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THE CLINICAL SPECTRUM AND MANAGEMENT OF PATIENTS WITH OCULAR SURFACE PYOGENIC GRANULOMA

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Abstract

Purpose: *To describe the clinical spectrum and management outcomes of ocular surface pyogenic granuloma (OSPG) in a series of patients.*

Study Place and Duration: *1 year duration (Jan. 2023 to Dec. 2023) at Institute of Ophthalmology, Mayo Hospital Lahore.*

Methodology: *After ERB approval, 15 consecutive patients with OSPG were enrolled in study period of 1 year. Demographic and clinical data were collected on specially designed proforma. Management consisted of topical steroids for 2 weeks followed by excisional biopsy. Follow up was done till 6 months. Statistical analysis was done using Spss v. 26.*

Results: *Mean age was 35.4 years, with female preponderance (60%). Mean lesion size was 6.2 ± 2.1 mm with range of 3-15 mm and most common location was superior palpebral conjunctiva (N=6, 40%). Among etiological factors, most common cause was following pterygium surgery (N=4, 26.7%). Complete resolution was seen in 14 patients (93.3%) while recurrence was seen only in 1 patient (6.67%). Visual acuity improved significantly after treatment (p-value<0.05) and strong correlation (0.65) was found between lesion size and duration of symptoms.*

Conclusion: *OSPG is a rare condition with varied etiologies. Aggressive management approach yields favorable outcomes. Early diagnosis and treatment are crucial to prevent complications.*

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INTRODUCTION

Pyogenic granulomas are benign vascular lesions that can occur on the ocular surface, typically in response to trauma, surgery, or inflammation. These lesions can cause significant discomfort, cosmetic concerns, and visual disturbances, impacting patients' quality of life (Gupta et al., 2024). Clinically these appear as reddish friable elevated lesions that have tendency to bleed easily even after trivial injury. The definitive management involves complete excision of lesion along with histopathological confirmation. A short course of topical steroids or topical beta blockers can be tried even before surgery (El Taveel et al., 2021).

Despite their prevalence, ocular surface pyogenic granulomas remain poorly understood, with limited studies documenting their clinical spectrum and outcomes (Patra et al., 2022). A few studies have investigated the clinical features and management strategies of ocular surface pyogenic granulomas, with varying results. A study by Dlaim et al. reported giant pyogenic granuloma following squint surgery that improved completely with topical beta blocker and showed no response to topical steroids (Bin et al., 2023). In contrast, a study by Kasturi et al. reported successful treatment of recurrent conjunctival granuloma with sub-conjunctival injections of Bevacizumab (Kasturi et al., 2019).

However, these studies have limitations, including small sample sizes and limited follow-up periods. Moreover, the literature lacks a comprehensive analysis of the clinical spectrum, etiology, and management of ocular surface pyogenic granulomas. This knowledge gap hinders the development of evidence-based guidelines for diagnosis and treatment. This case series of patients with ocular surface pyogenic granulomas aims to provide more insight into this condition by describing their clinical characteristics, etiology, treatment outcomes, and follow-up data. Our research seeks to contribute to the existing knowledge gap in this field, guiding general ophthalmologists in the effective management of ocular surface pyogenic granulomas and enhancing the visual and cosmetic outcomes for affected patients.

Methodology

After getting approval from ethical review board , a prospective case series study was conducted at Institute of Ophthalmology, Mayo Hospital Lahore for a period of 1 year (Jan. 2023 to Dec. 2023). Total of fifteen cases were included in our study using purposive sampling with inclusion criteria of "patients with a diagnosis of ocular surface pyogenic granuloma by clinical examination and confirmed by histopathology". Patients with lack of follow-up, or who have previous history of excision or recurrence were excluded from this study.

After taking informed consent from every patient, demographic data (age, gender, occupation, medical history) was recorded on specially designed proforma. Ocular symptoms (onset, progression, associated features, previous treatments) along with lesion characteristics of size, location, color, and shape were also recorded. Lesions were classified as small (<5mm), medium(5-8 mm), and large(>8mm). Imaging comprised of taking slit lamp photograph or digital photographs with smartphone after taking special cosent from patient.

Management comprised of initial 2 weeks treatment with topical steroids (prednisolone acetate 1% Qid), followed by complete surgical excision and histopathological confirmation. The lesion was coagulated at the base with bipolar cautery before excision and the defect was properly closed with

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sutures where required. Any per-op or post-op complications were noted on proforma. Follow up was done till 6 months post op. Treatment outcome success was defined as complete excision with no recurrence in 6 months follow-up period while failure was defined as residual or recurrent lesions.

SPSS software version 26 was used for data analysis. Mean and standard deviation were used for continuous variables like age, lesion size, while frequency and percentage were used for categorical variables like gender, laterality, clinical features. Independent samples t-test was used to compare lesion size between males and females ($p < 0.05$), and association between lesion size and duration was determined using Pearson's correlation coefficient.

Results

Out of total fifteen cases, 6 were male (40%), and 9 were female (60%). Mean age recorded was 35.4 ± 10.2 years. Right eye was involved in 6 patients (40%) while left eye involvement was present in 9 eyes (60%), and bilateral involvement was not seen in any patient. Various clinical presentations of patients with ocular surface pyogenic granuloma (OSPG) is shown in Figure 1. Duration of symptoms was 6.4 ± 3.5 weeks with range of 0.5-20 weeks.

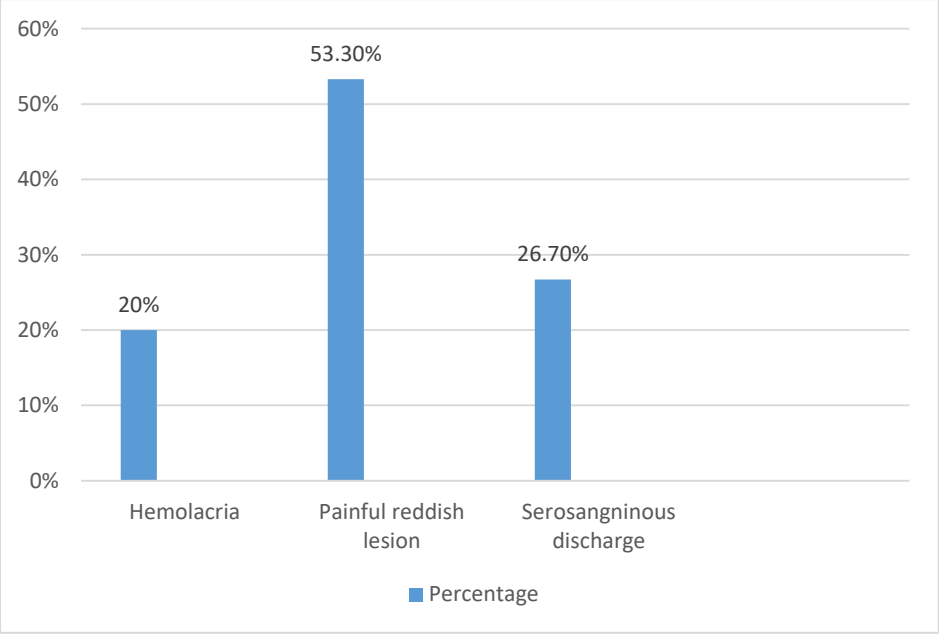

Figure 1: Clinical Presentation of patients with OSPG.

Mean lesion Size was 6.2 ± 2.1 mm with range of 3-15 mm. (Small: 26.7%, Medium: 46.6%, Large: 26.7%). Most common location was superior palpebral conjunctiva (N=6, 40%), followed by nasal bulbar conjunctiva (N=4, 26.7%), temporal bulbar conjunctiva (N=2, 13.3%), DCR incision site (N=2, 13.3%), and at lower punctum around DCR silicone tube (N=1, 6.7%).

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Table 1: Etiological Distribution of Ocular Surface Pyogenic Granuloma

Etiologies	Frequency	Percentage
Following ruptured chalazion	2	13.3%
Following incision and curettage of chalazion	3	20%
Following trauma	1	6.7%
Following squint surgery	2	13.3%
Following DCR surgery	3	20%
Following pterygium surgery	4	26.7%

All 15 patients (100%) received topical steroids, followed by excisional biopsy, coagulation with bipolar, and suturing. Complete resolution was seen in 14 patients (93.3%) while recurrence was seen only in 1 patient (6.67%). Mean time to complete resolution was 6.2 ± 4.1 days following surgery. Complications (infection, scarring) was seen in only 1 patient (6.7%).

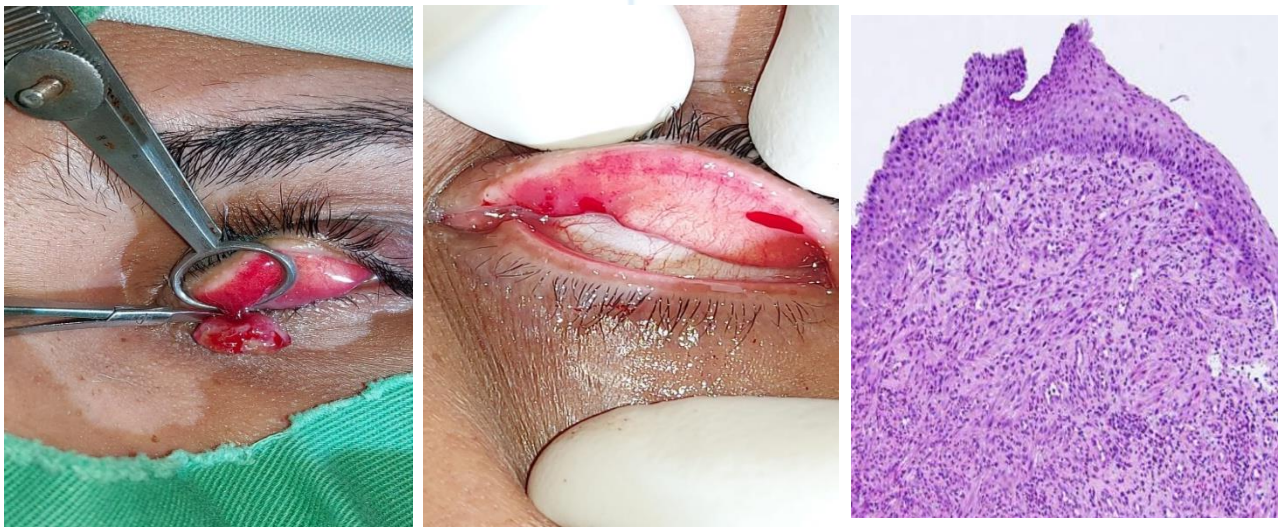

Figure 2: Clinical photograph of a patient with ocular surface pyogenic granuloma before and after treatment along with its histopathology

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Independent sample t-test was used to compare lesion size between males and females. Mean lesion size among females was 6.9±2.4 mm while in males it was 5.7±1.8 with significant p-value of 0.012($p < 0.05$). Correlation between lesion size and duration of symptoms was determined using pearson's correlation test and a strong positive association of +0.65 was found.

Discussion

Pyogenic granuloma, also termed as lobular capillary hemangioma, is a common presentation in out patient department. It is a benign vascular tumor. Palpebral or bulbar conjunctiva is the typical location of pyogenic granuloma that is often encountered by Ophthalmologists. Any inflammatory insult can result in it's development i.e. post strabismus surgery, chalazion rupture, ocular prosthesis and traumatic wound (Nair et al., 2020). Pyogenic granuloma is a misnomer as there is no pus formation but on histopathology it is composed of granulation tissue. It is an abnormal healing response to injury. Pyogenic granuloma can bleed profusely and occasionally bleeding is the presenting symptom in many of these patients (Tidake et al., 2021; Lee et al., 2019). The pathophysiology of pyogenic granuloma includes an imbalance between pro-angiogenic and anti-anfiogenic factors, as a result of a tissue insult (Kasturi et al., 2019). Diagnosis of pyogenic granuloma is clinical. There is often a history of previous causative factors as mentioned earlier. It present as a fleshy red or pink mass on skin and mucosal surfaces. It can have smooth or rough surface and it's shape can be sesile or pedunculated. Histopathological evaluation is necessary to exclude other masquerading lesions (Dillman et al., 1991; Tidake et al., 2021; Oke et al., 2017).Treatment ranges from simple observation to aggressive procedures i.e. surgical resection. Other modalities used in the management include topical medical therapy i.e. steroids, beta blockers, laser ablation, topical anti-metabolites, intralesional steroids, electrocautery and cryotherapy (Lee et al., 2019; Oke et al., 2017). Surgical excision is the widely used method which includes complete surgical excision in order to prevent recurrence and obtain sample for histopathological analysis (Shi et al., 2021). Corticosteroids has been used as a first line therapy for the management of pyogenic granuloma due to its ease of administration and satisfactory results (Lee et al., 2019; Oke et al., 2017).

Our study revealed that pterygium surgery was the most common etiologic factor for the formation of pyogenic granuloma i.e 26.7%, this is in line with a study conducted (Ferry, 1989). The mean age of our patients was 35.4 ±10.2 years while the mean age recorded in previous studies was variable (Wu et al., 2024; Zhang et al., 2018). Male to female ratio was 2:3 in our study while gender predilection was also found to be variable in literature (Zhang et al., 2018; Chen et al., 2020). As far as laterality is concerned left eye was involved in 60% of patients. Zhang et al reported pyogenic granuloma of left eye in 72% of patients. Bilateral involvement was not seen in any of our patients and it's incidence is also rarely reported in literature. Duration of symptoms was 6.4 ±3.5 weeks with a range of 0.5-20 weeks, which is consistent with previous studies (Zhnag et al., 2018). Most common presentation of pyogenic granuloma was in the form of reddish lesion at the site of insult which is the same as observed in literature review (Sagiv et al., 2013).

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Mean size of the lesion found to be 6.2 ± 2.1mm with a range of 3-15mm. This finding is consistent with previous studies. Most common location of pyogenic granuloma observed in our study was superior palpebral conjunctiva(40%) followed by nasal and then temporal bulbar conjunctiva. Wu et.al reported bulbar conjunctiva to be the commonest site of pyogenic granuloma (Wu et al., 2024). Our study revealed complete resolution in 14 patients(93.3%) which is higher than treatment with steroids alone (Wu et al., 2024; Espinoza & Lueder, 2005). Mean time to complete resolution of the lesion following surgery was 6.2 ± 4.1days which was significantly less than using topical steroids or timolol alone (Nair et al., 2020; Alharkan & Alodan, 2019). Treatment outcome success was defined as complete early resolution following surgical excision with no recurrence in 6 months follow-up period and with minimal complications. Recurrence rate was low and was observed in 1 patient(6.67%) which is in line with previous studies and minor complications (infection and scarring) were seen in only 1 patient (Ferry, 1989). These outcomes demonstrate the efficacy of aggressive approach in management of pyogenic granuloma to achieve early favourable outcomes with minimum side effects. Mean size of lesion was found higher among females compared to males likely due to hormonal influence among females that cause increased growth (Ashok et al., 2020).

Our case series had some limitations. The number of cases were limited in this combined medical and interventional series and there was no control group. Intra-ocular pressure was not measured on subsequent visits. Follow-up period was limited to 6 months only. Thus, further studies are needed to determine the efficacy of this approach and the risk of subsequent recurrences. Keeping in view the results of our case series, we recommend an initial use of topical corticosteroids followed by intervention in the form of surgical excision.

Conlusion

OSPG is a rare condition with varied etiologies. Aggressive management in the form of topical steroids followed by surgical excision yields favorable outcomes. Early diagnosis and treatment are crucial to prevent complications.

REFERENCES

AlHarkan, D. H., & AlOdan, H. A. (2019). Infected conjunctival pyogenic granuloma at strabismus surgery site mimicking conjunctival abscess. Saudi Journal of Ophthalmology, 33(1), 109–111. https://doi.org/10.1016/j.sjopt.2018.07.001.

Ashok Kumar, D., Thajudeen, H., & Agarwal, A. (2020). A rare case of symptomatic ocular pyogenic granuloma in pregnancy. Indian Journal of Ophthalmology, 68(8), 1645–1646. https://doi.org/10.4103/ijo.IJO_2239_19

Bin Dlaim, M. S., Alhussein, G. A., Alqahtani, R. S., & Almanea, L. T. (2023). Conservative management of giant pyogenic granuloma post strabismus surgery: A case report and literature review. Cureus, 15(7), e41321. https://doi.org/10.7759/cureus.41321.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Chen, Z., Wang, T., Pan, Q., et al. (2020). Clinicopathologic characteristics and surgical outcome of synthetic fiber conjunctival granuloma. BMC Ophthalmology, 20, 448. https://doi.org/10.1186/s12886-020-01717-1.

Dillman, A. M., Miller, R. C., & Hansen, R. C. (1991). Multiple pyogenic granulomata in childhood. Pediatric Dermatology, 8(1), 28–31. https://doi.org/10.1111/j.1525-1470.1991.tb00835.x.

ElTaweel, A. E. A. I., Saleh, M. M., & AbdelNaby, A. A. (2021). Topical β-blockers for pyogenic granulomas: A comparative clinical trial. Journal of Cosmetic Dermatology, 20(5), 1423–1428. https://doi.org/10.1111/jocd.14123.

Espinoza, G. M., & Lueder, G. T. (2005). Conjunctival pyogenic granulomas after strabismus surgery. Ophthalmology, 112(7), 1283–1286. https://doi.org/10.1016/j.ophtha.2005.01.048.

Ferry, A. P. (1989). Pyogenic granulomas of the eye and ocular adnexa: A study of 100 cases. Transactions of the American Ophthalmological Society, 87, 327–343. https://pubmed.ncbi.nlm.nih.gov/2562522.

Gupta, C., Singh, B. K., & Singh, S. (2024). Epidemiological profile and clinical characteristics of ocular surface lesions: Data from a tertiary eye center. Pan African Medical Journal, 57, 150. https://doi.org/10.11604/pamj.2024.57.150.XXXX

Kasturi, N., Senthamizh, T., Bheemanathi, H. S., & Babu, K. R. (2019). Subconjunctival bevacizumab for recurrent conjunctival pyogenic granuloma. Journal of Pharmacology and Pharmacotherapeutics, 10(1), 42–44.

Lee, Y., Hyon, J., & Jeon, H. (2019). Conjunctival pyogenic granuloma: Cases with undetermined etiologies. Korean Journal of Ophthalmology, 33(5), 483–484. https://doi.org/10.3341/kjo.2019.0017.

Nair, A. G., George, R. J., Natarajan, S., & Jain, V. (2020). Topical timolol for the treatment of conjunctival pyogenic granulomas: Outcomes and effect on intraocular pressure. Indian Journal of Ophthalmology, 68(10), 2170–2174. https://doi.org/10.4103/ijo.IJO_183_20.

Oke, I., Alkharashi, M., Petersen, R., Ashenberg, A., & Shah, A. (2017). Treatment of ocular pyogenic granuloma with topical timolol. JAMA Ophthalmology, 135(4), 383–385. https://doi.org/10.1001/jamaophthalmol.2017.0110

Pagliai, K. A., & Cohen, B. A. (2004). Pyogenic granuloma in children. Pediatric Dermatology, 21(1), 10–13. https://doi.org/10.1111/j.0736-8046.2004.21102.x.

Patra, A. C., Sil, A., Ahmed, S. S., Rahaman, S., Mondal, N., Roy, S., Datta, A., Kaliyadan, F., Panda, S., Setia, M. S., Dogra, S., Khandpur, S., Hazra, A., & Das, N. K. (2022). Effectiveness and safety of 0.5% timolol solution in the treatment of pyogenic granuloma: A randomized, double-blind and placebo-controlled study. Indian Journal of Dermatology, Venereology and Leprology, 88(4), 500–508. https://doi.org/10.25259/IJDVL_565_20.

Frontier in Medical & Health Research

ISSN: (e) 3007-1607 (p) 3007-1593

Sagiv, O., Piven, I., & Rosner, M. (2013). Conjunctival pyogenic granuloma associated with intravitreal bevacizumab injection. Retinal Cases & Brief Reports, 7(3), 291–293. https://doi.org/10.1097/ICB.0b013e31828ef010.

Shi, C., Ren, Y., Feng, J., Guo, W., & Zheng, X. (2021). Conjunctival granulomatous capillary haemangioma in children: Case report and review of the literature. BMC Pediatrics, 21, 448. https://doi.org/10.1186/s12887-021-02924-5.

Tidake, P. K., Jaiswal, S., & Wagh, V. (2021). Conjunctival pyogenic granuloma – A case report. Journal of Evolution of Medical and Dental Sciences, 10(2), 111–113. https://doi.org/10.14260/jemds/2021/23

Wu, D., Qian, T., Nakao, T., Xu, J., Liu, Z., Sun, X., Chu, Y., & Hong, J. (2017). Medically uncontrolled conjunctival pyogenic granulomas: Correlation between clinical characteristics and histological findings. Oncotarget, 8(2), 2020–2024. https://doi.org/10.18632/oncotarget.13961.

Zhang, Z., Yang, Z., Pan, Q., Chen, P., & Guo, L. (2018). Clinicopathologic characteristics and the surgical outcome of conjunctival granulomas after pterygium surgery. Cornea, 37(8), 1008–1012. https://doi.org/10.1097/ICO.0000000000001647.