Role of Silicone Stenting in Endoscopic Dacryocystorhinostomy: A Comparative Study

ABSTRACT

Objective: To evaluate the role of using silicone stent in endoscopic dacryocystorhinostomy (DCR) and compare the results with endoscopic DCR without silicone stenting.

Design: Prospective study, interventional type, randomized design and comparative analysis.

Materials and methods: The study was done in Department of Otorhinolaryngology, Government Medical College and Dr Susheela Tiwari Hospital, Haldwani, Uttarakhand. We included 30 patients in the study presenting with epiphora with or without mucocele and congenital cases of dacryocystitis and nasolacrimal duct (NLD) blockage were included in the study.

All patients were divided into two groups. First one undergoing endoscopic DCR and silicone stent was used in all cases and second one underwent endoscopic DCR and no stent was used. Postoperative assessment was carried out at the end of 1st, 3rd, 6th and 10th week and the role of silicone stent was subjected to compare.

Result: Use of silicone stent was not improving the results and risk of failure of the surgery had increased with stent due to granulation formation in the lacrimal sac region.

Apart from that, foreign body reactions in the form of irritation, pain were seen with stent. It also added the cost of surgery without giving much benefit to the patient.

Keywords: Dacryocystitis, Endoscopic dacryocystorhinostomy, Silicone stent.


Source of support: Nil

Conflict of interest: None

INTRODUCTION

Dacryocystorhinostomy (DCR) is a surgical procedure performed to create a new tear drainage pathway between the eye and nose when the tear drain becomes obstructed at the level of nasolacrimal duct (NLD) which is the commonest site of blockage in lacrimal apparatus and in chronic dacryocystitis. It can be performed externally or endoscopically through transnasal approach. This was first described via an external approach by Toti in 1904. The first intranasal DCR was described by Caldwell in 1983. In 1989, McDonogh and Meiring described the endoscopic transnasal DCR. Endoscopic DCR has been gaining popularity with advancement in fiber optic and rigid endoscopic techniques and becomes more demanding surgery than the external DCR. It has many advantages over external approach like avoidance of scar mark over face, no need of dividing medial canthal ligament and preservation of pump action of lacrimal sac. Closure of the rhinostomy opening was considered a major factor of failure of external DCR while fibrosis of cutting edges of medial wall of lacrimal sac and reposition of nasal mucosa are common cause of failure of endoscopic DCR.

Several methods, such as use of silicone stent, application of mitomycin-C to the rhinostomy opening and suturing of the mucosal flaps have been tried for providing a permanent rhinostomy opening in external DCR. However, in endonasal DCR insertion of silicone stent is the most commonly preferred procedure. It has been claimed by many surgeons that silicone stent improves surgical outcomes of endoscopic DCR. On the other hand, some studies indicate that silicone stent itself is a reason of surgical failure due to granulation tissue formation; Allen and Berlin reported a higher failure rate when using silicone tubing. Stenting of the nasolacrimal system is also associated with complications including punctal fibrosis and tear of the canaliculi.

The present study was done to compare the surgical results of endoscopic DCR with and without silicone stent.

MATERIALS AND METHODS

This was a prospective study done to assess the role of silicone stent in cases of endoscopic DCR. It was conducted in the Department of ENT at Dr Susheela Tiwari Hospital and Government Medical College, Haldwani, Uttarakhand. The study was conducted for a period of 1 year from July 2012 to August 2013. Thirty cases were selected from outpatient department (OPD) of ENT. Age of the patients ranges from 10 to 50 years.
Following were the selection criteria for the study:

- Patients having signs and symptoms suggestive of nasolacrimal duct blockage
- Patients of congenital dacryocystitis which was not relieved after massaging and probing
- Patients with lacrimal sac mucocele

Patients with presacral canalicular or punctal blockage, agenesis of sac, lacrimal sac tumor, chronic sinusitis, nasal polyposis were excluded from study.

All patients were thoroughly examined by ophthalmologists for probing and syringing to confirm the diagnosis.

Diagnostic nasal endoscopy (DNE) was done in each case to rule out any deviated nasal septum, polyp or mass in nasal cavity. Patients with DNS were also taken and septoplasty was done in same sitting. X-rays of nose and paranasal sinuses were done in each case to see the status of sinuses.

Cases were randomly divided into two groups. Group A underwent endoscopic DCR and silicone stent was used. Group B patients were subjected to endoscopic DCR and no stent was used. After routine blood investigations, surgery was performed under local anesthesia in both groups of the patients having age above 18 years and general anesthesia was given in the patients below 18 years of age. Silicone stent was kept for 6 weeks postoperative in group A patients.

Surgical Technique

All patients underwent endoscopic DCR in local anesthesia were given premedication. One ampule of injection fortwin (pentazocine, 30 mg) and one ampule of injection phenargan (promethazine, 25 mg) were mixed and half of this mixture was given through intramuscular route 30 minutes before surgery and remaining half was given intravenously just before surgery.

The patient was positioned, draped and prepared as for standard endoscopic sinus surgery. The nasal cavity was packed for 15 minutes with ribbon gauze soaked in solution of 30 ml of topical xylocaine 4% with 3 ampules of injection adrenaline.

The nasal cavity was then examined endoscopically. Local infiltration of lateral wall of the nose was done with injection lignocaine 2% and injection adrenaline (1:100000) as per the standard dose.

Zero degree and 30° rigid endoscopes were used for surgery. Mucosal flap was raised from frontal process of maxilla, and the bone was exposed. Kerrisson punch was used to remove the bone and the lacrimal sac was visualized. Medial wall of the sac was incised with the help of sickle knife and by using Blakesly forcep medial wall was removed. A window is made in the mucosal flap in the region of sac and rest of the mucosa is repositioned. Syringing was done using solution of injection dexamethasone and injection amikacin. The silicone stent was put in group A patients. Nasal packing was used in those cases in which bleeding were anticipated. Patient was discharged on third postoperative day after removing nasal pack if used and syringing was done just prior to discharge with same solution as mentioned above. Regular follow-up of the patients was done at 1st, 3rd, 6th and 10th weeks.

OBSERVATIONS

Following observations were made at the end of 1 year. Out of 30 patients, 24 (80%) were female and 6 (20%) were male. The maximum number of patients was seen in 21 to 30 years of age group.

The complaints of the patients in the study were categorized as shown in Table 1.

Postoperative Assessment

Most of the patients were discharged on 2nd day of surgery and those having anterior nasal packing were discharged on third day after removing pack. Six patients of group A and 2 patients of group B required longer stay due to bleeding. Syringing was done on 1st, 3rd, 6th and 10th week. Diagnostic nasal endoscopy was performed in each case and postoperative assessment was compared at the end of 10th week as shown in Table 2.

DISCUSSION

Dacryocystitis is an inflammation of lacrimal sac leads to obstruction at the junction of sac and nasolacrimal duct. Congenital nasolacrimal duct blockage is seen. Females are affected in 80% of the cases. Rarely seen in males. Most patients are seen in his or her 3rd and 4th decades of life. Epiphora is the commonest presentation seen in all cases of NLD block and chronic dacryocystitis. Mucoid

### Table 1: Preoperative clinical features in two groups

<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Presenting signs/symptoms</th>
<th>Group A</th>
<th>Group B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Epiphora</td>
<td>15 (100%)</td>
<td>15 (100%)</td>
</tr>
<tr>
<td>2</td>
<td>Swelling in the lacrimal region (mucocele)</td>
<td>4 (26.6%)</td>
<td>3 (20%)</td>
</tr>
<tr>
<td>3</td>
<td>Mucopurulent discharge from medial canthus</td>
<td>5 (33.3%)</td>
<td>6 (40%)</td>
</tr>
<tr>
<td>4</td>
<td>Congenital dacryocystitis</td>
<td>2 (13.6%)</td>
<td>1 (6.6%)</td>
</tr>
<tr>
<td>5</td>
<td>Nasal obstruction (need septoplasty)</td>
<td>4 (26.6%)</td>
<td>5 (33.3%)</td>
</tr>
</tbody>
</table>
and mucopurulent discharges from the medial canthal region are seen in 33% of the cases. Some patients present with swelling in the lacrimal sac region (mucocele) and regurgitation test positive in these cases. Diagnostic nasal endoscopy also helps to rule out nasal pathology like signs of allergic rhinitis, nasal polyp and deviated nasal septum.

Dacryocystorhinostomy is surgical procedure in which nasolarimal duct is bypassed by making an opening in the medial wall of the lacrimal sac which drains directly in nasal cavity. It can be performed by external route called external DCR which is commonly performed by ophthalmologists. Surgical scar mark over the face is one of limitations of external DCR and as we know dacryocystitis is highly common in females so cosmesis is also very important aspect to look. With advancement in endoscopic surgery, nowadays endoscopic DCR is commonly performed in cases of NLD block and chronic dacryocystitis. Silicone stent has been proposed to maintain the patency of the tract during postoperative period.

This study was done to comment over the role of silicone stenting in endoscopic DCR. All 30 cases were randomly divided into two groups. Endoscopic DCR was performed in all cases. Silicone stent was kept in group A patients for a period of 6 weeks. Group B patients were operated and no stent was used.

In our clinical study, epiphora was subsided in 14 out of 15 cases in group A (93.3%) and 13 cases in group B (86.6%). Blockage was seen in one and two cases in group A and B respectively. Mucopurulent discharge and mucocele were subsided in all patients in both groups. Synechiae formation was seen in three cases in group A and two cases in group B. Diagnostic nasal endoscopy was done in each case to see the ostia in lacrimal sac region and were seen in 10 cases of group A and 12 in group B. There were four cases in group A where ostia were not visualized due to granulation tissue in the lacrimal sac region but syringing was patent in all four cases. In group B, ostium was not seen in two cases but syringing was patent. One failure case in group A had mucosal adhesions to the sac on DNE while in group B, there were two failures one was due to incomplete opening of the sac and other was due to mucosal adhesions to sac wall.

CONCLUSION

Nowadays endoscopic DCR is replacing conventional external DCR and getting popularity due to its advantages over external approach. Role of using silicone stent in endoscopic DCR is not very promising because it is not improving the outcome of surgery rather it has been seen more granulation formations in stent patient that may cause the failure in the later part of the life. Silicone stent adds the cost to the surgery and it causes irritation to the patient. Sometimes its removal is very painful. Endoscopic DCR without stent is the treatment of choice in patients of NLD blockage and chronic dacryocystitis.

REFERENCES


<table>
<thead>
<tr>
<th>Sl. no.</th>
<th>Postoperative assessment (10th week)</th>
<th>Group A (n = 15)</th>
<th>Group B (n = 15)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Syringing patent</td>
<td>14</td>
<td>13</td>
</tr>
<tr>
<td>2</td>
<td>Syringing blockage</td>
<td>2/1</td>
<td>5/2</td>
</tr>
<tr>
<td>3</td>
<td>Nasal obstruction</td>
<td>2/4</td>
<td>1/5</td>
</tr>
<tr>
<td>4</td>
<td>Synachea formation</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>5</td>
<td>Visualization of ostium in lacrimal sac on DNE</td>
<td>10</td>
<td>12</td>
</tr>
</tbody>
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