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Comparative Evaluation Of Surgical Outcomes In Endoscopic Dacryocystorhinostomy Using Gouge Or Drill, With And Without Stenting

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ABSTRACT

Background: Existing literature data is scarce concerning the use of endoscopic dacryocystorhinostomy without intubation as the treatment in subjects with chronic epiphora resulting from post-saccal stenosis of lacrimal drainage system and has contradictory results.
Aim: The present study was aimed to comparatively evaluate surgical outcomes in endoscopic dacryocystorhinostomy using gouge or drill, with and without stenting in the management of epiphora due to nasolacrimal duct obstruction.
Methods: The present study assessed 60 subjects from all the ag ranges and from both the genders that had the features of dacryocystitis. The included subjects were divided randomly to be managed by one of the surgeries as Dacryocystorhinostomy using only Gouge (NSGO), Dacryocystorhinostomy using Powered instruments (NSPI), Dacryocystorhinostomy using Stents and Gouge (STGO), and Dacryocystorhinostomy using Stent and Powered instruments (STPI). All the subjects were followed till 1 year and data were assessed concerning outcomes, complications, and recurrence after treatment.
Results: The study results showed that surgery had100% success rates at day 3 and 7. At 1 month, success rate for all the procedures was 100% except for NSGO. At 3 and 6 months the success rates for STPI, STGO, NSPI, and NSGO were 86%, 100%, 100%, and 86% respectively. At 1 year follow-up, success rates for STPI, STGO, NSPI, and NSGO were 71%, 100%, 100%, and 57% and difference was statistically significant with $p<0.05$. The results depicted that success rates were comparable for all four surgical procedures used in the study.
Conclusion: The present study concludes that endoscopic DCR (Dacryocystorhinostomy) is a safe day care procedure done under local anesthesia and shows excellent results with efficacy ranging from 86% to 100% after 3 and 6 months and 57% to 100% at 1 year with comparable success for STPI, STGO, NSPI, and NSGO. It is recommended to perform DCR with gouge or drill with or without stent.

Keywords*: DCR, Dacryocystorhinostomy, Dacryocystorhinostomy using Stent, Dacryocystorhinostomy using gouge.*

INTRODUCTION

Epiphora is a term which represent a common complaint which can be seen secondary to excessive tear production and arise from the proximal obstruction seen in the drainage system at the common canaliculus or punctum. The obstruction in the nasolacrimal duct is seen in nearly 10% subjects at the age of 40 year and it increase to nearly 40% in subjects aged 90 years. DCR or Dacryocystorhinostomy is an endoscopically performed surgery used for restoration of the tears in the nasal cavity via an opening made in lacrimal sac by removing the lacrimal crest and the mucosa present on it. It is indicated in subjects where obstruction is not relieved by simple syringing and probing.[1]

The surgical procedures can be done utilizing either the endonasal or external approach. The intranasal approach was described initially by Caldwell in the year 1893 and external approach by Toti in year 11904 and since then it is the main modality for management along with the flaps. The results were further improved and refined by the year 1962 with the addition of silastic tube intubation. The intranasal approach was not being used attributed to concerns associated with visualizing using the modern endoscopes, it has again started to gain interest.[2]

Modern endonasal DCR procedure was done in year 1989 for the first time. Endoscopic DCR cam be done with success under local anesthesia and as a day care procedure with a higher efficacy of 80-90% and the lower complication rates. Endoscopic DCR can also be performed utilizing the Laser method or any other method for removing mucosa and bone including radio surgical electrodes, punches, and/or power drills. ENLDCR (Laser assisted DCR) has not been widely accepted and is not popular among the surgeons owing to difficulty in removing thick bone from frontal process of the maxilla with Laser with success rates in range of 60-86%, whereas, endonasal DCR with other tools ("cold steel") seems to have a slightly higher success rate.[3]

Previous studies from the literature have reported that using silicon intubation in nasolacrimal pathway helps in maintenance of lacrimal duct patency. However, few other literature studies have reported results against this and recommended the use of endoscopic dacryocystorhinostomy without intubation as management of choice in subjects with chronic epiphora due to postsaccal stenosis of the lacrimal drainage system.[4] Hence, the present study was aimed to comparatively evaluate surgical outcomes in endoscopic dacryocystorhinostomy using gouge or drill, with and without stenting in the management of epiphora due to nasolacrimal duct obstruction.

MATERIALS AND METHODS

The present prospective study was aimed to comparatively evaluate surgical outcomes in endoscopic dacryocystorhinostomy using gouge or drill, with and without stenting in the management of epiphora due to nasolacrimal duct obstruction. The study was done at Department of Otorhinolaryngology, Akash Institute of Medical Sciences & Research Centre, Devanahalli, Banglore, Karnataka. The study subjects were from the Department of ear, nose, and throat of the Institute. Verbal and written informed consent were taken from all the subjects before study participation.

The study assessed 60 subjects from all the ag ranges and from both the genders that had the features of dacryocystitis including symptomatic distal obstruction of nasolacrimal duct that is not relieved by simple probing and syringing. All subjects that had clinical features of chronic dacryocystitis underwent dacryocystogram.

After final inclusion of 60 study subjects, the subjects were divided randomly into one of the following surgical groups to be managed with either Dacryocystorhinostomy using only Gouge (NSGO), Dacryocystorhinostomy using Powered instruments (NSPI), Dacryocystorhinostomy using Stents and Gouge (STGO), or Dacryocystorhinostomy using Stent and Powered instruments (STPI).

All the subjects were followed at days 3, 7, 1 month, 3 months, 6 months, and 1 year. At all the visits, the patency was assessed for dacryocystorhinostomy. The data were gathered in all the study subjects concerning surgery duration, surgery outcomes, outcomes with and without the use of the stent, time for recovery, recurrence of disease, and complications of the surgery.

Data captured from the study subjects were assessed with chi-square test, Fisher's exact test, Mann Whitney U test, and SPSS (Statistical Package for the Social Sciences) software version 24.0 (IBM Corp., Armonk. NY, USA) using ANOVA and student's t-test. The significance level was considered at a p-value of <0.05.

RESULTS

The present prospective study was aimed to comparatively evaluate surgical outcomes in endoscopic dacryocystorhinostomy using gouge or drill, with and without stenting in the management of epiphora due to nasolacrimal duct obstruction. The present study assessed 60 subjects from all the ag ranges and from both the genders that had the features of dacryocystitis. The included subjects were divided randomly to be managed by one of the surgeries as Dacryocystorhinostomy using only Gouge (NSGO), Dacryocystorhinostomy using Powered instruments (NSPI), Dacryocystorhinostomy using Stents and Gouge (STGO), and Dacryocystorhinostomy using Stent and Powered instruments (STPI). All the subjects were followed till 1 year and data were assessed concerning outcomes, complications, and recurrence after treatment.

It was seen that for the distribution of study subjects based on the surgical procedure done, STPI was done in 23.3% (n=14) study subjects, STGO in 27% (n=16) study subjects, NSPI in 27% (n=16) study subjects, and NSGO was done in 23.3% (n=14) study subjects respectively among the 60 subjects assessed in the present study (Table 1).

Table 1: Distribution of study subjects based on the surgical procedure done

S. No	Surgical procedure done	Number (n)	Percentage (%)
1.	**STPI**	14	23.3
2.	**STGO**	16	27
3.	**NSPI**	16	27
4.	**NSGO**	14	23.3
5.	**Total**	60	100

The study results showed that for distribution of intraoperative findings based on surgical procedure performed, in STPI group, deviated nasal septum was seen in 22.2% (n=4) subjects, 33.3% (n=4) subjects with allergic rhinitis, and no findings in 25% (n=6) subjects. In STGO group, deviated nasal septum, Hypertrophic turbinate, concha bullosa, allergic rhinitis, and no finding was seen in 11.1% (n=2), 50% (n=2), 100% (n=2), 33.3% (n=4), and 25% (n=6) subjects respectively. In NSPI group, deviated nasal septum. Hypertrophic turbinate, and no finding was seen in 33.3% (n=6), 50% (n=2), and 33.3% (n=8) subjects respectively. In NSGO group, deviated nasal septum, allergic rhinitis, and no finding was seen in 33.3% (n=6), 33.3% (n=4), and 16.6% (n=4) subjects respectively (Table 2).

Table 2: Distribution of intraoperative findings based on surgical procedure performed

S. No	Surgical procedure				
		Punctal trauma n (%)	**Periorbital edema n (%)**	**Granulation n (%)**	**Synechiae n (%)**
1.	**STPI**	0	10 (31.1)	4 (16.6)	0
2.	**STGO**	0	6 (25)	4 (16.6)	0
3.	**NSPI**	4 (66.6)	6 (19)	6 (25)	2 (50)
4.	**NSGO**	2 (33.3)	8 (25)	10 (41.7)	2 (50)
5.	**Total**	6	32 (100)	24 (100)	4 (100)

Concerning the distribution of postoperative complications based on surgical procedure type, periorbital edema and granulation was seen in 31.1% (n=10) and 16.6% (n=4) subjects respectively. In STGO group, periorbital edema and granulation was seen in 25% (n=6) and 16.6% (n=4) subjects respectively. In NSPI group, punctal trauma, periorbital edema, granulation, and synechiae was seen in 66.6% (n=4), 19% (n=6), 25% (n=6), and 50% (n=2) subjects respectively. In NSGO group, punctal trauma, periorbital edema, granulation, and synechiae was seen in 33.3% (n=2), 25% (n=8), 41.7% (n=10), and 50% (n=2) subjects respectively (Table 3).

Table 3: Distribution of postoperative complications based on surgical procedure type

S. No	Surgical procedure	Deviated nasal septum n (%)	Hypertrophic turbinate n (%)	Concha bullosa n (%)	Allergic rhinitis n (%)	No findings n (%)
1.	**STPI**	4 (22.2)	0	0	4 (33.3)	6 (25)
2.	**STGO**	2 (11.1)	2 (50)	2 (100)	4 (33.3)	6 (25)
3.	**NSPI**	6 (33.3)	2 (50)	0	0	8 (33.3)
4.	**NSGO**	6 (33.3)	0	0	4 (33.3)	4 (16.6)
5.	**Total**	18 (100)	4 (100)	2 (100)	12 (100)	100

DISCUSSION

The present study assessed 60 subjects from all the ag ranges and from both the genders that had the features of dacryocystitis. The included subjects were divided randomly to be managed by one of the surgeries as Dacryocystorhinostomy using only Gouge (NSGO), Dacryocystorhinostomy using Powered instruments (NSPI), Dacryocystorhinostomy using Stents and Gouge (STGO), and Dacryocystorhinostomy using Stent and Powered instruments (STPI). All the subjects were followed till 1 year and data were assessed concerning outcomes, complications, and recurrence after treatment. The design of the present study was similar to the study design adopted by the previous studies of Harugop AS et al[5] in 2008 and Singh K et al[6] in 2024 where study design similar to the present study was also used by the authors.

The study results showed that for the distribution of study subjects based on the surgical procedure done, STPI was done in 23.3% (n=14) study subjects, STGO in 27% (n=16) study subjects, NSPI in 27% (n=16) study subjects, and NSGO was done in 23.3% (n=14) study subjects respectively among the 60 subjects assessed in the present study. These results were in line with the findings of Jae Wook Yong et al[7] in 2012 and Vishwakarma R et al[8] in 2004 where authors used surgical procedures similar to present study were also used by the authors.

It was seen that for distribution of intraoperative findings based on surgical procedure performed, in STPI group, deviated nasal septum was seen in 22.2% (n=4) subjects, 33.3% (n=4) subjects with allergic rhinitis, and no findings in 25% (n=6) subjects. In STGO group, deviated nasal septum, Hypertrophic turbinate, concha bullosa, allergic rhinitis, and no finding was seen in 11.1% (n=2), 50% (n=2), 100% (n=2), 33.3% (n=4), and 25% (n=6) subjects respectively. In NSPI group, deviated nasal septum. Hypertrophic turbinate, and no finding was seen in 33.3% (n=6), 50% (n=2), and 33.3% (n=8) subjects respectively. In NSGO group, deviated nasal septum, allergic rhinitis, and no finding was seen in 33.3% (n=6), 33.3% (n=4), and 16.6% (n=4) subjects respectively. These findings were in agreement with the results of Al-Qahtani AS et al[9] in 2012 and Longari F et al[10] in 2016 where results reported by the authors for intraoperative findings based on surgical procedure were comparable to the results of the present study.

On assessing the distribution of postoperative complications based on surgical procedure type, periorbital edema and granulation was seen in 31.1% (n=10) and 16.6% (n=4) subjects respectively. In STGO group, periorbital edema and granulation was seen in 25% (n=6) and 16.6% (n=4) subjects respectively. In NSPI group, punctal trauma, periorbital edema, granulation, and synechiae was seen in 66.6% (n=4), 19% (n=6), 25% (n=6), and 50% (n=2) subjects respectively. In NSGO group, punctal trauma, periorbital edema, granulation, and synechiae was seen in 33.3% (n=2), 25% (n=8), 41.7% (n=10), and 50% (n=2) subjects respectively. These results were consistent with the findings of Shah H et al[11] in 2013 and Monga J et al[12] in 2019 where results for postoperative complications based on surgical procedure type similar to the present study were also reported by the authors in their studies.

CONCLUSION

Within its limitations, the present study concludes that endoscopic DCR (Dacryocystorhinostomy) is a safe day care procedure done under local anesthesia and shows excellent results with efficacy ranging from 86% to 100% after 3 and 6 months and 57% to 100% at 1 year with comparable success for STPI, STGO, NSPI, and NSGO. It is recommended to perform DCR with gouge or drill with or without stent.

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