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Original Article

Comparative study of dacryocystorhinostomy with and without intraoperative application of Mitomycin C

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Abstract

Aims and objectives: To compare the outcome of dacryocystorhinostomy surgery with and without the intraoperative use of Mitomycin C.
Methods: Our study is a prospective comparative case study in which 50 patients of primary acquired nasolacrimal duct obstruction were divided on the basis of random sampling into the conventional dacryocystorhinostomy group and the Mitomycin C group in which Mitomycin C 0.2 mg/ml was used intraoperatively. Patients were followed on 1st postoperative day, 1st, 3rd, 6th weeks, 3rd and 6th months. Patient symptoms and satisfaction were noted. Patency of lacrimal passage was assessed by lacrimal syringing and tear meniscus height was recorded on each follow-up.
Results: At the end of 6 months of follow-up, 96% of patients were asymptomatic in the Mitomycin C group whereas 80% patients in the conventional group were asymptomatic. On lacrimal syringing 24 (96%) eyes had patent passage in the Mitomycin C group where as only 1 (4%) patient had complete block with regurgitation of mucopurulent fluid. In the conventional group 20 (80%) eyes had patent passage, 4 (16%) eyes had complete block with regurgitation of mucopurulent fluid and 1 (4%) eye had partially patent passage on lacrimal syringing. Out of 25 eyes, 24 had normal tear meniscus height, and 1 had high tear meniscus height in the Mitomycin C group in comparison to the conventional group in which out of 25 eyes 20 eyes had normal, 1 had moderate and 4 eyes had high tear meniscus height. Intraoperative and postoperative complications in both the groups were identical.
Conclusion: Although the difference between the two groups was not statistically significant, a distinctly higher success was achieved in patients undergoing dacryocystorhinostomy with intra operative Mitomycin C as compared to conventional dacryocystorhinostomy.

Keywords: Dacryocystorhinostomy, Mitomycin C, Lacrimal syringing

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Introduction

Epiphora and discharge secondary to nasolacrimal duct obstruction are common and troublesome problems among patients presenting to an ophthalmologist. Primary acquired nasolacrimal duct obstruction is believed to occur secondary to a chronic inflammatory process resulting in fibrosis and obliteration of the duct. Dacrocystorhinostomy is a widely accepted treatment for nasolacrimal duct obstruction whereby the occluded duct is bypassed by creating an alternative drainage route between the lacrimal sac and the nasal cavity through a bony ostium. This is most often performed through a skin incision which permits the creation of an epithelium lined tract. However failure to maintain the patency of this alternative drainage route results in the failure of this procedure. A failure rate of 11–28% with an average of 9.4% has been reported which necessitates improving the above technique.[1] The two main causes of dacrocystorhinostomy failure

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are obstruction of common canaliculus and closure of the osteotomy site by fibrosis and scar formation. Thus by inhibiting fibrous growth and subsequent scarring of the oteotomy site by using anti-proliferative agents over the anastamosed flaps and osteotomy site, the failure rate may be decreased.[1] Mitomycin C is an antibiotic alkylating agent which inhibits fibroblast proliferation and alters wound healing response leading to less fibrosis and scarring around the common canaliculus and osteotomy site.[1,2] In this paper we evaluate the effectiveness of intra operative use of mitomycin C as an adjuvant during dacryocystorhinostomy to prevent post operative fibrosis and scarring and hence decrease in the failure rate.

Materials and methods

This study was conducted in the postgraduate department of ophthalmology, Government Medical College Srinagar on 50 patients of primary acquired nasolacrimal duct obstruction. This study was approved by the ethics committee and informed consent was taken from each patient prior to surgery. Exclusion criteria included pre-saccal obstructions, acute dacryocystitis, chronic granulomatous condition, long standing chronic dacryocystitis with fibrosis of sac, chronic dacryocystitis with fistula, ectropion, entropion, nasal conditions like severe deviated nasal septum, atrophic rhinitis, and previous failure of dacrocystorhinostomy. On the basis of simple random sampling these patients were divided into two groups of 25 patients each. 25 cases underwent dacryocystorhinostomy without Mitomycin C and 25 patients of dacryocystorhinostomy with intraoperative application of Mitomycin C.

Patients were followed up for a minimum of 6 months for evaluation of subjective symptoms and objective findings. Patients were followed postoperatively on 1st day, 1st, 3rd, 6th weeks, 3rd and 6th months.

Same technique of external dacryocystorhinostomy was used in patients of both groups. 5 ml of lignocaine 2% with adrenaline 1:200,000 was infiltrated around the lacrimal sac for anesthesia and hemostasis. After anaesthetizing the nasal mucosa by topical 4% xylocaine, packing of ipsilateral nasal cavity was done with roller gauze soaked in 5 ml of 4% xylocaine with adrenaline 1:200,000. A curvilinear incision of 20 mm in length was made along the anterior lacrimal crest starting 3 mm above the level of medial palpable ligament and 3 mm medial to the medial canthus. After separating the orbicularis muscle fibers, the medial canthal ligament was divided and the lacrimal sac was separated from the fossa by blunt dissection. The periostium was elevated off and the lamina papyracea was fractured. An osteotomy of approximately 10 $\times$ 10 mm in size was created. Lacrimal sac and nasal mucosa were opened in a H fashion to form a large anterior and a small posterior flap. The posterior flap was then excised.

In the Mitomycin C group a piece of merocel surgical sponge soaked in 0.2 mg/ml of Mitomycin C was applied over osteotomy margins, undersurface of anterior flaps for 5 min. The lacrimal sac and nasal mucosal flaps were than sutured with 6/0 vicryl. Sponge was removed and normal saline irrigated through the lower punctum and over the osteotomy site. The two ends of medial palpebral ligament and incision in the orbicularis were closed with 6/0 vicryl interrupted sutures. Skin incision was closed with 6/0 vicryl subcuticular suture or interrupted sutures. Nasal pack was placed which was removed after 24 h. Postoperatively patients received systemic antibiotics and anti inflammatory drugs for 7 days .Antibiotic eye drops were advised 6 times a day for 7 days.

To evaluate the results in both groups, both symptoms and objective findings were recorded on follow up. Patient symptoms were noted and classified as asymptomatic (symptom free), improved, and no improvement. Also on follow-up tear meniscus height was recorded and lacrimal syringing was done. Tear meniscus height was recorded by using flourescein dye and graded on slit lamp as high (>1 mm), moderate (1 mm) and low (<1 mm).Syringing of the lacrimal passage was done and results were noted as passage patent, partially patent and complete block with regurgitation of fluid. Mann Whitney test was used for comparing the results of the two groups.

Results

In our study there were 50 patients who underwent dacryocystorhinostomy surgeries; 25 were in the Mitomycin C group and the remaining 25 in the conventional group. Maximum number of patients belonged to the age group 31–60 years (78%). There was no significant difference in age between the two groups ($p > 0.05$) (Table 1). There was a female preponderance in our study; 36 (72%) being female and 14 (28%) being male (Table 1). However sex distribution is comparable in both the groups.37 (74%) out of 50 cases had right sided nasolacrimal duct obstruction (Table 2). On presentation 86% (43/50) cases had watering with discharge as the chief complaint. On ENT examination out of 50 cases 15 (30%) cases had mild deviated nasal septum, 7 (28%) cases in the Mitomycin C group and 8 (30%) in the conventional group (Table 2).

Intraoperative complications occurred in 10 cases. Injury to nasal mucosa occurred in 5 (10%) cases, sac injury in 1 (2%), and severe bleeding in 4 (8%) patients, 2 each in both groups (Table 3). Intraoperative complications in the two groups were comparable. The immediate post operative complications were epistaxis and wound infection. Epistaxis occurred in 5 (10%) patients; 3 in the conventional group and 2 in the Mitomycin C group. Wound infection was seen in 2 patients in the conventional group (Table 4).

Symptomatically 24 (96%) cases in the Mitomycin C group were asymptomatic with no symptoms where as 1 (4%) had no improvement at the end of 6 months. In the conventional group 20 (80%) cases were symptom free; whereas 5 (20%) cases were symptomatic. There was no statistical significance between the two groups ($p = 0.085$) (Table 5).

At the end of 6 months in the conventional group 20 (80%) eyes had patent passage on lacrimal syringing, where as 1 (4%) eye had a partially patent passage; 4 (16%) eyes had complete block and regurgitation of mucopurulent fluid. In Mitomycin C group 24 (96%) eyes had patent passage on lacrimal syringing while only 1 (4%) eye had complete block with regurgitation of mucopurulent fluid. However no statistical significance was seen between the two groups ($p = 0.088$) (Table 5).

On assessing tear meniscus height, 24 (96%) cases in the Mitomycin C group had normal height at the end of 6 months, only 1 (4%) case had a high tear meniscus height.