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Endonasal Dacryocystorhinostomy with Mitomycin C Application

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Abstract
Objective: Present study was designed to compare the outcome results of endonasal endoscopic dacryocystrhinostomy (DCR) with or without Mitomycin C (MMC) application.
Methods: 80 patients with nasolacrimal duct obstruction. They were divided into two equal groups according to the planned surgical intervention technique**.**
Group A: Included 40 patients with nasolacrimal duct (NLD) obstruction who underwent endonasal endoscopic DCR with (MMC) application**.**
Group B: Included 40 patients with NLD obstruction who underwent endonasal endoscopic DCR without (MMC) application. All cases underwent full history taking, clinical examination, laboratory investigations; surgical intervention and follow up for 6 months postoperatively.
Results: In the present study, group(A) DCR with MMC application it was found that the success rate was reported in 37 cases (92.5%) and failure in 3 cases (7.5%); while in group (B) DCR without MMC application it was found that the success rate was reported in 33 cases (82.5%) and failure in 7 cases (17%).
Conclusion: Results of the present study revealed that, endoscopic DCR with MMC application had a comparable success rate over endoscopic dacryocystrhinostomy (DCR) without MMC application and had advantages of having a higher success rate, less intraoperative and postoperative complication.

Keywords: Endoscopic dacryocystrhinostomy (DCR), Mitomycin C (MMC) application

Introduction
Mitomycin C (MMC) inhibits DNA synthesis by acting in the late G. (Gap) and early S (synthesis) phase of the cycle to cross link DNA. (Singh *et al* 1988) [1]. This principle has Found applications in endonasal dacryocystrhinostomy (DCR) surgery to increase the success rate of DCR and it may also prove useful in reoperations for DCR failures. Thus intraoperative use of MMC in canaliculo-DCR may increase success rate of this operation. (Jeong *et al* 1999) [2].
Aim of the work The aim of this work is to study and evaluate the effect of Mitomycin C (MMC) on the patency of the dacryocystorhinostomy (DCR) ostium.
Patients and methods; Eighty patients complaining of epiphora were randomly picked up from the Ophthalmology Clinic and Department of Al-Azhar University Hospital (Assiut), through four years period, extending from April 2014 to April 2018. All patients were subjected to the following: Inclusion criteria; Young patient with chronic Dacryocystitis, lacrimal absess, good intranasal anatomy and failed external DCR. Exclusion criteria; Acute Dacryocystitis, lacrimal sac tumours, deviated nasal septum, nasal polyps or tumours, atrophic rhinitis, prolonged bleeding time, clotting time and prothrombin time.

Statistical analysis
The data were analysed to compare the means of normally distributed variables between groups, the independent (t) test was performed and $\chi 2$ test or Fisher's exact test was used to determine the distribution of categorical variables between the two groups.

Results
There was statistically significant difference of success rate in endoscopic DCR with (MMC) application group (A) in comparison to endoscopic DCR without (MMC) application group (B) (2.5% vs82.5% respectively).

Table 1: Success rate in both groups.

Endoscopic DCR	with (MMC) application group (A)		without (MMC) application group (B)		P. value
	N	%	N	%	
Succeeded	37	92.5%	33	82.5%	0.02*
Failed	3	7.5%	7	17.5%	

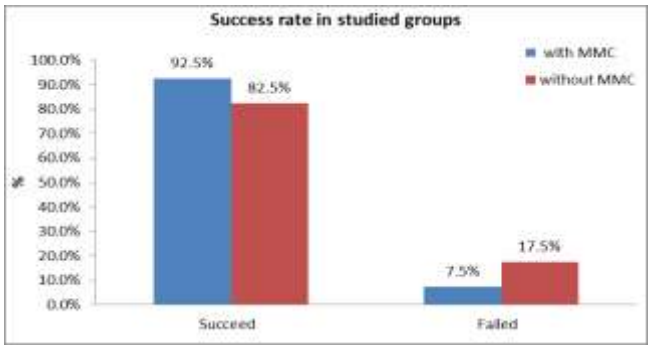

Fig 1: Success rate in both groups

Table 2: Intraoperative complications in both groups

Endoscopic DCR	with (MMC) application group(A)		without (MMC) application group(B)		P. value
	N	%	N	%	
None	37	92.5%	28	70.0%	0.2
Prolapse of Per orbital fat	2	5.0%	8	20.0%	0.05*
Damage of the sac wall	0	0.0%	4	10.0%	0.04*
Mucosal necrosis	1	2.5%	0	0.0%	0.3

There was statistically significant difference between endoscopic DCR with (MMC) application group (A) and endoscopic DCR without (MMC) application group (B) in prolapse of per orbital fat with (P. value < 0.05) and also in damage of the sac wall with (P. value < 0.04).

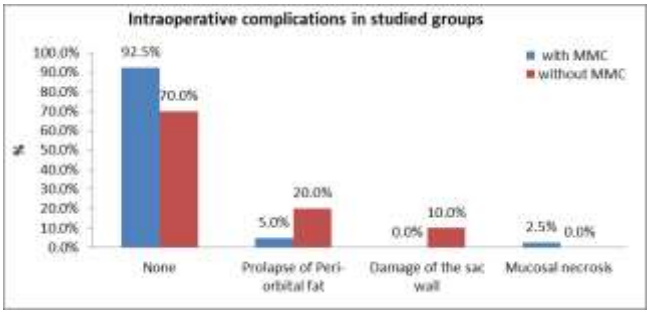

Fig 2: Intraoperative complications in both groups

Table 3: Postoperative complications in both groups.

Endoscopic DCR	with MMC application group (A)		without MMC application group (B)		P. value
	N	%	N	%	
None	24	60.0%	20	50.0%	0.5
Mild epistaxis	2	5.0%	4	10.0%	0.4
Lid ecchymosis	4	10.0%	4	10.0%	0.9
Infection	2	5.0%	2	5.0%	0.9
Adhesion	4	10.0%	6	15.0%	0.5
Recurrent dacryocystitis	2	5.0%	2	5.0%	0.9
Premature tube extraction	2	5.0%	2	5.0%	0.9

This table demonstrated that, there was statistically non-significant difference in post-operative complications between endoscopic DCR with (MMC) application group (A) and endoscopic DCR without (MMC) application group (B).

Group (A): No postoperative complications in 60.0% in endoscopic DCR with (MMC) application group (A), mild epistaxis in 2 cases (5.0%); lid ecchymosis in 4 cases (10.0%); infection in 2 cases (5.0%); adhesion in 4 cases (10.0%) recurrent dacryocystitis in 2 cases (5.0%) premature tube extraction in 2 cases (5.0%).

Group (B): No postoperative complications in 50% in endoscopic DCR without (MMC) application group (B); mild epistaxis in 4 cases (10.0%); lid ecchymosis in 4 cases (10.0%); infection in 2 cases (5.0%); adhesion in 6 cases (15.0%) recurrent dacryocystitis in 2 cases (5.0%) premature tube extraction in 2 cases (5.0%) and there was statistically non-significant difference between both groups.

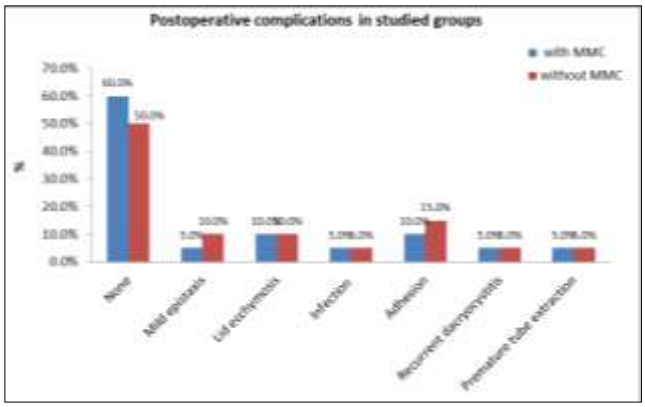

Fig 3: Postoperative complications.

Disruption

In the present study, group(A) DCR with MMC application it was found that the success rate was reported in 37 cases (92.5%) and failure in 3 cases (7.5%); while in group (B) DCR without MMC application it was found that the success rate was reported in 33 cases (82.5%) and failure in 7 cases (17%); and there was statistically significant difference of success rates in endoscopic DCR with (MMC) application group (A) in comparison to endoscopic DCR without (MMC) application group (B) (92.5% vs82.5%. respectively). These results are in agreement with an earlier study by (Cokkser *et al*., 2000) [3] that found comparable success rates between endoscopic DCR with MMC and endoscopic DCR without MMC (90% versus 80%). In addition, (Lee *et al*. 2010) [4] compared endoscopic DCR with MMC application and endoscopic DCR without MMC application with regards to efficacy, defined as full success, partial success and anatomic patency.

Maini *et al*. (2007) [5] compared surgical endoscopic endonasal DCR and laser endoscopic endonasal DCR and reported that endonasal laser DCR had better symptomatic success rates at 3 months but lower symptomatic success rates at 12 months. However, this difference was not statistically significant.

In Saroj and Rashmi (2010) [6] study the success rate of endoscopic DCR with MMC application was 90% and this agree with our study.

Leong *et al*. (2010) [7] reported that, the success rate was 94% for endoscopic DCR with MMC application compared with 86% for endoscopic DCR without MMC application at the average clinic follow-up period and these results are in agreement with our study that found comparable success rates between endoscopic DCR with MMC and endoscopic DCR without MMC (92.5% versus 82.5%). Which was

comparable to previously published data showing better outcome after MMC application in endoscopic DCR.

Tsirbas and Wormald, 2003 [8] although reported that, the success rate was 94% for endoscopic DCR with MMC application compared with 86% for endoscopic DCR without MMC application at the average clinic follow-up period and these results are in agreement with our study that found comparable success rates between endoscopic DCR with MMC and endoscopic DCR without MMC (92.5% versus 82.5%). were comparable with previously published data showing better outcome after MMC application in endoscopic DCR.

On the other hand a retrospective cohort study was done by (Ben Simon, 2005) [9] comparing success rates of endoscopic DCR with MMC application (86 %) and endoscopic DCR without MMC application (90 %) disagree with our study.

In the present study, there was statistically significant difference between intra-operative complications in group (A) and group (B) in prolapse of periorbital fat with (P. value < 0.05) and also in damage of the sac wall with (P. value < 0.04).

In the present study, there was statistically non-significant difference in post-operative complications between endoscopic DCR with (MMC) application group (A) and endoscopic DCR without (MMC) application group (B).

These results of our study were in agreement with the study of Tanenbaum & McCord, in 1998 [10]. Damage to sac wall occurred in three cases during endoscopic DCR without MMC application, and prolapse of periorbital fat occurred in two cases due to too much posterior dissection to expose the posterior part of the sac. Linberg, in 2000 [11] said that damage to sac wall occurred in three cases during endoscopic DCR without MMC application, and prolapse of periorbital fat occurred in two cases due to too much posterior dissection to expose the posterior part of the sac. These results were in agreement with our study. And these results of our study were in agreement with the study of Fernandes *et al.* in 2001 [12]. Damage to sac wall occurred in three cases during endoscopic DCR without MMC application, and prolapse of periorbital fat occurred in two cases due to too much posterior dissection to expose the posterior part of the sac. In Sprekelsen study in 1996 [13], orbital fat exposure occurred in 16 cases (10.5%) and troublesome bleeding occurred in one patient from anterior ethmoidal artery which was coagulated endoscopically using monopolar cautery.

In the present study, there was statistically non-significant difference in postoperative complications between endoscopic DCR with (MMC) application group (A) and endoscopic DCR without (MMC) application group (B), postoperative complication was in 16 cases (40 %) compared to 20 cases (50%) in endoscopic DCR without (MMC) application group (B).

Conclusion

Results of the present study revealed that, endoscopic DCR with MMC application had a comparable success rate over endoscopic dacryocystrhinostomy (DCR) without MMC application and had advantages of having a higher success rate, less intraoperative and postoperative complication.

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