari, Cagliari, Italy.

The aim of the present study is to obtain informations, by immunohistochemical methods, about the immunospecific defense mechanism in pterygium treated by PDT Visudyne, in order to verify if any immunologic change can occur.
Microtome sections of human biopsy specimens of treated by PDT and non-treated pterygia were performed for the immunohistochemical demonstration of IgA, IgM, IgG, T-cells, B-cells, macrophages, antigen presenting cells, and dendritic cells, using the avidin-biotin peroxidase complex (ABC) or streptavidin-biotin alkaline phosphatase method. In the control sections the specificity of the antisera was tested by replacing the primary antibodies with normal serum.
The differences in the distribution pattern of the effector cells of the immune response in both treated and non-treated pterygia are discussed.

[Note]:

Efficacy and Safety of Recurrent Pterygium Surgery Using Human Processed Pericardium

Presenter: [2]M.J. Mannis, M.D., FACS

Associates: [1]L.S. Alvarenga, M.D., [1]L.B. Sousa, M.D., [1]D. Freitas, M.D.

Affiliation: [1]Department of Ophthalmology, Federal University of São Paulo,São Paulo, Brazil; [2]Department of Ophthalmology, University of California, Davis, California.

Supported by Innovative Ophthalmic Products, Inc.

Purpose: To investigate the safety and efficacy of human processed pericardium employed as an onlay after pterygium excision.

Methods: Twenty-five eyes of twenty-five patients (11 female/ 14male) with recurrent pterygium were included in this study. The median age was 50 years (range 24 –89 years). 28.0% of the eyes had been operated on two or more times previously. The mean follow-up was 9.4 months (±2.1 months) (range 8–15 months). Following bare-sclera surgical removal of recurrent pterygium, a patch of processed human pericardium was sutured to cover the area of excision. The pericardium was not covered with conjunctiva, nor were adjuvant radiation or anti-metabolite administered. All patients were treated with a combination dexamethasone 0.1% / chloramphenicol drop t.i.d. for one month. Ketorolac tromethamine 0.5% t.i.d. was added to this regimen after complete corneal re-epithelialization.

Results: Recurrence (any growth >1mm onto the cornea) was detected in 12 patients (48%). The mean time of recurrence was 4.1± 1.7 months. Three patients (12.0%) presented a regrowth of fibrovascular tissue not reaching 1 mm of the cornea. Pyogenic granulomas occurred in three patients, and all of them required surgical excision. Corneal thinning was present in one patient and was treated with a therapeutic contact lens and artificial tears with complete resolution and vascularization of the thinned area. No decrease in visual acuity was observed in any patient.

Conclusions: The use of processed pericardium in pterygium surgery is a safe procedure but is associated with a relatively high rate of recurrence. It should only be considered as an option in managing recurrent pterygium when conjunctival autografting is not an available alternative.

[Note]:

The Development of a Human Conjunctival Equivalent under Serum-Free Conditions

Presenter: [1,2] LPK Ang , M.D.,

Associates: [1,2,3]DTH Tan, M.D.,[2,4]R Beuerman,M.D.,[5]RM Lavker, M.D.,

Affiliation: [1]Singapore National Eye Center, [2]Singapore Eye Research Institute, [3]National University of Singapore,Singapore; [4]LSU Eye Center, LSUHSC, New Orleans, LA,USA; [5]Dept of Dermatology, Univ. of Pennsylvania, Philadelphia, PA,USA.

Purpose. To cultivate human conjunctival epithelial (HCjE) cells under serum-free conditions for the development of a human conjunctival tissue equivalent, and to compare this with serum-containing conditions.

Methods. Normal HCjE cells were cultivated in SFM (Modified MCDB 153) in the absence of lethally treated 3T3 feeder cells. Another group of HCjE cells were grown in serum-containing media (DMEM / Ham's F12 with 10% FBS) with 3T3 feeder cells. Conjunctival explants were cultivated using similar SFM on human amniotic membranes (AM) till confluence. The colony forming efficiency (CFE), number of cell generations and number of serial passages were compared. The cultured HCjE cells were examined by light and electron microscopy. Keratin expression was analysed by immunostaining with the AE-5 monoclonal antibody to keratin K3 and antibody to keratin K4.

Results. In SFM, the CFE of HCjE cells was 15.8%$\pm$5% and the cells underwent 8-10 population doublings (6-7 passages) before senescence. In the presence of serum and feeder layers, the CFE was 26.1%$\pm$ 4%. The morphology of cells under these culture conditions were identical, and the cells expressed the K4 keratin that is associated with conjunctival epithelium, and did not express the corneal specific keratin, K3. Under serum-free conditions, the HCjE cells migrated from the explants to form stratified epithelial sheets on the AM. The time taken to achieve confluence was similar under both conditions. The HCjE cells formed desmosomal contacts, and dermonstrated numerous microvillus infoldings on the apical surface.

Conclusions. HCjE cells were serially cultivated under serum-free conditions, and formed stratified cell layers on AM. The keratin expression of the cultivated cells was similar to that of normal human conjunctival epithelium. These reconstructed human conjunctival tissue-equivalents may provide an alternative method of treating ocular surface diseases.

[Note]:

Using Autologous Cultured Conjunctiva for Pterygium Surgery: A New Therapeutic Modality

Presenter: DTH Tan, M.D.,

Associates:

Affiliation: Singapore National Eye Center

Purpose: To evaluate a new surgical modality for pterygium surgery in which an autologous, conjunctival tissue equivalent was developed using *ex vivo* forniceal conjunctival cell expansion, for conjunctival replacement following pterygium excision.
Methods: In 17 eyes of 17 patients with primary pterygium requiring surgery, conjunctival forniceal stem cell biopsies were obtained 2 weeks prior to pterygium excision, and cultivated on human amniotic membranes (AM) for a mean of 15 days. At the time of pterygium surgery, pterygia were excised, and the autologous cultured conjunctival tissue equivalents were transplanted onto the excised pterygium bed. In 14 cases, an additional amniotic membrane (AM) patch was sutured over the conjunctival tissue equivalent and removed after 3-4 days.
Results: In the eyes with AM patch, excellent results were obtained, with the majority of eyes remaining fully epithelialised at one week. In all eyes, minimal ocular surface inflammation was noted, and patients were asymptomatic within a week of surgery. At a mean follow-up period of 2.8 months, 2 cases of pterygium recurrence have been noted, suggesting a preliminary recurrence rate of 11.7% with this procedure.
Conclusions: Autologous culture of conjunctiva by ex vivo conjunctival stem cell expansion results in a viable conjunctival tissue equivalent which can be successfully retransplanted at the time of pterygium excision. This procedure may also be useful in other forms of ocular surface transplantation and reconstruction, and in many surgical procedures requiring healthy conjunctiva.

The Key Issue is: A new procedure to develop a conjunctival equivalent using ex vivo expansion of autologous conjunctiva can be used successfully to resurface the scleral bed after excision of a pterygium.

[Note]:

Perilesional and Topical Interferon Alfa-2b For Conjunctival And Corneal Neoplasia

Presenter: C.L. Karp, M.D.

Affiliation: Bascom Palmer Eye Institute, University of Miami School of Medicine, Miami, FL, USA.

Background: Conjunctival/Corneal intraepithelial neoplasia (CIN) is a common tumor of the ocular surface that traditionally is treated with surgical excision and cryotherapy. Interferon alfa-2b (IFN) may be a viable medical alternative for the treatment of CIN. The purpose of this paper is to present a series of patients with CIN that have been successfully treated with either subconjunctival injections and/or topical drops of IFN.

Methods: Patients with histologically proven CIN were given the option of surgical excision with cryotherapy or treatment with IFN. Treatment modalities included a single subconjunctival/perilesional injection of recombinant IFNα2b (Schering Plough, Kenilworth, NJ) 3 million units in 0.5 mL combined with topical interferon drops (1 million U/mL) four times a day. Patients were followed weekly until complete resolution of the tumor. Patients with minimal response on topical therapy were treated with perilesional injections three times a week until resolution. The other modality treated the patients with only topical IFN four times a day in the doses of 1 million U/ml or 3 million U/ml until the tumor resolved.

Results: We presented a series of patients who were successfully treated with either topical IFN or a combination of subconjunctival and topical IFNα2b. All patients had complete clinical resolution of the CIN lesions. The time to resolution was much more rapid in the group receiving injections (less than four weeks), compared to the topical only group which had a mean time of 12 weeks to resolution.

Conclusion: IFNα2b may be a viable medical alternative to surgical excision for primary or recurrent CIN. Discussion will also include its potential use following pterygium surgery when sugical margins are found to be positive.

[Note]:

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