Original Article

Role of Mitomycin C Probing and Syringing in Failed DCR (Dacrocystorhinostomy) Patients

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Purpose: To evaluate the role of 0.01% (0.1 mg/ml) Mitomycin C probing followed by syringing with 0.1% MMC in failed DCR patients.

Study Design: Prospective cohort study.

Place and Duration of Study: from Jan 2014 to Dec 2015 at Department of Ophthalmology, Khyber Teaching Hospital Peshawar.

Material and Methods: Thirty (30) patients, 19 females and 11 males of failed DCR were included in the study. Patients with symptoms of epiphora and positive/doubtful regurgitation test were included in the study. Exclusion criteria were traumatic chronic dacryocysitis, history of failed DCR for more than two weeks and nasal abnormality. Probing with Mitomycin C followed by syringing and irrigation were done at presentation, at 6 weeks interval, at 3 months interval and 6 months interval if needed. The procedure was declared successful if saline came into the nose or throat. The patient was prescribed topical antibiotic drops, saline nasal drops and saline gargles. Each time ENT consultation was done to see the side effects of mitomycin in throat and nose.

Results: All of the thirty patients included in the study showed improvement in NLD patency after probing followed by syringing with MMC when failed DCR was detected within first fifteen days of DCR.

Conclusion: If failed DCR patients are detected within fifteen days after surgery, probing and syringing done with mitomycin C improves the patency of NLD system.

Keywords: **D**acrocystorhinostomy, mitomycin c, probing and syringing of lacrimal sac.

DCR is done for epiphora due to nasolacrimal duct obstruction. If epiphora and conjunctivitis persists after DCR surgery it is a troublesome situation for patients. The reported failure rate after primary DCR procedure is from 11 to 28%[1].

Various options are used to manage these patients. These include long-term medications to surgical intervention. After a successful patent DCR operation, the causes of later failure include fibrosis at canalicular or osteotomy site[2,3]. Even intubation of lacrimal drainage system can have granulation tissue formation[4,5]. To prevent this complication some surgeons use anti fibrotic agent Mitomycin C at these sites[6,7]. Mitomycin C is a chemotherapeutic agent, which prevents fibrosis by inhibiting collagen synthesis. Mitomycin was first used in ophthalmology in 1969 in recurrent pterygium. Later, in filtration and DCR to prevent scarring[8]. Various types of application and concentrations have been used with different routes. These include cotton tip soaked in MMC application to nasal and lacrimal mucosa followed by

irrigation with normal saline. Kamal et al, used the technique of intramucosal injection of 0.1ml of 0.02% MMC along the ostium called COS MMC[9].

Long-term medication is just symptomatic treatment with many side effects. Similarly, re-surgery does not suit the surgeon or the patient. If failure of DCR is detected in first fifteen days of surgery, it is possible to treat by simple ways comparatively. In this study, we have used a new technique of MMC probing followed by MMC syringing. The role and effectiveness of mitomycin C probing and syringing is highlighted.

MATERIAL AND METHODS

This study was done in Eye B unit of KTH/KMC. Exclusion criteria were traumatic chronic dacryocystitis, history of failed DCR more than two weeks and nasal abnormality. A total of 30 patients with symptoms of epiphora and positive/doubtful regurgitation test were included in the study. Patients were taken into OT. Patient's consent was taken and procedure was explained. Under topical anesthesia syringing with diluted 0.5% lignocaine (one ml of 2% xylocaine with four ml saline) done to confirm the blockage or failure of DCR. Probing was done with lacrimal probe soaked in 0.01% MMC. This was followed by syringing and irrigation with 0.1% MMC mixed saline for ten minutes. After ten minutes interval the naso-lacrimal duct drainage system was irrigated with normal saline. This process was repeated at 6 weeks, three months and six months interval. The procedure was declared successful if saline came into the nose or throat. The patient was prescribed topical antibiotic drops, saline nasal drops and saline gargles. Each time ENT consultation was done to see the side effects of mitomycin in throat and nose. As far as level of obstruction in different cases was concerned, our objective was failure at any site.

RESULTS

The results were classified in four phases (Table 1).

Phase 1

A total thirty patients of recent DCR were identified and confirmed by syringing and irrigation method. In all these patients on presentation probing and syringing with 0.01% MMC solution were done. The result showed that 17 NLD were fully patent and 13 were partially patent.

Phase 2

The technique was repeated at 6 weeks and it was found that 15 NLD were fully patent, 10 NLD had partial and 5 NLD had complete block. The procedure or technique of probing and irrigation with mitomycin was repeated in all patients irrespective of patency. There were 20 NLD fully patent and 10 partially patent.

Phase 3

After three months interval again the patency was checked. 18/30 patients had fully patent drainage system, 11/30 had partial and one completely blocked passage. Probing and syringing with Mitomycin was done. All were patent with 19/30 fully patent and 11/30 partial.

Phase 4

The procedure was repeated after six months and it was found that 20/30 patients had patent NLD and 10/30 patients had partial blockage. (Partial means some fluid into throat or nose and some fluid through upper or lower punctum). All cases were followed for six months from date of patency noted.

Table 1: Summary of the procedure and results.

	Syringing before Probing			Syringing with MMC after Probing with MMC		
	Patency Partial	Patency Total	Blocked	Patency Partial	Patency Total	Blocked
At Presentation	0	0	30 (100%)	13 (43%)	17 (57%)	0
At 6 Weeks	10 (33%)	15 (50%)	5 (17%)	10 (33%)	20 (67%)	0
At 3 Months	11 (37%)	18 (60%)	1 (03%)	11 (37%)	19 (63%)	0
At 6 Months	10 (33%)	20 (67%)	0	10 (33%)	20 (67%)	0

DISCUSSION

DCR with or without intubation of drainage system is choice of primary surgical standard procedure for NLD obstruction for age 7 years and above. In spite of all surgical available techniques there is an average failure rate of 9.4%[10]. The causes of failure may help the surgeon in planning to exclude causes of failure before or during operation. The major failure rate reported by Wilham and Wulc is 32.21%. They reported the cause of failure as malposition of window and scarring by anterior ethmoid air cells[11].

Many authors have noted that the cause of failure is scarring or fibrosis at canalicular system, osteotomy site or nasal septum site[12,13,14]. Performing second surgery Pico found an occluding membrane at the site of drainage channel[15]. Scarring is one of the key factors in failure of naso lacrimal drainage apparatus. Various authors started to use MMC for prevention of failure in primary surgery.

As far as usage is concerned, You and Fang used different concentration of mitomycin as 0.02% (0.2 mg/ml) MMC in one group and 0.05% (0.5 mg/ml) MMC in other group[16]. There was no statistical significance of dose used. However, MMC increased the success rate over traditional DCR.

Deka et al used intraoperative MMC with 95% success rate[17] and Mukhtar et al reported 97.5% success rate[6]. Postoperative MMC soaked cotton ball swab was used intranasally by Henson et al with success rate of 92.8%[18]. Feng CT al in their Meta analysis stated that intra operative use of MMC is safe and increase the success rate after both primary DCR and revision endo laser DCR[16]. Gupta et al did re surgical intervention in failed DCR patients with success rate of 92.4%[19].

In our study it was confirmed that MMC 0.01% (0.1mg/ml) helps in patency even after post operative failure. As far as dose and concentration is concerned, various authors have used different concentration of MMC in various procedure of DCR to enhance the success rate of surgery.

The dose concentration used as, 0.02% MMC and 0.05% MMC by You and Fang respectively.[16] 0.05% MMC and 0.4% MMC by Deka et al,[17] 0.02%MMC by Mukhter et al[6]. Various concentration for different time period were used. The minimum effective concentration 0.2 mg/ml for 3 minutes is more effective while in our study 0.01% (0.1 mg/ml) was equally effective. In another study, the dose of 0.02 to 0.04% for 5-30 minutes was successfully used with no complication[20].

The Route used was intra operative by You and Feng[16], intra operative by Deka et al[17], Circum-ostial inj of mitomycian (COS-MMC) on nasal mucosa by Ari et al[21]. In our study it was 0.01% (0.1 mg/ml). Route was probing with MMC, syringing and irrigation with 0.01% MMC.

In various studies the success rate in Qadir M et al was 96% with mitomycin C vs 80% without mitomycin.[22] In Mukhter et al study, by using 0.02% (0.2 mg/ml) MMC success was 97.5%,[6] in Deka et al 0.04% (0.4 mg/ml) it was 95%[17]. In Kamal et al all the success rate was 97.3%.[8] Otolaryngologist (ENT surgeon) used intraoperative mitomycin C during endoscopic DCR surgery at 93.3% success rate vs 78.3% without mitomycin C[23]. They all used MMC as intra operative in primary procedure while in our study the concentration used was 0.01% (0.1 mg/ml) MMC after failure of surgery. The success rate was 100% if failed DCR was detected in first two weeks of surgery.

CONCLUSION

If failed DCR patients are detected in first fifteen days after surgery, probing and syringing is done with mitomycin C. It improves the patency of NLD system.

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