POLYPROPYLENE STENTING IN REVISION DACRYOCYSTORHINOSTOMY: A PROSPECTIVE STUDY

*M.S. Vijayashree, MS,** B. Viswanatha, MS, PhD, FACS

ABSTRACT

Objective: This study was done to evaluate the clinical efficacy of polypropylene for stenting in endoscopic revision dacryocystorhinostomy.

Patients and methods: Revision endoscopic dacryocystorhinostomy operation was performed in 10 patients (4 men and 6 women) between 2009 and 2014. After recreating an aperture in the medial wall of the lacrimal sac, 2/0 polypropylene suture material was inserted through both upper and lower canaliculi into the sac and both the ends were knotted in the nasal cavity. The polypropylene was left in the lacrimal sac for 3 months. The patients were followed up for 6 months. Based on the improvement in the complaint of epiphora, they were grouped as good improvement, partial improvement and no improvement.

Results: In 8 patients (80%) improvement was good, whereas improvement was partial in 1 patient (10%), and there was no improvement in 1 patient (10%). Granulation tissue formation around the polypropylene was seen in one patient.

Conclusion: Polypropylene can be used successfully in endoscopic dacryocystorhinostomy as an alternative to silicone stent. Polypropylene suture material is cheap, effective, and readily available in all operating theaters.

Keywords: Nasolacrimal duct obstruction, dacryocystorhinostomy, stent, polypropyl.

INTRODUCTION

Dacryocystorhinostomy (DCR) is a surgical procedure performed for the relief of nasolacrimal duct obstruction of either anatomical or functional cause. The first report of DCR (intranasal approach) was by Caldwell in 1893. DCR is indicated for saccal and post-saccal stenosis and is traditionally performed externally by Ophthalmologists. This procedure is based on the formation of a surgical fistula on the lateral nasal wall between the nasal cavity and the lacrimal sac. The operation can be carried out using either an external or endonasal surgical approach. The external approach is the surgery of choice for ophthalmologists. Since its first description by McDonough and Meiring, endoscopic DCR gained popularity.

Advances in endoscopic equipment have led to a widespread use of the endoscopic transnasal approach by Otorhinolaryngologists with results comparable to the external approach and the potential for less morbidity. The advantages of endoscopic DCR with respect to external DCR include the lack of skin incision, short operating time, and lower risk of interfering with the physiological lacrimal pump mechanism, minimal blood loss and the possibility to correct associated intranasal pathological conditions during the same procedure.

We describe a technique using a polypropylene suture material as an alternative to silicone stent in endoscopic DCR procedures. Polypropylene is commonly used in all surgical disciplines for suturing and meshing purposes. It is a cheap material and is readily available when compared with bicanalicular silicone tube.

Affiliations:
*,**, Otorhinolaryngology department, Bangalore Medical College & Research Institute, Bangalore, India

Address of Correspondence:
B. Viswanatha, MS, PhD, FACS
Professor of ENT, Bangalore Medical College & Research Institute Bangalore, INDIA
Email: dr bvswanatha@yahoo.co.in
Mobile no: 919845942832
PATIENTS AND METHODS:

This prospective study was done at the tertiary care institute between 2009 and 2014. In this study there were ten patients (6 females and 4 males) who underwent revision endoscopic DCR operations for complaints of continuous epiphora and recurrent swelling near the medial canthus after previous DCR surgery. Patients’ ages ranged from 26 to 50 years. Informed consent was obtained from the patients. All patients underwent routine preoperative ophthalmologic and otorhinolaryngological examination, diagnostic nasal endoscopy and blood investigations. Lacrimal sac or nasolacrimal duct obstruction was confirmed by the results of lacrimal irrigation.

SURGICAL TECHNIQUE:

All surgeries were performed under local anesthesia. The nasal cavity was decongested for 15 minutes using cottonoid pledgets soaked in lidocaine 4% with adrenaline 1:100,000. Patients were given premedication. Inside the operating room, cottonoid pledgets were removed from the nasal cavity. Using nasal endoscope, 2% lidocaine with adrenaline anesthetic solution was injected submucosally to the lateral nasal wall corresponding to the sac location just anterosuperior to the insertion of the middle turbinate.

A curved incision was made at the lateral nasal wall mucosa including periosteum, just anterior to the attachment of the middle turbinate. A suction Freer’s elevator was used to lift the mucosal flap, keeping the mucosa between the middle turbinate and the lateral nasal wall intact. Identification of the sac was aided by passing a lacrimal probe through the inferior canaliculus into the sac, or by pressing on the skin inferior and medial to the medial canthus and observing the movement of the sac. Vertical incision is made on the medial wall of the sac and it was widened using cutting punch forceps. The patency of the lacrimal drainage system was checked with saline irrigation.

Lacrimal punctum was dilated using punctum dilator. Then 2/0 polypropylene was inserted into the sac through both the canaliculi. Both ends of the polypropylene were then fastened with several knots. Precaution was taken to ensure that the polypropylene stayed loose in the region of the inner canthus to prevent canalicular laceration.

POSTOPERATIVE FOLLOW-UP:

The patients were discharged on the next day of the procedure after removing the nasal pack, and given oral antibiotics for 1 week. Nasal irrigation and topical eye drops were given four times a day for 2 weeks. Patients were examined endonasally in the otolaryngology clinic in first, second, and fourth week in the first month. Nasal endoscopy was done once a month until the stent removal. The polypropylene stent was removed at the end of 3 months.

The eyes with no epiphora were accepted as good improvement. The eyes which experienced epiphora occasionally were designated partial improvement. The eyes that still had epiphora were placed in the no improvement group.

Patency of the lacrimal system was assessed by rigid nasal endoscopy and irrigation with saline.
resolution of epiphora with patent ostium during nasal endoscopy at the end of three months was accepted as a successful result.

RESULTS:

The age range of our patients was between 26 to 50 years. There were 10 patients who underwent revision endoscopic DCR procedures. The patients were followed for a period for 6 months. Success was defined as anatomical patency with lacrimal syringing and improvement of the epiphora complaint at the end of 3 months.

Eighty (80%) were in the good improvement group, One patient had partial improvement and one patient had no improvement. When the patency of ostium and resolution of epiphora were taken into account; the endoscopic revision DCR was successful in 8 out of the 10 cases (80%). One patient had partial improvement. The procedure was unsuccessful in one patient who presented with the complaint of epiphora and evaluation revealed total closure of rhinostomy opening after the removal of polypropylene stent. There were no major surgical complications.

DISCUSSION:

Endoscopic DCR is proposed to be an alternative surgery to the external DCR operation in cases of chronic dacryocystitis. With the introduction of high resolution endoscopes, endoscopic endonasal DCR has begun to gain popularity. Endoscopic DCR is becoming popular as a relatively quick and easy surgery for post-saccal obstruction of the nasolacrimal drainage system. Closure of the rhinostomy opening was considered a major factor for surgical failure in external DCR. Thus, insertion of silicone stents is almost universally employed to prevent rhinostomy stenosis and to help to stabilize epithelialization between two mucosal surfaces having surgical continuity. Many surgeons may not prefer the stents if the patient has not had a previous operation (external DCR) and if they are available for regular postoperative visits. Some studies have shown that silicone stent itself is a reason of surgical failure due to granulation tissue formation and complications like punctual erosion and slitting of canaliculi.

The success rate depends on providing a wide intranasal stoma with removal of adequate bone around the stomal area, reducing the chances of postoperative stenosis and adhesions. Inadequate bone removal is the commonest cause of postoperative stomal stenosis. A bicanalicular silicone tube is the stent most often used in DCR procedures to prevent obliteration of the rhinostomy opening after DCR.

In 1967, Gibbs used silicone tubes in DCR for the first time. Later, Keith and Quickert and Dryden added probes to the silicone tubes. Many surgeons prefer to place bicanalicular silicone tubing to stent the intranasal ostium, with a high success rates.

In the literature, as an alternative method to silicone intubation, several other materials have been used to retain the lacrimal aperture following endoscopic DCR. Tamura et al used T-sheet made from a penrose drain tube in seven patients. In their study results were very good in four patients (57%), good in two patients (29%), and showed no change in one patient (14%). They detected granulation tissue in two of seven patients and reported spontaneous tube loss in the early period in 1 of 7 patients.

Kishore et al used standard otologic T-tubes in endoscopic DCR. Kim et al did not observe any granulation around the T-tube. In their study results were every good in 11 patients (50%), good in five patients (23%), and showed no change in six patients (27%). They reported spontaneous tube loss in the early period in 3 of 22 eyes and they did not observe any granulation around the T-tube.

According to guideline published by The Royal College of Ophthalmologists (1999) freedom from epiphora for 3 months after surgery is the marker of successful procedure. All our patients were under follow-up period of 3 months after the removal of polypropylene, and hence, our patients were under followed-up for 6 months. Resolution of epiphora and patent ostium after evaluation by irrigation were the signs of successful surgery.

In the present study, polypropylene was used as stents in endoscopic revision DCR operation in 10 eyes. Its strength, inertness, retention of strength after application, minimum tissue reactivity, and resistance
to bacterial contamination are its main advantages\(^7\). Polypropylene should be tied with multiple knots to prevent its prolapse. Granulation tissue around polypropylene in the nasal cavity was observed in only one patient. To the best of our knowledge, the use of polypropylene for DCR stenting has been reported only by Aslant et al\(^4\). This is the second prospective case series reported in the literature.

CONCLUSION:

In the present study the success of polypropylene stenting in endoscopic revision DCR procedures was 80%. This result was similar to that of the success rate of silicone intubation reported in the literature. When compared to silicon stents, polypropylene is a cheap material readily available in almost all operating theaters and it permits tear flow into the nose following surgery. It is a good alternative to silicone stents.

DISCLOSURES

(a) Competing interests/Interests of Conflict- None
(b) Sponsorships - None
(c) Funding - None
(d) No financial disclosures

REFERENCES: