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Original Research Article

Microbiological profile and surgical outcomes of primary canaliculitis

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Abstract

Purpose: To evaluate the microbiological profile and surgical outcomes of primary canaliculitis.
Materials and Methods: A longitudinal study was performed between January 2020 and December 2023. The patients were diagnosed clinically with primary canaliculitis and treated in a tertiary eye hospital. The demographic variables, clinical presentation, microbiological profile, and surgical outcomes measure were analyzed in this study.
Results: Out of 34 patients, 19 were women, and 15 were men, with a mean age of 54.36. The right eye was affected in 18 patients, the left eye in 15 patients, and both eyes in one patient. The common clinical presentations were epiphora in 32 (91.42%), punctal swelling in 30 (85.71%), mucous discharge in 28 (80.00%), pain in 10 (28.57%), and conjunctival congestion in 8 (22.85%) patients. All patients underwent a canaliculotomy with expression of materials, followed by irrigation with an antibiotic solution. According to the microbiological profile, the most common organism was actinomyces, found in 32 patients. Staphylococcus species was noted in 2 patients, and granulation tissue was found in 1 patient. Post-surgical follow-ups were conducted up to 6 months, and complete resolution of symptoms and signs was observed in 33 (97.05%) patients; only 1 (3.03%) patient complained of persistent epiphora. No patient developed a recurrence of canaliculitis.
Conclusion: Canaliculotomy with expression of materials, followed by irrigation with an antibiotic solution, is the gold standard for an easy, safe, and effective procedure in cases of primary canaliculitis, with minimal postoperative complications.

Keywords: Canaliculitis, Actinomyces, Canaliculotomy, Microbiological profile, Punctal swelling.

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1. Introduction

Primary canaliculitis results in a chronic infection of the proximal part of the lacrimal pathway.[1] Canaliculitis usually presents with a red swollen appearance, pouting punctum, epiphora and mucopurulent discharge. Patients with canaliculitis are often misdiagnosed with chronic conjunctivitis, chalazion or chronic dacryocystitis,[2-4] which can cause a delay in effective treatment or even incorrect treatment.[5]

Surgery is generally considered a definitive treatment and gold standard for canaliculitis. Dilation of the punctum followed by curettage of stones is generally effective in primary canaliculitis. Topical antibiotic therapy combined with canalicular curettage, is considered the gold standard of treatment.[6]

The present study aimed to summarize the microbiological profile and surgical outcomes of primary canaliculitis. This will provide further information about the common causative organisms of this disease and help in choosing antibiotics accordingly.

2. Materials and Methods

A longitudinal study was conducted at the Ispahani Islamia Eye Institute and Hospital, Dhaka, Bangladesh, in January 2020 and December 2023. All clinically diagnosed patients with primary canaliculitis and canalicular dilatation who received surgical treatment were included in this study. The Institutional Ethics Committee approved this study.

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Canaliculitis was diagnosed based on the patient's clinical history and findings. Sac patency tests were performed in all patients. The following data were collected, including clinical presentations, microbiological and histological analyses, and postoperative follow-up on the 1st and 7th postoperative days and at regular intervals up to 6 months after surgery. All the patients were followed up after surgery up to 6 months. Patients with secondary canaliculitis or a history of previous lacrimal surgeries were excluded from this study.

The surgical procedure was brief and performed under strict aseptic precautions following local anaesthesia. Punctal dilatation was done, a canaliculotomy incision was made through a conjunctival approach parallel to the horizontal canaliculus, and curettage was performed to extract the stones from the canaliculus. The stones and discharge were sent for microbiologic culture and histological diagnosis. Patients were treated with topical antibiotic drops four times daily for 2 weeks. The type and dosage of antibiotics were prescribed based on the results of the microbiologic culture and drug sensitivity test cases.

3. Results

Thirty-five cases of primary canaliculitis in thirty-four patients underwent canaliculotomy following a 4-keratoplasty within 4 years of the study. There were 19 women and 15 men, with a mean age of 54.36 years, ranging from 32 to 75 years. There were 18 patients with only right eye involvement, 15 with only left eye involvement, and one with both eyes. Their demographic variables are summarized in **Table 1**.

Table 1: Demographic characteristics of primary canaliculitis patients

Parameter	**Results**
Mean age (years)	54.36
Range:	32 - 75
Gender	
Male	44.11%
Female	55.88%
Laterality	
Right eye	52.94%
Left eye	44.11%
Both eyes	2.94%
Affected canaliculus	
Upper	42.85%
Lower	58.82%

Table 2: The most common clinical presentation of 34 primary canaliculitis cases was summarised.

Clinical presentation	**%**
Epiphora	91.42%
Punctal swelling	85.71%
Mucous discharge	80.00%
Pain	28.57%
Conjunctival congestion	22.85%

All patients underwent surgical treatment under local anaesthesia. After canaliculotomy, the contents of the canaliculus were removed. The concretions were removed and sent for culture and histological examination. According to the microbiological profile, the most common organism was Actinomyces, found in 32 specimens, followed by Staphylococcus species, noted in 2 specimens, and granulation tissue, found in 1 specimen. The microbiological profile is summarized in **Table 3**.

Table 3: The microbiological profile of patients with canaliculitis

Isolated organism	**Numbers (%)**
Actinomyces	91.42
Staphylococcus species	5.7

The follow-up after surgery was done for up to 3 months. During follow-up, symptoms and signs were resolved completely in 33 (97.05%) patients. Only 1 (3.03%) patient complained of persistent epiphora, possibly due to canalicular scaring. No patient developed a recurrence of canaliculitis after surgery during the 6-month follow-up visits.

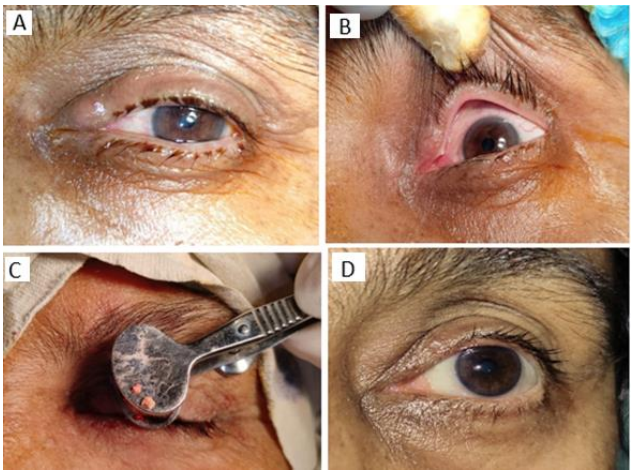

Figure 1: Photograph showing; **A:** Clinical presentation with swelling of upper canaliculus; **B:** Mucopurulent discharge from canaliculus; **C:** Canalicular curettage of concretions. (A & E) Pre-operative and postoperative appearance of upper canaliculus in the same patient.

4. Discussion

Lacrimal canaliculitis is a rare disease. For this reason, it often remains misdiagnosed. It accounts for about 2% of all patients with lacrimal disease.[1,7-9] Thorough clinical examinations are adequate for diagnosing a case of canaliculitis.[10] Even though dacryocystography and ultrasound biomicroscopy of lacrimal systems have been described by some authors for diagnosis and documentation of canaliculitis.[11] In this study, we did not find any

predisposing factors for primary canaliculitis. In a study done by Kaliki et al., four reported authors did not find any association between local factors and systemic disease.[4]

In the present study, epiphora and punctal swelling are the most common clinical presentations. A study by Zaldivar et al.[12] found epiphora to be a common symptom, and another study by Kalki et al.[4] found epiphora and swelling of the lids to be a common clinical presentation, which is similar to our study.

The mean age at the time of diagnosis was 54 years (range 32–75 years), similar to that seen in other studies. In our study, we found a female predominance, which is similar to the other studies.[5,13-15] Due to hormonal changes in old age and after menopause, there is a decrease in tear formation, which enhances bacterial growth and infections.[16] We also found a majority of infection in the lower canaliculus (58.82%), which is comparable to other author's studies.[8,13,14]

In addition to this study, concretion was identified in all cases. Actinomyces was the most common isolate organism (91.42%), followed by staphylococcus species (5.7%), and no organism was found in one patient.

Actinomyces is the major causative agent of canaliculitis.[17-20] In our present study, we also found that the most common organism was Actinomyces (91.42%), which is consistent with major clinical studies.

In this study, one microbiological result shows only granulation tissue with no organism. This may be due to the scarcity of specimens sent for biopsy.

Different treatment modalities have been described for canaliculitis.[13,17] Surgical management includes canaliculotomy with canalicular curettage, or canaliculostomy. In our study, 97.05% of patients achieved complete resolution of signs and symptoms after canaliculotomy with canalicular expression, followed by lacrimal irrigation with gentamycin injection. This finding is similar to that of Su Y et al., who reported complete resolution in all patients in their study.[21] Recurrence of canaliculitis has been reported in several studies. Xiang S et al. reported a recurrence rate of 2.8%, whereas we did not find any recurrence cases. Our technique is safe and decreases the recurrence of primary canaliculitis.

Post-surgical complications of canaliculoplasty are canalicular scarring, clear epiphora and canalicular fistula formation. In our study, postoperative care and follow-up were conducted on the 1st and 7th postoperative days (POD) and after one month, three months, and six months. After 6 months, we found that only one patient developed clear epiphora due to canalicular block, a finding similar to those reported by Kalki et al. and McKellar et al.[4,17] A high success rate was achieved with canaliculotomy and canalicular expression combined with lacrimal irrigation and gentamycin injection.

5. Conclusion

Surgical procedure, including Canaliculotomy, with an expression of concretions or stones followed by irrigation with gentamycin solution, has a very good outcome. An antibiotic solution is the primary modality of treatment and is more effective than conservative management.

6. Ethical Approval

The study received ethical clearance from the Ispahani Islamia Eye Institute & Hospital, Dhaka, Bangladesh.

7. Source of Funding

None.

8. Conflict of Interest

The authors have declared that there is no conflict of interest.

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