Section: Ophthalmology

Original Research Article

EVALUATING EFFICACY OF NASOLACRIMAL DUCT PROBING WITH MITOMYCIN C IN TERTIARY CENTRE OF JHARKHAND

Shefa Habib[1], Vivek Kumar[2], Md Raghib Tauheed[3]

[1]*Senior Resident, SBMCH, Department of Ophthalmology, Hazaribagh, India*
[2]*Senior Resident, Department of Ophthalmology, Pjmch, Dumka, India*
[3]*Specialist Medical Officer, Department of Ophthalmology, SBMCH, Hazaribagh, India*

Received *: 03/09/2025*
Received in revised form *: 12/10/2025*
Accepted *: 01/11/2025*

Corresponding Author:
Dr. Raghib Tauheed,
Senior Resident, PJMCH, DUMKA, India.
Email: tauheedraghib@gmail.com

DOI: 10.70034/ijmedph.2025.4.353

Source of Support: Nil,
Conflict of Interest: None declared

Int J Med Pub Health
2025; 15 (4); 1970-1972

ABSTRACT

Background: NLDO is most common cause of persistence epiphora producing discomfort, visual disturbances, low grade infection, recurrent acute dacryocystitis, conjunctivitis. Study aim to evaluate role of mitomycin C in nasolacrimal duct obstruction treatment.

Materials and Methods: This prospective comparative, randomized, interventional study 60 individual &divided into 2 group of 30. Lacrimal probing irrigation with mitomycin c (1ml of 0.2mg/ml) were done in group A &only with NS in group B under LA. Patient were followed in week 2, 4,12&24. subjective improvement in symptoms &patency on syringing were evaluated.

Results: After 6 mth follow up in group A NLD was patent (60%) & in group B (40%) were symptomatically satisfied & no complication was observed.

Conclusion: Probing & irrigation with mitomycin c has high relative success &can be used as appropriate procedure for treatment management since it is simple, quick, cost-effective, day care procedure under LA, with low morbidity.

Keywords: NLDO(nasolacrimal duct obstruction)

INTRODUCTION

Nasolacrimal duct obstruction (NLDO) is a common disorder in adults that may cause intermittent or constant tearing (epiphora), blurred vision, and chronic or acute dacryocystitis.[1] It can be due to various causes such as congenital, cicatricial, infectious, traumatic, idiopathic, neoplastic, involutional, or iatrogenic.[2-4] Different surgical methods are available for NLDO treatment. Though dacryocystorhinostomy is a common treatment for NLDO, it is both invasive and bothersome procedure for.Another common method is probing which is a quick, cost-effective, simple, and safe alternative with fewer complications than surgery but problem with probing is recurrent obstruction from further fibrosis and induced trauma.[5,6] Another treatment modality is use of topical ocular medications that inhibit fibroblast proliferation such as Mitomycin C (MMC).It is a chemotherapeutic antibiotic that has been used as an adjunct to prevent recurrence in various other disease i.e ,after pterygium surgery and glaucoma surgery.[7] Several studies have reported that topical MMC is also effective in squamous cell carcinoma treatment8 conjunctival corneal intraepithelial neoplasia primary acquired melanosis and conjunctival melanoma treatment.[9-11] Utility of MMC for lacrimal probing to treat NLDO has been investigated in a few studies. Although a preliminary study,[12] it showed that MMC, as an adjuvant for nasolacrimal duct probing, can improve both subjective and objective outcomes, that study was done only on 32 patients and included no control group for comparison. In this case, a comparative study with an adequately large sample size would have been needed to conclusively determine the effect of MMC as an adjunct for a nasolacrimal probing procedure. Given this background, we performed the present study to confirm the effect of using a low dose of MMC as an adjunct for nasolacrimal duct probing to treat adults with NLDO.

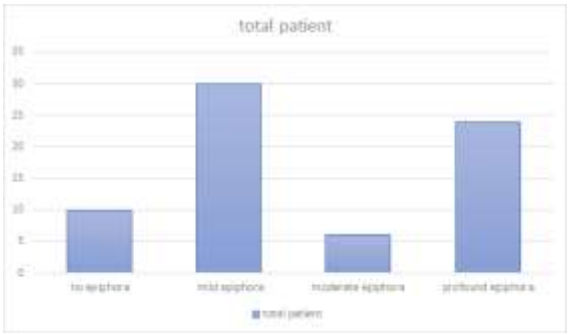
MATERIALS AND METHODS

This is a prospective comparative, randomised, interventional study that included 60individual& divided into 2 group of 30. The study was conducted at the Regional institute of ophthalmology of Rajendra institute of medical science, Ranchi, Jharkhand between August 2019 to January 2020.Diagnosis ofNLDO was confirmed through the patient's ophthalmichistory, which includes symptoms of discharge, epiphora, and chronic dacryocystitis. Slit-lamp examination was done to rule out any disorders of the ocularsurface and by eyelid examination for possible laxity,misdirected lashes and proper closure. Lacrimal irrigation with saline solution showedthe location of the obstruction. We excluded patients witha previous history of surgical intervention, diabetes mellitus,eye trauma, nasal structural abnormalities, lacrimalsystem tumours, severe atrophic rhinitis. We also excluded those with epiphoradue to wind or cold, nasal cavity pathologies, eyeliddeformities, congenital epiphora, or lacrimal pump dysfunction.

In group A, irrigation was carried out under topical anaesthesia by MMC (1ml of 0.2 mg/mL) into the duct with a nasal pack for 10 minutes and patients were asked not to swallow the solution followed by gargling with water was provided to clear any residual MMC. Then theocular surface wasirrigated with normal saline. While in group B, irrigation was carried out by use ofonly normal saline mixed with betadine.Patients were treated with antibiotic eyedrop & ointment and topical steroid (tobramycin) four times daily for a period of7 to 14 days. If patency was lost, the procedure was repeated2 months after the first treatment. The patients were followed up at 2 weeks and 1, 3& 6 months after the procedure. During every check-up, patencywas confirmed by irrigation. Slit-lamp examination of the caruncle, punctum, cornea, conjunctiva, iris, lens, and anterior chamber and nasal mucosa examination were done to look for anyside effects.

RESULTS

In 60 patients of the study, none were lost to follow-up; thus, the number of patients who finished the study was 60. There were no demographic differences (age, gender distribution, height, weight, BMI, and duration of the operation) between the two study groups. Of the 60 patients after 6 months of follow-up, 10 patients (16.66%) had an outcome of no watering, 18 patients (30%) had mild watering, 6patients (13.3%) had moderate watering, and 24 patients (40%) still suffered from severe watering after probing. Therewere significant differences between the two study groups in patient's post-probing epiphora grades during 6 months of follow-up.



There were statistically significant differences between the two study groups in patency rates at any follow-up.

Table 1

Symptoms after 6 months	Group A -with MMC	Group B-with NS
No watering	6(20%)	2(6.66%)
Mild watering	9(30%	7(23.3%)
Moderate watering	3(10%)	3(10%
Profound watering	12(40%)	18(60%)

Statistically significant differences between two study groups in overallsymptomatic relief with no complications:

Table 2

	Success rate	Failure rate	P VALUE
GROUP A	60%	40%	(0.006)
GROUP B	40%	60%	

The overall success rate of probing with MMC was (60%), which was significantly higher than the procedure with normal saline (40%) (p=0.006). No significant side effects of probing with MMC were noted after 6 months of follow-up. Analysis of the success rate of probing in different sexes also showed no relationship in the two groups. No significant association between the side of obstruction (proximal, distal, right, and left) with the success rate of probing were found.

DISCUSSION

In this study, it confirmed the efficacy of MMC in decreasing the symptom of epiphora after probing in NLDO. Our results demonstrated that the overall success rates of probing at the end of the study were 60% and 40% in the cases and controls,respectively. We also noticed that the patency rate was significantly better in patients treated with MMC

during probing than in those treated with normal saline for the whole study period. Although the rate of moderate watering was not significantly different between the two study groups during the 6 months of follow-up, this rate was lower in cases than in controls. According to the results of this study, the failure rate of probing increased with age. In addition, this study indicated no significant side effects of probing with MMC after 6 months of follow-up. MMC is a chemotherapeutic antibiotic isolated from Streptomyces caespitosus. Its mode of action is to mimic the effects of ionizing radiation. MMC inhibits DNA synthesis in all phases of the cell cycle because of cross-linkage between the DNA base pairs adenine and guanine. MMC also induces breakage of single-stranded DNA. Despite its non-cell cycle-specific action, rapidly dividing cells are rather sensitive to these effects.[7-9] Moreover, MMC prevents fibroblast proliferation and modifies the wound healing response, leading to less scarring and fibrosis around the common osteotomy and canaliculus site.[10,11] In a similar study, Tsai et al,[12] reported full absence of watering in 25%, moderate improvement in 47%, mild improvement in 11%, and no improvement in 17% of patients with NLDO who were treated by probing with MMC after 9 months of follow-up. Tsai et al. performed a noncomparative study, in which no control group of probing with saline was included. In that study, the overall patency rate after probing with MMC was 89%. Likewise, the overall improvement after probing with MMC in another study from Sinha et al,[13] was 65% and the patency rate was 30% after 3 months of follow-up. Their findings are similar to ours in that probing with MMC was significantly better than probing with saline.[14] A similar study by Choontanom,[15] showed that a dose of 0.2 mg/mL MMC significantly reduced the epiphora symptom after probing in NLDO compared with that in patients in the normal saline solution group. On the basis of these findings, we contend that nasolacrimal probing with MMC can induce subjective improvement in epiphora with regard to a good success rate for a period of less than 1 year. It can be used as appropriate procedure for treatment management since it is simple, quick, costeffective, day care procedure under local anaesthesia, with low morbidity.

CONCLUSION

Probing & irrigation with mitomycin c has high relative success &can be used as appropriate procedure for treatment management since it is simple, quick, cost-effective, day care procedure under LA, with low morbidity.

REFERENCES

1. Ali MJ. Lacrimal disorders and surgery: historical perspectives.In: Ali MJ, ed. Principles and Practice of Lacrimal Surgery. NewDelhi:Springer,2015;1-8.
2. Sobel RK, Carter KD, Allen RC. Bilateral lacrimal drainage obstructionand its association with secondary causes. OphthalPlastReconstrSurg2014;30:152-6.
3. Kamal S, Ali MJ. Primary Acquired Nasolacrimal Duct Obstruction(PANDO) and Secondary Acquired Lacrimal Duct Obstructions(SALDO). In: Ali MJ, ed. Principles and Practice of LacrimalSurgery. New Delhi:Springer,2015;133-41.
4. Nemet AY, Vinker S. Associated morbidity of nasolacrimal ductobstruction--a large community based case-control study. GraefesArch Clin Exp Ophthalmol2014;252:125-30.
5. Baig R, Khan QA, Ahmad K. Long-term outcome of primary externaldacryocystorhinostomy. J Coll Physicians Surg Pak2013;23:641-4.
6. Ekinci M, Çağatay HH, Oba ME, Yazar Z, Kaplan A, Gökçe G, etal. The long-term follow-up results of external dacryocystorhinostomyskin incision scar with "W incision". Orbit 2013;32:349-55.
7. Kaufman SC, Jacobs DS, Lee WB, Deng SX, Rosenblatt MI,Shtein RM. Options and adjuvants in surgery for pterygium: a reportby the American Academy of Ophthalmology. Ophthalmology2013;120:201-8.
8. Kashkouli MB, Heirati A, Pakdel F, Kiavash V, Naseripour M,Aghamohammadi F. Long-term follow-up of invasive ocular surfacesquamous cell carcinoma treated with excision, cryotherapy,and topical mitomycin C. Graefes Arch Clin Exp Ophthalmol2012. [Epub ahead of print]
9. Birkholz ES, Goins KM, Sutphin JE, Kitzmann AS, Wagoner MD.Treatment of ocular surface squamous cell intraepithelial neoplasiawith and without mitomycin C. Cornea 2011;30:37-41.
10. Lichtinger A, Pe'er J, Frucht-Pery J, Solomon A. Limbal stem celldeficiency after topical mitomycin C therapy for primary acquiredmelanosis with atypia. Ophthalmology 2010;117:431-7.
11. Lim LA, Madigan MC, Conway RM. Conjunctival melanoma: areview of conceptual and treatment advances. Clin Ophthalmol2013;6:52131.
12. Tsai CC, Kau HC, Kao SC, Hsu WM, Liu JH. Efficacy of probingthe nasolacrimal duct with adjunctive Mitomycin-C for epiphorain adults. Ophthalmology 2002;109:172-4.
13. Sinha MK, Bajaj MS, Pushker N, Ghose S, Chandra M. Efficacyof probing with mitomycin-C in adults with primary acquired nasolacrimalduct obstruction. J OculPharmacolTher2013;29:353-5.
14. Ghobadifar MA, Degani N, Dezhkam I, Rezaei N. Probing withmitomycin-C in adults with nasolacrimal duct obstruction. J OculPharmacolTher2013;29:515.
15. Choontanom R. Probing and syringing with 3% solution of NaCland/or 0.2 mg/ml mitomycin-C in nasolacrimal duct obstructionpatients. J Med Assoc Thai 2010;93 Suppl.