



A COMPARATIVE STUDY OF ENDOSCOPIC ENDONASAL DACROCYSTORHINOSTOMY WITH AND WITHOUT INTRAOPERATIVE 5- FLUOROURACIL APPLICATION

ENT

Dr Rajneesh Khelgikar	Professor, department of otorhinolaryngology, Navodaya medical college, hospital and research centre, Raichur
Dr Savitha Balakrishna	Postgraduate, department of otorhinolaryngology, Navodaya medical college, hospital and research centre, Raichur.
Dr Shweta Sawant	Assistant Professor, department of otorhinolaryngology, Navodaya medical college, hospital and research centre, Raichur.
Dr Shriya P Basti	Assistant Professor, department of otorhinolaryngology, Navodaya medical college, hospital and research centre, Raichur.

ABSTRACT

Background: Aim and objective were to evaluate the use of intraoperative 5-fluorouracil to reduce the failure rate and to compare the results of primary endoscopic endonasal dacrocystorhinostomy with and without intraoperative 5-fluorouracil application. **Methods:** The present study was conducted prospectively on 50 patients, randomized into two groups group A and group B undergoing endoscopic endonasal dacrocystorhinostomy. In group A patients, a pledge soaked in 0.5mg/ml of 5-fluorouracil was applied to rhinostomy site for 5 minutes under endoscopic visualization. Nasal cavity was packed with merocel immersed in antibiotic ointment, pack was removed on next day. An oral antibiotics, antibiotic eye drops, saline nasal drops and analgesics was advised to the patient in postoperative period. 5-fluorouracil was not used in group B patients. Regular follow up of patients was done at 1st week, 1st month and 6 months. On each visit, lacrimal irrigation and nasal endoscopy was done. The two groups were compared with regard to complications as well as success rate. **Results:** Among the patients followed up for 6 months, endoscopic dacrocystorhinostomy with intraoperative topical application of 5-fluorouracil to rhinostomy site were successful in 12(48%) compared with 10 (40%) for the control group which was statistically significant. **Conclusions:** Intraoperative topical application of 5-Fluorouracil increases the patency rate in endoscopic endonasal dacrocystorhinostomy.

KEYWORDS

dacrocystorhinostomy, 5 fluorouracil, lacrimal syringing

INTRODUCTION

Epiphora is the primary symptom in primary acquired dacryocystitis due to stasis of tears in the lacrimal sac leads to recurrent infections of the sac causing chronic dacryocystitis. The traditional treatment for this is External Dacryocystorhinostomy.

The Endonasal approach was introduced in 1893 by Caldwell¹ and later modified by West² and Halle.³ The first clinical study on the technique of Endoscopic Dacryocystorhinostomy was published by McDonough and Meiring in 1989⁴

Success rates of Endonasal DCR varies from 82% to 95%^{5,6} when compared to External DCR, which has success rates ranging from 90% to 97%.⁷⁻⁹ In order to increase the success rate, reclosure is due to scarring, adhesions and granulation tissue formation is prevented using antimetabolites like 5 fluorouracil and mitomycin C.

5-Fluorouracil is a synthetic pyrimidine that inhibits fibroblast formation, as it blocks the enzyme thymidylate synthase involved in DNA synthesis.¹⁰

OBJECTIVE

To compare the outcome of dacrocystorhinostomy with and without the intraoperative application of 5-fluorouracil in preventing reclosure of the dacrocystorhinostomy stoma in patients of primary acquired nasolacrimal duct obstruction.

MATERIALS AND METHODS

Study design and setting:

prospective comparative interventional study

Study period: 6 months

Sample size: 50

50 patients with nasolacrimal duct obstruction who comply inclusion and exclusion criteria and willing for endoscopic endonasal dacrocystorhinostomy surgery randomly taken up for the study after taking written consent form.

Inclusion Criteria:

- 1) Patients with constant epiphora / dacryocystitis and nasolacrimal duct obstruction refractory to conventional medical treatment

confirmed clinically by syringing and by dacryocystography

- 2) Patients with age more than 15 years and less than 50 years
- 3) Patients willing to undergo surgery

Exclusion Criteria:

1. Patients less than 15 years and more than 50 years
2. Patients with nasal and canalicular pathology
3. Patients with bleeding disorders
4. HBsAg and HIV positive patients and other chronic inflammatory diseases that would interfere with wound healing
5. Hypertension, Diabetes mellitus, Chronic cardiac illness, chronic renal failure patients, malignancies and medically certified unfit for anaesthesia
6. Patients having nasolacrimal duct obstruction secondary to trauma, malignancy and lower eyelid laxity
7. Patients having the marked deviation of nasal septum on same side, chronic sinusitis, nasal polyps, severe bony deformity of lacrimal sac fossa (post traumatic) and history of previous DCR
8. Patients with pre-sacral obstructions, acute dacryocystitis, chronic granulomatous condition, long standing chronic dacryocystitis with fibrosis of sac, chronic dacryocystitis with fistulas, ectropion, entropion, atrophic rhinitis

Procedure

Written informed consent was taken from all the patients about their involvement in the study. 50 patients underwent endoscopic endonasal dacrocystorhinostomy, randomized into two groups, group A and group B.

Group A patients:

A surgical sponge soaked in 0.5 mg/ml solution of 5-fluorouracil was applied to the mucosal border of the rhinostomy site for 5 minutes under endoscopic visualization. Nasal cavity was packed with roll gauge immersed in antibiotic ointment. Pack was removed on next day. Antibiotics, antibiotic eye drops, saline nasal drops, and analgesics were advised to the patient in postoperative period.

Group B patients

5-fluorouracil was not applied at rhinostomy site during surgery. Regular follow up was done at 1st week, 1st month and 6 months. On each visit, lacrimal syringing and nasal endoscopy was done. All data collected was included in the data analysis.



Figure1: Lacrimal sac incised using Sickie knife

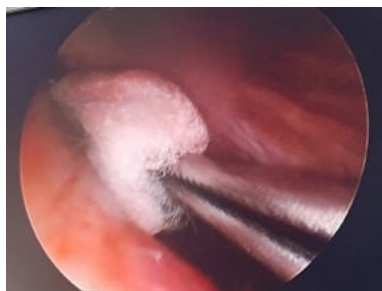


Figure2: Application of 5-fluorouracil soaked cottonoid at rhinostomy site

Statistical Analysis

Statistical Package for Social Sciences[SPSS] for Windows, Version 23.0 software was used for data analysis. Results are expressed as number and percentages. Chi square test was used to compare outcome of endonasal dacryocystorhinostomy with and without intra operative 5-Fluorouracil. Catagorical data was analysed by Chi-square test. P-value of 0.05 or less was considered statistically significant.

RESULTS

Table I: Distribution of age with respect to study groups.

			Group		Total
			control	Study	
Age	20-29	Count	11	5	16
		% within Group	44.0%	20.0%	32.0%
	30-39	Count	7	9	16
		% within Group	28.0%	36.0%	32.0%
	40-49	Count	2	9	11
		% within Group	8.0%	36.0%	22.0%
	50-59	Count	3	2	5
		% within Group	12.0%	8.0%	10.0%
	More than 60	Count	2	0	2
		% within Group	8.0%	0.0%	4.0%
Total		Count	25	25	50
		% within Group	100.0%	100.0%	100.0%

Majority 32 (64%) of the participants belonged to 20 to 39 years of age, of which 18 (36%) of them were from control group and remaining 14 (28%) of them were from study group.

Table II: Gender distribution with respect to study groups.

Gender			Group		Total
			control	Study	
	Female	Count	14	18	32
		% within Group	56.0%	72.0%	64.0%
	Male	Count	11	7	18
		% within Group	44.0%	28.0%	36.0%
Total		Count	25	25	50
		% within Group	100.0%	100.0%	100.0%

Majority 32 (64%) of the participants were females, of which 18 of them were from study group and remaining 14 of them were from control group.

Table III: Showing site of surgery. (n=50)

Site of surgery		Frequency	Percent
	Left dacryocystorhinostomy	19	38.0
	Right dacryocystorhinostomy	31	62.0
	Total	50	100.0

Among 50 study participants 62% of them underwent right sided dacryocystorhinostomy.

Table IV: Comparing outcome of the surgery between 2 groups.

		Group				Chi-square value	P value
		Study		control			
		Count	Row N %	Count	Row N %		
1st week	Patent	25	50.0%	25	50.0%	--	--
1st month	Not Patent	1	100.0%	0	0.0%	3.50	0.174
	Partially Patent	9	37.5%	15	62.5%		
	Patent	15	60.0%	10	40.0%		
6th month	Not Patent	8	34.8%	15	65.2%	7.312	0.026
	Partially Patent	5	100.0%	0	0.0%		
	Patent	12	48%	10	40%		

The above table shows that after 1 month of surgery 60% of them in study group had patent nasolacrimal duct and 40% in the control group had nasolacrimal duct patent. After 6 months of surgery 48% of them in study group had patent nasolacrimal duct and 40% in the control group had patent nasolacrimal duct.

Post Operative Care

The nasal pack was removed and lacrimal syringing was done on the first day of postoperative day. Intravenous antibiotics was given on the day of surgery followed by oral antibiotics and analgesics and antibiotic eye drops for oneweek. Patient was advised to do lacrimal massaging. The postoperative follow up was done a week

After discharge and then 1st month, 6months, each time lacrimal syringing was done and endoscopic visualization for any crust, synechia, noted and subsequently removed.

DISCUSSION

Karim Bakri et al compared intraoperative 5-Fluorouracil and isotonic solution in Endonasal Laser Dacryocystorhinostomy, reporting no improvement in the success rate of patency of rhinostomy site¹¹.

Ayşe Burcu Dirim et al, compared anatomical and functional success rates in patients with primary acquired nasolacrimal duct obstruction undergoing external dacryocystorhinostomy (EX-DCR) either with adjunctive 5-Fluorouracil (5-FU) or silicone tube intubation concludes that EX-DCR augmented with 5-FU may represent a more feasible and cost-effective therapeutic option as compared to silicone tube placement¹².

CONCLUSION:

As conclusion there was statistically significant difference between the success rates of primary endonasal DCR with and without the use of intra operative 5-fluorouracil in Primary acquired Nasolacrimal Duct Obstruction. 5-fluorouracil application is beneficial in Primary endonasal DCR. There were no complications related to the intra operative use of 0.5mg /ml of 5-fluorouracil for 5 minutes. However, more randomized control trials involving more participants and longer follow ups are required to establish the potential benefit of antimetabolites in Primary DCR surgery.

Acknowledgements

I would like to thank all the senior colleague for their guidance and support and junior colleague for helping complete this article

Funding: No funding sources

Conflict of interest: None declared

Ethical approval: The study was approved by the Institutional Ethics Committee

REFERENCES

1. Ragab SM, Elsherif HS, Shehata EM, Mitomyien c Enhanced Revision Endoscopic Dacryocystorhinostomy: A Prospective Randomized Controlled Trial. *Otolaryngol HEAD NECK SURG.* 2012;147(5):937-942
2. West JM.A Window Resection of The Nasal duct in Cases of Stenosis. *Trans AM ophthalmos Soc.* 1910;(pt2):654-658.
3. Halle M. Zur Intransalen Operation Am Tranensack *Laryngol Rhinol.*1914; 100:41□44.
4. McDonogh M, Meiring JH. Endoscopic Transnasal Dacryocystorhinostomy. *J Laryngol Otol.* 1989;103(6):585□587.)
5. Wormald PJ. Powered Endoscopic Dacryocystorhinostomy. *Laryngoscope* 2002;112(1):69-72
6. Eloy P, Bertrand B, Martinez M. Endonasal Dacryocystorhinostomy:Indications, Technique And Results. *Rhinology.* 1995;33(4):229□233.
7. Hurwitz JJ, Rutherford S. Computerized Survey of Lacrimal Surgery Patients. *Ophthalmology.* 1986;93(1):1419.
8. Hartikainen J, Antila J, Varpula M. Prospective Randomized Comparison of Endonasal Endoscopic Dacryocystorhinostomy And External Dacryocystorhinostomy. *Laryngoscope.* 1998;108(12):1861□1866.
9. Mukhtar SA, JamilAZ, Ali. Efficacy of External Dacryocystorhinostomy (Dcr) with and without Mitomycin-C In Chronic Dacryocystitis. *J coll Physicians Surg Pak.*2014; 24(10):732-735
10. M. S. Blumenkranz and A. Clafin, "Selection of therapeutic agents for intraocular proliferative disease: cell culture evaluation," *Archives of Ophthalmology*, vol. 102, no. 4, p. 598, 1984
11. Karim Bakri, Nick S Jones, Richard Downes, Ahmed Sadiq Intraoperative Flurouracil in Endonasal Laser Dacryocystorhinostomy *Arch otolaryngol Head neck surg.* 2003;129:233-235
12. Ays,e Burcu Dirim , Ibrahim Çağrı T ` u`rker , Ceylan Uslu Dog`an , Selam Yekta S, endul and Emine Betu`l Akbas, O` zyu`rek Success Rate Comparis on of External Dacryocystorhinostomy with 5-FU Application or Silicone Tube Intubation *Hindawi Journal of Ophthalmology* Volume 2022, Article ID 2941283, 5 page doi.org/10.1155/2022/2941283