

Original Article

Primary canaliculitis: The incidence, clinical features, outcome and long-term epiphora after snip–punctoplasty and curettage



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Abstract

Purpose: To study the incidence, clinical features and outcome of primary canaliculitis with special reference to long-term epiphora after Snip–punctoplasty and curettage.

Methods: Single center, retrospective, telephonic questionnaire study. The medical records of patients who visited Orbit and Oculoplasty clinic, Tertiary Eye Hospital, India from 01 July 2011 to 31 June 2012 were analyzed. Records of the patients with primary canaliculitis were reviewed for clinical profile and management. Post-surgical patients thus identified were telephonically contacted in December 2012. Questionnaire was used to assess the postsurgical epiphora. Symptomatic patients were given clinic appointment, reassessed and managed.

Results: 2245 patients visited Orbit and Oculoplasty clinic during the study period. The incidence of primary canaliculitis was 1.4% (31 patients). The median age of the patients with canaliculitis was 65 years (range, 14–80 yrs). Sixteen patients were male. All cases were unilateral and four eyes showed both upper and lower canalicular involvement. The commonest clinical presentations were pus or concretion from punctum (28), mucous discharge (23), epiphora (18) and conjunctival injection (18). Three snip punctoplasty and canalicular curettage was performed in 30 of these patients. Twenty of the 25 available culture results were positive and streptococcus species was the most common isolated organism. Records revealed that five (22%) of these patients had persistence of symptoms. Twenty-three patients could be contacted telephonically. The median follow-up of these patients was 11 months. On telephonic communication we found that two (8.7%) patients had epiphora. Munk epiphora score in these patients was three and one respectively.

Conclusions: Incidence of canaliculitis was 1.4%. Most common isolate was streptococcus species. Snip–punctoplasty and curettage is a safe and efficacious modality of treatment of canaliculitis. Post-operative epiphora occurred in 8.7% patients.

Keywords: Canaliculitis, Watering, Snip, Punctoplasty, Concretions, Canaliculotomy, Canaliculus

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Introduction

Canaliculitis is inflammation of lacrimal canaliculi. It is a rare disease, accounting for 2–4% of patients with lacrimal diseases. It classically presents with symptoms of unilateral conjunctivitis, epiphora, expressible punctal discharge,

punctal or canalicular swelling, and erythema.¹ It is often misdiagnosed as chronic conjunctivitis, chronic dacryocystitis, chalazion, mucocele and blepharitis resulting in inappropriate and delayed treatment.² In addition to the delayed diagnosis, misdiagnosis often leads to unnecessary procedures such as irrigation which may push concretions into the sac

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and distal lacrimal drainage system causing dacryolith formation.¹ Previous studies demonstrated actinomyces to be the most common pathogen responsible for causing canaliculitis. However recent studies show streptococcus and staphylococcus to be the emerging most common pathogens.²⁻⁵ Although conservative management with topical antibiotics leads to transient relief from symptoms it is often associated with persistence of disease and its recurrence.⁶ Hence surgical removal of all possible concretions is considered essential for permanent cure and has been shown to have clear benefits over conservative management.^{7,8} Canaliculotomy and snip-punctoplasty allow thorough curettage and are preferred surgical options.⁹ Surgical interventions may cause lacrimal pump dysfunction and canalicular scarring leading to post-surgical epiphora.¹⁰

The aim of this study was to ascertain the incidence of primary canaliculitis and postsurgical epiphora after snip punctoplasty and curettage. We also analyzed clinical features, possible etiologies, treatment and outcome.

Patients and methods

Records of all the patients who visited Orbit and Oculoplasty clinic, Tertiary Eye Care Hospital, India, from 01 July 2011 to 31 June 2012 were analyzed. This retrospective study was approved by Institutional Review Board.

The patients who were diagnosed as canaliculitis were included in this study. Their medical records were reviewed. Data on patient's demographics, clinical features, treatment (conservative vs surgery), surgical procedure performed, microbiological report and treatment outcome were collected and analyzed. Conservative management was done by punctum dilatation and expression of concretions followed by topical ciprofloxacin eyedrops 4 times daily for one week.

Surgical management consisted of three snip-punctoplasty and curettage. Follow-up details of the patients were recorded. We recorded whether the patient was cured (complete resolution of symptoms), had persistence (no or partial relief of symptoms) or had recurrence (symptom recurrence following complete resolution).

The patients who had undergone snip-punctoplasty and curettage were then telephonically contacted in December 2012. A telephonic questionnaire was used to assess post-surgical epiphora (Table 3). We graded epiphora using Munk score.¹¹

Patients who had epiphora at the time of telephonic interview were given clinic appointment. They underwent complete adnexal (lid position, punctal position, any signs of blepharitis) and anterior segment examination (corneal surface abnormalities, tear film break-up time, Schirmer's test) to rule out other causes of epiphora. Lacrimal pump function assessment, lacrimal syringing and probing were used to establish the patency of lacrimal system and the site of any obstruction. These patients were treated and followed up six months later.

Results

Among 2245 patients with lacrimal disease, thirty-one (1.4%) patients were diagnosed and treated for primary

canaliculitis. Median duration between appearance of symptoms and diagnosis was 8 months (range, 2–24 months).

There were 16 men and 15 women. The median patient age was 65 years (range: 14–80 years). Upper punctum was involved in 14 patients, lower punctum in 13 patients and both puncta were involved in 4 patients. Pus and concretions from punctum on canalicular compression, epiphora and mucopurulent discharge were the most common presenting features of canaliculitis (Table 1). None of the patients had regurgitation on compression of lacrimal sac.

On review of records we found that all 31 patients with canaliculitis were counseled for surgery. Thirty patients gave consent and underwent snip-punctoplasty and curettage. A set protocol for surgery was followed in all these patients. Local anesthesia with 2% lidocaine mixed with epinephrine was given. Three snip-punctoplasty was performed using Vannas scissors. A curette of 1 or 2 mm in diameter then was inserted into the canaliculus through the punctum, and any concretions, granulation tissues, and mucoid debris were evacuated. Curettage was repeated until there were no further concretions or debris in the canaliculus. The material in the canaliculus was removed through the incised punctum. One patient did not give consent for surgery. He was managed by punctum dilatation and expression of concretions followed by topical ciprofloxacin.

Concretions were isolated during surgery in 27 patients and granulation tissues or mucoid discharge was observed in the remaining three patients. Gram stain, KOH, aerobic and anaerobic cultures were done. Microbiologic evaluation was performed in 25 patients and yielded positive results in 20 (80%) patients. Five cases showed no growth. Streptococcus species (60%) and staphylococcus species (10%) were the most common isolates (Table 2). Post-surgically all patients were treated with oral Amoxicillin 500 mg 3 times daily for five days and oral anti-inflammatory along with ciprofloxacin eye drops 4 times daily for one week which was changed according to the results of the culture and sensitivity report if needed.

The median follow-up was 18 weeks (range: 1–48 weeks). Seven patients (all from the surgery group) were lost to follow-up. Of 23 patients who had surgery and adequate follow-up 18 (78%) patients showed complete resolution of symptoms. Five (22%) patients showed persistence of symptoms after the first procedure. Three snip-punctoplasty and canalicular curettage was repeated in three of them. Symptoms resolved in all these patients after repeat procedure increasing the resolution rate to 21 (90%). Two patients did not give consent for repeat surgery and had persistent symptoms at last follow-up. None of our patients had recurrence. One patient who was managed conservatively

Table 1. Clinical features.

Signs and symptoms	No. of patients (n = 31)
Pus and concretions	28 (90%)
Mucous discharge	23 (74%)
Epiphora	18 (58%)
Conjunctival congestion	18 (58%)
Punctal and canalicular erythema	16 (53%)
Punctal and canalicular swelling	16 (53%)
Eyelid swelling	15 (48%)
Medial canthal pain	5 (16%)

n = number of patients.

Table 2. Microbiology.

Pathogen	No. of cases (n = 20)
<i>Streptococcus</i>	12 (60%)
<i>Staphylococcus</i>	2 (10%)
<i>Proteus vulgaris</i>	1 (5%)
<i>Actinomyces</i>	1 (5%)
<i>Klebsiella pneumoniae</i>	1 (5%)
<i>Corynebacterium</i> sp.	1 (5%)
<i>Escherichia coli</i>	1 (5%)
<i>Eikenella corrodens</i>	1 (5%)

n = number of patients.

had persistence of symptoms at 5 months (which was the last follow-up).

Twenty-three post-surgical patients could be contacted telephonically. The median follow-up was 11 months (range: 6–16 months). On telephonic interview done in December 2013, two patients reported grade 3 and grade 1 epiphora. Thus incidence of post-operative epiphora was 8.7%.

Records revealed that first patient (with grade 3 epiphora) had undergone repeat surgical procedure because of symptom persistence after first surgery. At the time of telephonic questionnaire, both patients had epiphora despite complete resolution of all other signs and symptoms and were given clinic appointment. Complete adnexal and anterior segment examination at clinic ruled out other causes of watering. Syringing was not patent and probing revealed common canalicular obstruction in the first patient and mid lower canalicular stricture in second patient. We did dacryocystorhinostomy with silicone tube intubation in first patient but second patient refused surgery. First patient had recovered fully whereas second patient continued to have persistent epiphora (grade 1) six months later.

Discussion

The incidence of primary canaliculitis among patients lacrimal disease attending our hospital was 1.4%. Pus/concretions from punctum, mucous discharge and unresolving conjunctivitis were the most common presenting clinical features. The incidence of post-surgical epiphora was 8.7%.

However 7 patients could not be contacted after the procedure and we do not know the status of epiphora in these patients.

Incidence of canaliculitis in our study is in concordance with previously reported incidence of 2–4%.^{1,3} It is a rare disorder that is often misdiagnosed and underreported. It is difficult to estimate accurate incidence of canaliculitis among general population. Low prevalence often leads to misdiagnosis of this condition.¹ Study by Pavilack and Frueh¹⁰ quotes the “lowest” misdiagnosis rate (45%) where as another study¹² has quoted this rate to be as high as 100%.

Table 3. Telephonic questionnaire.

Symptoms in affected eye	Yes	No
Is discharge present?		
Do you have watering?		
Do you have redness?		
Do you have lid swelling?		
Do you have medial canthal pain?		

In a detailed review, Freedman et al.¹ observed that there was no consensus to diagnose this condition and diagnosis is made on the basis of clinical features alone. Previous studies^{3,6,12} have based their diagnosis on findings of concretions, chronic unilateral conjunctivitis, canalicular swelling, pouting punctum, plial congestion, pericanalicular inflammation and punctal erythema. Atypical presentations of this condition such as chronic conjunctivitis, chronic dacryocystitis, chalazion, mucocele and blepharitis^{5,7,10} further add to the problem. However, clinical presentation of canaliculitis has not changed over time.¹ As Anand et al.⁵ observed, “with a high index of suspicion and a detailed work up, it is possible to identify this disease without performing more elaborate techniques”.

Canaliculitis is 2–5 times more common in females.^{2,5,9,12,13} The increased risk among women might be explained by hormonal changes during menopause, which result in impaired tear production and reduced protection against infections.⁷ Our study revealed a much higher prevalence among males than that is previously reported and almost 50% of our patients were males. This higher male prevalence might have resulted from referral bias. A similar study, also from southern India, also showed high prevalence (46%) among males.²

Streptococcus and *staphylococcus* species were most common causative organisms. Pavilack and Frueh¹⁰ and others have identified actinomycosis as the most common organism in canaliculitis. But recent studies^{2–5} show that streptococcus and staphylococcus have now evolved as new most common causative organisms and that they can also cause concretions.

Conservative management alone has high failure rate (80%) and is ineffective.⁷ Our study did not aim to compare surgical and conservative management. Only those patients (one initially and two for the repeat procedure) who did not give consent for surgery were managed conservatively. We observed that all these patients had persistence of symptoms at last follow-up. Failure of antibiotic therapy in isolation is attributed to their inability to penetrate canalicular concretions. The concretions and debris interfere with tear flow, causing a cycle of canalicular stasis and infection.¹⁰ Hence, early diagnosis and prompt surgical management are emphasized. In one of the studies intracanalicular antibiotics have been shown to obviate the need for surgery, but the average number of irrigations required per patient was 4.5 (range 1–8).¹⁴

Symptoms completely resolved in 78% of our patients after the first surgery. After a repeat procedure in three patients, final resolution rate was 90%. Previous studies also suggest that conservative management in form of curettage and antibiotics can also lead to good symptom resolution, with⁹ or without¹⁰ canaliculotomy. However Pavilack et al. reported that most patients (55%) required multiple sessions of curettage when it was done without canaliculotomy. Canaliculotomy has been found to be safe and efficacious with resolution rates between 80% and 100%.^{5–7,12}

However Lee et al.⁹ reported complete resolution in about 85% of cases with one-snip-punctoplasty and curettage. Only two of their patients (6.7%) required repeat curettage and two patients developed strictures. They claimed that although canaliculotomy had high resolution rate, it could lead to canalicular luminal narrowing or scarring, lacrimal

Table 4. Incidences of postsurgical epiphora.

	Study	Procedure	Incidence of post-surgical epiphora	n
1	Vecsei et al.	Canaliculotomy	20%	20
2	Anand et al.	Canaliculotomy	27%	15
3	Lee et al.	Snip-punctoplasty	10%	41
4	Present study	Snip-punctoplasty	8.7%	23

n = number of patients in each study.

pump dysfunction, and canicular fistula formation. They suggested that curettage through the punctum was less invasive than canaliculotomy allowing better preservation of the canicular anatomy and lacrimal duct function. Considering the findings of Lee et al. and this current study, snip punctoplasty with curettage may offer significant advantages over canaliculotomy with similar success rate and lower incidence of complications. Findings of a recent study suggest that curettage can potentially damage canicular lining and may lead to scarring. The authors conclude that “vertical canaliculotomy with retrograde expression of canicular contents” might be preferable. However, this series comprised of just eight patients and more elaborate studies need to be performed.¹⁵

There are few studies that have studied and discussed post-surgical epiphora among the patients with canaliculitis (Table 4). Vecsei et al.⁷ described epiphora after canaliculotomy in spite of patent syringing. They thought this might be caused by inflammatory irritation and surgical manipulation of the active part of lacrimal system. Anand et al.⁵ described long-term (range 6–83 months) follow-up of post-canalicular patients. They ascribed epiphora to development of nasolacrimal duct obstruction (without canicular scarring). They also mention that three of their patients with epiphora had presurgical nasolacrimal duct pathology. Their study did not reveal any direct relationship between persistent epiphora and canaliculotomy. Presurgical lacrimal pathology is possibly a risk factor for post-surgical epiphora. To best of our knowledge there is only one study that describes epiphora after snip-punctoplasty and curettage.⁹ They found preexisting nasolacrimal duct pathology and post-surgical canicular scarring to be the cause of epiphora. Our series also has long-term follow-up of patients but differs from Anand et al. because we have performed three snip-punctoplasty with curettage whereas they did canaliculotomy and curettage. Two of our patients who developed epiphora had nonpatent syringing and showed canicular obstruction. We did not find any study comparing incidence of post-surgical epiphora after canaliculotomy and snip-punctoplasty with curettage, however Table 4 suggests a much lower incidence of post-surgical epiphora after snip-punctoplasty with curettage.

The main limitation of our study was its retrospective nature. Even after best of our efforts we could not find any prospective study in canaliculitis and this area is still wide open for research. Secondly, we cannot comment on the status of pre-surgical canicular and nasolacrimal duct abnormalities as we do not perform presurgical syringing on our patients because of potential risk of pushing the concretions into the sac and distal lacrimal drainage system.

To conclude canaliculitis is a rare disease. Streptococcus and staphylococcus species have now emerged as new most common causative organisms for this condition. Surgical management with snip-punctoplasty and curettage is effective with 90% success rate. The incidence of post-surgical epiphora in our series was 8.7%. Future prospective comparative studies are needed to better define the procedure of choice for this condition with high success rate along with fewer complications.

Conflict of interest

The authors declared that there is no conflict of interest.

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