

COMPARISON BETWEEN CONVENTIONAL DCR AND DCR AUGMENTED WITH MITOMYCIN-CWaseem Raja¹, Mohd. Ayaz Bhat², Mahrukh³¹Consultant, Department of Ophthalmology, J and K Health Services, Kashmir.²Consultant, Department of Ophthalmology, J and K Health Services, Kashmir.³Medical Officer, J and J Health Services, Kashmir.**ABSTRACT****BACKGROUND**

Dacryocystorhinostomy (DCR) is done for management of epiphora due to nasolacrimal duct obstruction. Common causes of DCR failure are fibrous tissue growth, scarring and granulation tissue formation which obstructs the new drainage channel formed after conventional DCR surgery. Mitomycin-C is an anti-proliferative agent and may enhance the result of DCR by inhibiting fibrous tissue proliferation.

MATERIALS AND METHODS

A prospective randomized comparative study of one-year duration was done in the Department of Ophthalmology, District Hospital, Pulwama, Kashmir (J and K) India. A total of 100 patients of acquired nasolacrimal duct obstruction were enrolled and divided randomly into two groups, 50 of patients in each group. One group had undergone conventional external DCR operation and other group was treated with DCR surgery with intraoperative mitomycin-C application, in this, 0.2mg/ml MMC was applied at flaps and osteotomy site. Patients were reviewed after 1 week, 1 month, 3 months and 6 months postoperatively. The results of DCR surgeries were evaluated by observation of different parameters such as height of tear of meniscus and patency of the nasolacrimal passage.

RESULTS

In our study, we have observed that majority of cases were in 21-30 years age group with female preponderance (male vs female; 35% vs 75%). Major difficulties encountered during surgery and postoperatively were almost identical in both the groups. There was no case of abnormal mucosal bleeding, mucosal necrosis, delayed wound healing in patients who underwent DCR with mitomycin C use. Post-operative care and follow up were done identically in both the groups. It was seen that a total success rate of 86.25% was achieved in conventional group where as 97.50% success was achieved in MMC group at the end of 6 months, The difference in success rate was statistically significant ($p=0.017$). In case of scar prone conditions like lacrimal fistula mitomycin-C use has shown to be efficacious in maintaining patency of the system after surgery.

CONCLUSION

Intraoperative mitomycin-C application is effective in increasing the success rate of DCR surgery in standard nasolacrimal duct obstruction, and no significant complications resulted from its use. Use of intraoperative mitomycin-C can be considered safe and simple but very effective modification of conventional external DCR.

KEYWORDS

DCR, Mitomycin-C, Patency

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BACKGROUND

Dacryocystitis is the infection of lacrimal sac most often as a result of obstruction of nasolacrimal duct.¹ This disease may be acute or chronic. Watering from the eye is the presenting complaint of chronic dacryocystitis.² Most ophthalmic surgeons accept dacryocystorhinostomy (DCR) as a highly successful procedure in managing epiphora due to nasolacrimal duct obstruction. From previous studies, it

appears that the success rate for this procedure is about 90%.³⁻⁵ The two most frequent causes of DCR failure are obstruction of the common canaliculus and closure of the osteotomy site.⁶⁻⁸ Thus, if we can inhibit fibrous tissue growth and scarring by applying ant proliferative agents over the anastomosed flaps and osteotomy site, the failure rate may be decreased.

Mitomycin C, an ant proliferative agent, has been widely used in pterygium excision and trabeculectomy with favourable results.^{9,10}

MATERIALS AND METHODS

Here we did a prospective randomized comparative study of one-year duration in the Department of Ophthalmology, District Hospital, Pulwama Kashmir, Jammu and Kashmir India. A total of 100 patients of acquired nasolacrimal duct obstruction were enrolled and divided randomly into two groups, 50 of patients in each group. Conditions like

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Obstruction prior to lacrimal sac level, acute dacryocystitis, chronic granulomatous conditions of lacrimal sac, malignancy of lacrimal sac, long standing chronic dacryocystitis with fibrosis of lacrimal sac in very old individuals, ENT pathologies etc were excluded. One group had undergone conventional DCR operation and other group was treated with DCR with intraoperative mitomycin C application. The surgical procedure in both the groups were similar, except the use of mitomycin C. A piece of cotton soaked with 0.2 mg/ml mitomycin C was applied to the osteotomy site for 5 minutes. Patients were reviewed postoperatively at 1 week, 1 month, 3 month and 6 months. Analysis of the result was performed using standard statistical methods. Data were analysed using SPSS and Graph pad Prism. Student's t test was employed to compare the means of two independent groups. The Chi-square test was used to compare the frequency distributions of categorical variables across groups. Fisher's exact (two tailed) probability was computed when the requirements for the Chi-square (χ^2) were not met.

RESULTS

Out of total 100 study patient, 75 cases (75%) were female and 25.

Sex	n	%
Male	25	25%
Female	75	(75%)
Total	100	100%

Table 1

Cases (25%) were male. The mean age in one group (conventional) 38.83 ± 9.92 years and in MMC group is 35.73 ± 12.58 years.

DISCUSSION

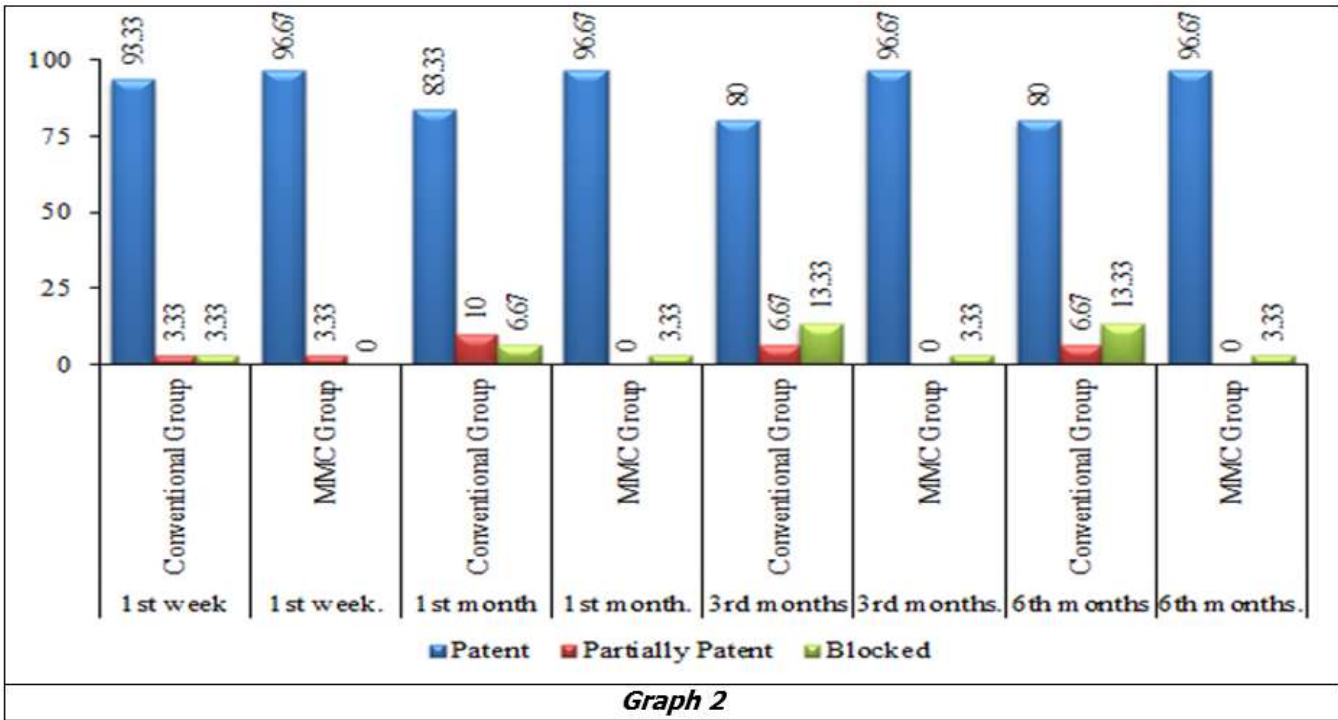
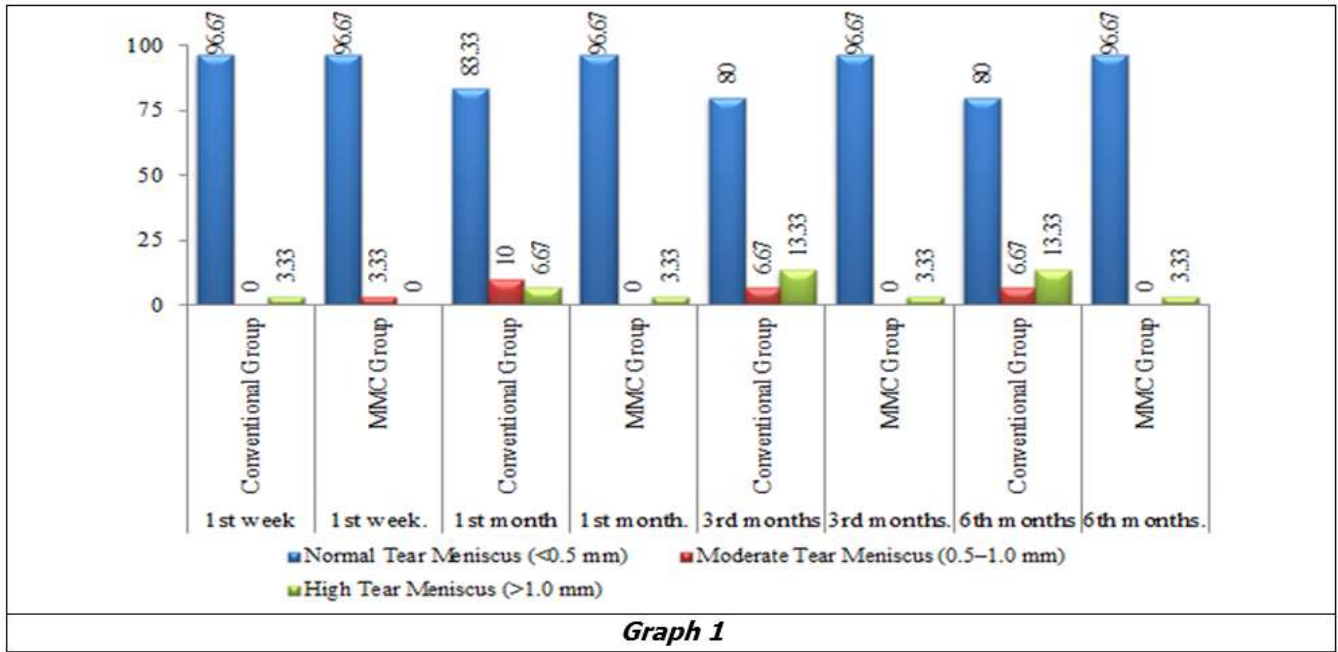
Dacryocystorhinostomy has been accepted as a highly successful procedure in dealing with epiphora from nasolacrimal duct obstruction. Dacryocystitis, the inflammation of lacrimal sac is the most common cause of lacrimal passage obstruction.¹¹ It may be congenital or acquired. Acquired variety presents as acute or chronic dacryocystitis. Chronic dacryocystitis is the most common cause of epiphora (about 87%),¹² affecting women three times more than men.^{13,14} Medical treatment with topical antibiotic administration and massage over lacrimal sac area is helpful for most cases of congenital dacryocystitis within first 12 months of age.¹⁵ Small number of the patients with catarrhal type of chronic dacryocystitis respond to broad spectrum antibiotics both locally and systemically. Syringing of lacrimal passage with antibiotic solution, pressure syringing etc. may be helpful in some cases. But definitive treatment of chronic dacryocystitis in adult is dacryocystorhinostomy. Success rate of external DCR has been reported between 80-99% and average failure rate as reported in literature is 9.4%.¹⁶ Failure is generally defined as having symptoms of excessive tearing with the inability to irrigate. Mc Pherson and Egelston noted that three out of

seven patients in their study who underwent a second operation were found to have dense scar tissue present at the osteotomy site.¹⁷ Allen and Berlin in 1989 reported 20 failed DCRs with the postoperative obstruction distal to common canaliculus. In their study, there were 13 cases with cicatricial closure of rhinostomy with granulation tissue and three cases with scarring of the osteotomy to the turbinate or septum. Mc Lachlan et al, proposed the higher incidence of common canaliculus obstructions as cause of DCR failures.¹⁸ From the literature described above, we see that fibrous tissue growth, scarring and granulation tissue formation during the healing process will decrease or compromise surface area of osteotomy site leading to surgical failure. The healing process also promote adhesion of osteotomy to the turbinate and septum, or induce obstruction of the common canaliculus. Linberg et al showed that an appropriately large osteotomy made during surgery can narrow down to a final size of approximately 2 mm due to tissue growth and scarring.¹⁹ Thus if we can inhibit fibrous tissue growth and scarring by applying antiproliferative agents over the anastomosed flaps and osteotomy site, failure may be decreased. Mitomycin C, which is an anticancer agent has ability to significantly suppress fibrosis and vascular in growth after exposure to filtration site of trabeculectomy and also in preventing recurrence after pterygium excision. Thus in DCR surgery application of mitomycin C at the anastomotic flap and osteotomy site should reduce the fibrous adhesion between the osteotomy site and the nasal septum as well as inhibit scarring around the opening of common canaliculus. Hence this prospective randomized study was undertaken to evaluate the role of mitomycin C in maintaining post-operative patency of nasolacrimal passage after DCR for primary acquired duct obstruction or chronic dacryocystitis.

The study was done in Department of Ophthalmology, District Hospital, Pulwama (Jammu and Kashmir) India for a period of 1 year. A total of 100 cases were randomized into two groups using simple random sampling technique. Conventional group included external dacryocystorhinostomy without MMC (n=50) and MMC group included external dacryocystorhinostomy with intraoperative mitomycin C (n=50). In our study we have observed that majority of cases were in 21-30 years age group with female preponderance (male vs. female; 35% Vs. 75%). Major difficulties encountered during surgery and postoperatively were almost identical in both the groups. There was no case of abnormal mucosal bleeding, mucosal necrosis, delayed wound healing in patients which underwent DCR with mitomycin-C use. Post-operative care and follow up were done identically in both the groups. It was seen that a total success rate of 86.25% was achieved in conventional group where as 97.50% success was achieved in MMC group. In case of scar prone conditions like lacrimal fistula mitomycin-c use has shown to be efficacious in maintaining patency of the system after surgery. Ahmed SS et al conducted a prospective randomised controlled study taking 44 eyes with primary nasolacrimal duct obstruction to evaluate the long term result of intraoperative

mitomycin-C application in DCR surgery. They found that satisfaction rate in the mitomycin-C group was 95.45% while in conventional group, it was 72.72% 30. Another study conducted by Rahman A et al taking 90 patients to evaluate the success rate and complications of intraoperative mitomycin-C in DCR surgery found that success rate in the procedure was 97.77%. They concluded that intraoperative mitomycin-C application in external DCR is safe, effective and helps to achieve good result in DCR surgery.²⁰ Yildirim

C et al in a prospective randomized controlled study found that success rate in MMC group was 95% compared with 85% in the control group.²¹ Ari S, et al, conducted a prospective, double masked, randomised controlled trial on 100 Turkish patients to assess the efficacy of intraoperative adjunctive MMC treatment in external DCR surgery. The success rate was significantly greater in the MMC group (96%) than the control group (84%).²²



CONCLUSION

Distinctly higher success rates have been achieved in patients undergoing DCR with intra-operative MMC as compared to patients undergoing conventional DCR. Utilizing the anti-fibroblastic activity of mitomycin C in preventing scarring at osteotomy site in external DCR, can go a long way in preventing the blockage and maintaining the postoperative patency of passages. MMC is a useful adjunct to external DCR in conditions having high risk for scarring and failure like lacrimal fistula. Use of intraoperative Mitomycin C can thus be considered safe and simple but very effective modification of conventional external DCR.

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