ORIGINAL ARTICLE

COMPARISON OF SURGICAL OUTCOME IN ENDOSCOPIC DACRYOCYSTORHINOSTOMY WITH AND WITHOUT SILICON STENT PLACEMENT

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ABSTRACT

Objective: The purpose of this study was to compare the long term surgical outcome in endonasal dacrycystorhinostomy (DCR) with and without silicon stent placement.

Subjects and method: A retrospective comparative analysis of 129 patients who underwent primary endoscopic DCR with stenting (group A) or without stenting (group B) was done. Success was defined as grade 0 or grade 1 epiphora at minimum 6 months follow up and complete patency of the lacrimal drainage system confirmed by irrigation. Patients were followed up for mean 28 weeks, (range 6 months to 2 years). Stents were usually removed at about three to six months (mean 21 weeks).

Results: Out of the 129 patients, 90 underwent silicon stent placement (group A) as against 39 patients in which DCR was done without stenting (group B). Out of 90 patients of group A, 84 (93.33%) showed complete recovery of symptoms (epiphora grading 0-1) Out of 39 patients of group B 35(92.30%) showed complete recovery of symptoms at six months follow up. Patients with stent placements showed a slightly higher rate of success as compared to patients without stenting (93.33%/ 92.30%). There was however no statistical difference in the success rate between group A and group B (p- 0.8086).

Conclusion: Silicon intubation of the nasolacrimal duct may not contribute to the success of endonasal DCR. Other factors such as size of the rhinostomy and presence of infection also play an important role in success of endonasal DCR.

Key words: Dacryocystorhinostomy, endonasal DCR, silicon stent, nasolacrimal duct obstruction

INTRODUCTION

Dacryocystorhinostomy (DCR) is a procedure performed to drain the lacrimal sac in cases of nasolacrimal duct obstruction or in chronic dacryocystitis.[1] it can be performed externally or endoscopically. Caldwell was the first to describe an endonasal approach to treat nasolacrimal duct obstruction (NLDO). The popularity of intranasal dacryocystorhinostomy(DCR) was limited throughout the twentieth century due to poor visualization of the surgical site.[2] With the advent of fibreoptic endoscopes and rigid endoscopic techniques in the late 1980s and early 1990s, there has been renewed interest over the past decade in endoscopic DCR.[3,4] Endoscopic DCR has many advantages over external DCR. The main advantages are avoidance of facial scarring, no division of the medial canthal ligament and the preservation of the pump action of the lacrimal sac of the orbicularis oculi muscle.[5,6] Over the past 3 decades it has become common practice for surgeons to place stents or intubation tubes at the time of DCR. Different type of stents such as silicon single channel, silicon double channel, polyurethane and prolene stents have been used. Although no large prospective study has been done to show that there is an advantage to employing a stent at the time of surgery, it has been assumed and propagated that silicone tubing offers a stabile nonantigenic material that allows for stenting of the common canaliculus and rhinostomy, thereby increasing the success rate of the procedure. The aim of this study was to evaluate the long term comparative success rate of endonasal DCR with and without silicon stent placements. [7]

MATERIAL AND METHODS

A retrospective study of 129 consecutive patients who underwent primary endoscopic DCR with or without stenting at our hospital between January 2009 and March 2012 was done. These patients were divided into

two groups –group A in which primary endonasal DCR was followed by placement of silicon stent and group B in which no stent placement was done.

Preoperatively, a thorough examination of the lacrimal system that included probing and sac syringing to establish patency of the lacrimal system was done by the ophthalmology department in all patients. Nasolacrimal duct obstruction was confirmed by syringing where resistance to saline flow and regurgitation from opposite punctum was seen. Besides a detailed clinical examination and routine blood investigations, all patients underwent a standard rigid nasal endoscopy. This procedure allowed septal deviation and any additional nasal or sinus pathologic conditions to be evaluated and corrected if required.

We excluded any patient with evidence of canalicular obstruction, a lacrimal sac tumor, dacryolith, or traumatic obstruction. The procedure was performed in patients of chronic dacryocystitis or after resolution of acute inflammation. Informed consent was obtained after explaining the surgical procedure and its consequences to all patients.

Retrospective data collected included the patient's age, sex, affected side, symptoms, operative experience, and follow-up results.

Majority of the patients were operated under local anesthesia. Only young patients mainly below 18 years were operated under general anesthesia. The surgical technique used in this study has been extensively described by PJ Wormald.[8] Surgery was carried out by 0 degree endoscope. Mucosal flap was raised over the frontal process of maxilla after local infiltration with 2% lidocaine and 1: 200000 adrenaline. Bone was removed with Kerrisons straight and curved punches or by drilling to expose the lacrimal sac. Medial wall of the sac was incised with sickle knife and partially removed and marsupialised or completely removed. Syringing confirmed the patency of the rhinostomy. Prepackaged sets consisting of silicone tubes attached to metal probes were used for silicone intubation. Silicon stents were passed through the upper and lower punctum and pulled through the rhinostome opening in all group A patients.

The nasal cavity was packed with ointment gauze or with gel foam. All patients were discharged the following day on oral decongestants, oral antibiotics and antibiotic eye drops.

Follow-up examinations were scheduled for 1 week, 1 month, 3 months, 6 months and 1 year after surgery. At each visit we asked the patients to grade their complaints according to the following scale: grade 0, no epiphora and complete resolution of tearing; grade 1, minimal epiphora and great improvement after stent placement with occasional tearing but not troublesome to the patient; grade 2, moderate epiphora and less frequent tearing after the procedure but still troublesome to the patient; and grade 3, severe epiphora and no improvement.[9] Size of the ostium was assessed by endoscopic visualization. The procedure was considered successful if the patient had grade 0 or grade 1 epiphora and complete patency of the lacrimal drainage system confirmed by irrigation at the final visit. Patients were followed up for one month to 2 year (mean 28 weeks). Stents were usually removed at about three to six months post surgery (mean 21 weeks).

RESULTS

This is a retrospective study comparing the outcome of stenting (group A) v/s non stenting (group B) in 129 consecutive patients who underwent endonasal DCR between January 2009 and March 2012.

Of the 129 operated patients majority were females 73.64 %(95/129) as against 26.35% male patients (34/129). The mean age was 40.44(group A) and 47.66 (group B). Age range was 16 -78 years.

Both eyes were almost equally affected. Left eye was affected in 60 patients compared to 58 of the right eye. 11 patient had bilateral symptoms of which one eye was operated at a time in 8 patients while 3 patients underwent bilateral DCR at the same time.

Table 1: Success rate of endonasal DCR of group A and group B patients at six months follow up

Group	**Total (n=129)**	**Success at 6 months (%)**	**Failure at 6 month (%)**
Group A	90	84 (93.33)	6 (6.66)
Group B	39	36 (92.30)	3 (7.69)

P value 0.08

All patients presented with epiphora pre operatively. 54 patients presented with purulent discharge and 72 with mucopurulent discharge. 3 patients presented with lacrimal fistula. All patients underwent a nasal endoscopy and pre operative ophthalmologic examination before surgery. Revision surgery was performed in 6 patients with history of either external or endonasl DCR. Operative details were however not present in any of the six patients

Table 2: Pre operative findings

Findings	**Group A (n=90) (%)**	**Group B (n=39) (%)**
Mucoid discharge	31 (34.44)	23 (58.97)
Mucopurulent discharge	56 (62.22)	16 (41.025)
Lacrimal fistula	3 (3.33)	0

Out of the 129 patients, 90 underwent silicon stent placement (group A) as against 39 patients in which DCR was done without stenting (group B). Out of 90 patients of group A, 84 (93.33%) showed complete recovery of symptoms (epiphora grading 0-1) at minimum six months follow up. Patency was assessed

by syringing after removal of stents or at six months in group B patients.

Out of 39 patients without lacrimal stenting (group B), 35(92.30%) showed complete recovery of symptoms at six months follow up. Patients with stent placements showed a slightly higher rate of success as compared to patients without stenting (93.33%/ 92.30%). Using the chi square test between group A and group B there was however no statistical difference in the success rate between the two groups (p- 0.8086).

Table 3: Intra operative complications and post operative complications

Complications	Group A (n=90) (%)	Group B (n=39) (%)
Inadequate stoma	7 (7.77)	4 (10.25)
Hemorrhage during surgery	12 (13.33)	2 (5.12)
Orbital fat exposure	1 (1.11)	1 (2.5)
Difficulty retrieving stent	6 (6.66)	-
Possible Cannilicular trauma	3 (3.33)	-
Stent granuloma	4 (4.44)	-
Premature removal of stent due to irritation	3 (3.33)	-
Stent extrusion	-	-
Post operative adhesions	4 (4.44)	3 (7.6)

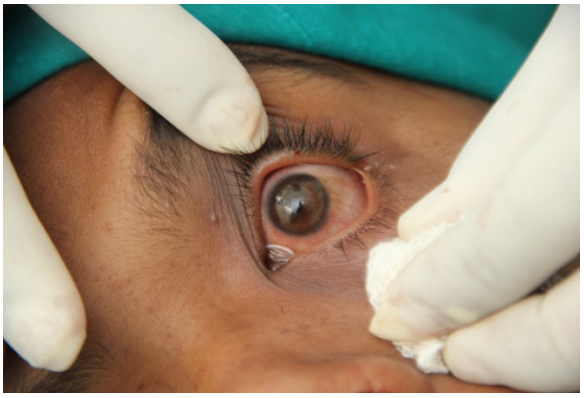

Fig 1: Silicon stent in situ

11 patients were lost to follow up before six months post surgery and hence were excluded from our study. All patients were followed up at least up to 6 months. Although no definitive time frame for stent retention has been established, it has been suggested that the silicone stent should remain in place for 6 to 12 months following surgery[7]. In this study stents were removed after an average of 3-6 months (mean 21 weeks) in patients of group A.

In 7 patients of group A premature stent removal had to be done due to punctum granuloma in 4 patients and foreign body sensation or infection in 3 patients. Out of these only 1 patients showed signs of failure. Spontaneous stent extrusion was not seen in any patient. Intraoperative complications were seen in patients14 patients in the form of excessive hemorrhage impairing vision during surgery in 12 patients and orbital fat exposure in 2 patients respectively. Difficulty in retrieving the probe from the nose and possible canalicular trauma was seen in 6 and 3 patients of group A respectively. Failure was most commonly due to synache formation or stoma closure.

DISCUSSION

Dacryocystorhinostomy (DCR) is a procedure performed to drain the lacrimal sac in cases of nasolacrimal duct obstruction or in chronic dacryocystitis.[1]The main purpose of treatment is to eliminate the obstruction and to accomplish normal tear flow. Overall three groups of procedures are currently practiced, external DCR, endonasal DCR with stents and endonasal DCR without stents. Controversies exist regarding the gold standard method of treatment for chronic dacryocystitis. Techniques such as probing, silicone intubation, and balloon dacryocystoplasty have also been used to recanalize the occluded nasolacrimal duct. The success rate of these methods at long-term follow-up was approximately 50% or less[10-14]. Endonasal DCR is a commonly performed operation in which a fistulous tract is created between the lacrimal tract and the nasal cavity. [6] Over the past 3 decades it has become common practice for surgeons to place stents or intubation tubes at the time of DCR. It has been assumed and propagated that they increase the success rate of the procedure by maintaining the patency of the fistula during the post operative healing period. Silicone intubation simultaneous with DCR was first described by Gibbs. [15]

In our study a 93.33% success rate was seen among patients of endonasal DCR in whom silicon stents were placed as against 92.30% success in those without stents. The success rate is hence comparable (p-0.80). This study shows that stent placement may not increase the success rate in endonasal DCR. Similar results were reported by Acharya et al[16] and Harvinder et al[1].Furthermore, Kakkar [17] and Unlu et al[18] did not find a significant difference in surgical success between DCR done with stents and those done without stents.

Dortzbach et al[19] made us aware that silicone intubation is not without its complications. Case reports subsequently showed up in the literature that seemed to support their work (e.g. Jordan and Nerad)[20]. Later animal models and human studies have shown that histopathologic changes are induced by the presence of these tubes but it remains unclear as to whether these changes are the result of simple mechanical irritation or are actually chemically induced by the silicone itself.[21,22,23,24] In our study we encountered four cases of punctum granuloma in group A patients and none in group B patients besides facing difficulty in retrieving the probe from the nose and possible canalicular trauma in 6 and 3 patients of group A respectively.

Vishwakarma et al.[25] in a prospective study of 272 patients however reported a higher success rate in patients of DCR with silicon stent placement. In 1989,

Allen and Berlin[26] however reported that silicone intubation at the time of DCR was associated with a statistically significant increase in the failure rate of primary DCR. After retrospectively looking at 242 consecutive DCRs with stents, they stated that routine use of silicone tubing in DCR should be avoided unless a specific canalicular obstruction was present.[26]

The question of whether stents helped, hindered, or ultimately had no affect on DCR in general still remains unclear. Studies indicate that other factors such as post operative infection, history of post operative trauma, and size of the rhinostomy may be much more important in surgical success.[1]Today, a vast majority of surgeons employ silicone intubation of the nasolacrimal duct following DCR including at our centre. In fairness we cannot call for the cessation of their use. Further, prospective randomized studies with a larger sample size are required for a more definite answer to this question.

In our study chronic dacryocystitis was found to be significantly more common in women than men. Sing et al[27] and Naik et al[28] also reported similar higher incidences of dacryocystitis in females. Chronic dacryocystitis has been reported to be more common in females of lower socioeconomic group due to bad personal habits, long duration of exposure to smoke in kitchen and dust exposure. Congenital and anatomical narrowing of the NLDO in females may also contribute to the higher incidence among women.[28]

CONCLUSION

Silicon intubation of the nasolacrimal duct may not contribute to the success of endonasal DCR. Other factors such as size of the rhinostomy and presence of infection also play an important role in success of endonasal DCR.

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