

**Original article:**

## **Comparison of complications of external DCR and endonasal DCR surgery among the rural population**

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### **Abstract:**

**Introduction:** The future of lacrimal surgery is certainly changing and though external dacryocystorhinostomy still remains the gold standard by which other methods is measured, endonasal dacryocystorhinostomy has been gaining popularity as the preferred procedure over the last few years. There are very few prospective studies comparing the outcome of the two techniques. Therefore, this study was undertaken.

**Materials and methods:** The present study of “Prospective randomized comparative study of external Dacryocystorhinostomy surgery and endonasal Dacryocystorhinostomy surgery in a rural tertiary eye care centre” was conducted in Department of Ophthalmology, Rural Medical College, Loni.

**Results:** By applying Chi-square test there is a significant association between intra-operative complications of group A and group B ( $p < 0.05$ )

By applying Z test of difference between two proportions there is a significant difference between proportions of intra-operative complications such as epistaxis, lid edema, obstruction of rhinostomy site, wound discharge, synechiae, and no complications when group A was compared to group B ( $p < 0.05$ ).

**Conclusion:** Therefore, after studying our observations and comparing with other studies we concluded that both the procedures represent good alternative for the treatment of lower lacrimal passage obstruction.

**Keywords:** lacrimal surgery, dacryocystorhinostomy

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### **INTRODUCTION**

With the recent introduction of endoscopes and microscopes, the original procedure of external dacryocystorhinostomy with extensive dissection have been questioned by some surgeons which has led to interest in less invasive procedures like endonasal endoscopic dacryocystorhinostomy. **Mc Donogh and Meiring<sup>1</sup>(1989)**, were the first to describe the technique of endoscopic intranasal dacryocystorhinostomy. The major advantages being

avoidance of cutaneous wound, and limited tissue dissection and co-existing nasal pathology can be dealt simultaneously in the same operation. However, complete visualization, removing of lacrimal bone and control of excessive bleeding were the major problems unsolved with endonasal endoscopic dacryocystorhinostomy.

The future of lacrimal surgery is certainly changing and though external dacryocystorhinostomy still remains the gold standard by which other methods is

measured, endonasal dacryocystorhinostomy has been gaining popularity as the preferred procedure over the last few years. There are very few prospective studies comparing the outcome of the two techniques. Therefore, this study was undertaken.

**MATERIALS AND METHODS**

The present study of “Prospective randomized comparative study of external Dacryocystorhinostomy surgery and endonasal Dacryocystorhinostomy surgery in a rural tertiary eye care centre” was conducted in Department of Ophthalmology, Rural Medical College, Loni .

Patients attending ophthalmology outpatient department at Rural Medical College, Loni, for the symptom of epiphora and diagnosed as primary acquired nasolacrimal duct obstruction or chronic dacryocystitis.

**Inclusion criteria:**

All symptomatic epiphora cases diagnosed for primary acquired nasolacrimal duct obstruction or chronic dacryocystitis.

**Exclusion criteria:**

Following patients were excluded from study

- 1) Canalicular and punctal obstruction
- 2) Failed cases of dacryocystorhinostomy
- 3) Ectropion/ entropion/ lower lid laxity
- 4) Post traumatic bone deformity of lacrimal region
- 5) History of radiation therapy of lacrimal region
- 6) History of sino nasal malignancy and granulomatous conditions
- 7) Atrophic rhinitis

**OBSERVATIONS AND RESULTS**

**Intra operative complications in group A:**

In our series, the most common intra operative complication was bleeding, which was moderate in 9 cases (30%) and was severe in 4 cases (13.33%).

In 2 cases (6.66%) the sac was damaged accidentally while making flaps.

In 2 cases (6.66%) damage to nasal mucosa occurred.

**Table No.1: Intra operative complications in Group A:**

Intra operative complications	Group A (n=30)
	No. (%)
Damage to nasal mucosa	2(6.66%)
Damage to sac	2(6.66%)
Minimum bleeding	2(6.66%)
Moderate bleeding	9(30%)
Severe bleeding	4(13.33%)
Nil	11(36.66%)
Total	30

**Intra operative complications in group B:**

In this group the most common intra operative complication was bleeding, in 9 cases (30%) it was moderate and in 1 case (3.33%) it was severe.

In 3 cases (10%) accidental entry were made into the anterior ethmoid air cells.

In 3 cases (10%) entry were made into the orbital area other than the sac.

In 2 cases (6.66%) there were accidental trauma to uncinata process, and in 2 cases (6.66%) middle turbinate was traumatized.

Resection of the middle turbinate was done in 1 case (3.33%) and false passage was created in 1 case (3.33%).

**Table No.2: Intra-operative complications in Group B:**

Intra operative complications	Group B (n=30)
	No. (%)
Entry into ethmoid	3 (10%)
Entry into orbit	3 (10%)
False passage	1 (3.33%)
Moderate bleeding	9(30%)
Resection of middle Turbinate	1 (3.33%)
Trauma to middle Turbinate	2 (6.66%)
Severe bleeding	1 (3.33%)
Trauma to uncinata	2 (6.66%)
Nil	8 (26.66%)
Total	30

**Post operative complications:**

**In group A**

In our study, lid edema and tenderness was noted in 4 cases (13.34%) and epistaxis was noted in 3 cases (10%) on 1<sup>st</sup> post operative day. On follow up, 2 cases (6.66%) had obstruction at rhinostomy site on endoscopic examination and 1 case (3.33%) had discharge from the wound.

**In group B**

In this group, 5 cases (16.66%) had lid edema and tenderness and 4 cases (13.34%) had epistaxis on 1<sup>st</sup> post operative day. On follow up, 3 cases (10%) had synechiae formation between the lacrimal sac flap and nasal mucosal flap on endoscopic examination.

**Table No.7: Post operative complications in Group A and Group B:**

Post operative complications	Group A (n=30)	Group B (n=30)
	No. (%)	No. (%)
Epistaxis	3(10%)	4(13.34%)
Lid edema	4(13.34%)	5(16.66%)
Obstruction at rhinostomy site	2(6.66%)	0
Wound discharge	1(3.33%)	0
Synechia	0	3(10%)
Nil	20(66.67%)	18(60%)
Total	30	30

**Value of  $\chi^2 = 17.12$ , d.f. = 5, significant,  $p < 0.05$**

By applying Chi-square test there is a significant association between intra-operative complications of group A and group B ( $p < 0.05$ )

By applying Z test of difference between two proportions there is a significant difference between proportions of intra-operative complications such as epistaxis, lid edema, obstruction of rhinostomy site, wound discharge, synechia, and no complications when group A was compared to group B ( $p < 0.05$ ).

**DISCUSSION**

**Group A (external dacryocystorhinostomy):**

In our study, the major complications in both the groups were haemorrhage, which was encountered in 25 cases (41.66%). In group A, it was minimum in 2 cases (6.66%), moderate in 9 cases (30%) and was severe in 4 cases (13.33%). Minimum and moderate bleeding was seen during the punching of the lacrimal bone as well as while making nasal mucosal flaps. The bleeding was stopped by packing the area with the ribbon gauze soaked in 4% lignocaine with adrenaline for some minutes.

4 patients had severe bleeding while making skin incision due to injury to angular vein, which may have been due to varied anatomical position.

Haemostasis was achieved with clamping and ligating the vein and surgery was continued.

In external dacryocystorhinostomy, though majority of operative interventions go well, most of them are complicated by haemorrhage creating difficulties<sup>71</sup>. So it is clear from these words that the most common but major complication of external dacryocystorhinostomy surgery is bleeding.

**Hartikainen et al<sup>3</sup>** did not observe any intra-operative bleeding as troublesome in his study. However, he observed that there was accidental entry to anterior ethmoidal air cells in 6 cases (9%) while doing osteotomy. In our study, there was no such complication seen in group A.

Other minor complications in group A were damage to the lacrimal sac while making flaps and damage to nasal mucosa, while trephining the lacrimal bone.

**Group B (endonasal dacryocystorhinostomy):**

Our study showed 9 cases (30%) with moderate bleeding and 1 case (3.33%) with severe bleeding. Haemostasis was achieved by packing the area with gauze soaked in 4% lignocaine with adrenaline for few minutes. Visualization was the problem in these cases.

In our study, accidental entry were seen into the ethmoids and orbit in 3 cases (10%) each. **Hartikainen et al**<sup>3</sup> encountered the ethmoidal sinuses in 7 cases (22%) while doing the endonasal dacryocystorhinostomy surgery. When compared to this, our study has low incidence of entry into ethmoidal air cells.

In our study, 1 patient required resection of the anterior part of middle turbinate because it was hypertrophied and was obscuring the endoscopic view as the sac was located posteriorly.

**Rebeiz et al**<sup>4</sup> in his study, noticed that during the endonasal procedure, the removal of the anterior end of the middle turbinate was helpful to expose the sac area, to locate the sac and to decrease the risk of scarring and fibrosis after the operation.

In group B, the minor complications encountered were trauma to uncinat process in 2 cases (6.66%), trauma to middle turbinate in 2 cases (6.66%) which were related to the improper handling of the endoscopic instruments and creation of false passage was seen in 1 case (3.33%).

#### **Post operative complications:**

##### **Group A (external dacryocystorhinostomy):**

In group A, 3 cases (10%) had epistaxis on 1<sup>st</sup> post operative day and 4 cases (13.34%) had lower lid edema and tenderness which were resolved by nasal packing and medical treatment. On follow up, 2 cases (6.66%) had obstruction at rhinostomy site on endoscopic examination by the blood clots. 1 case (3.33%) had developed suture abscess and discharge from the wound. Patient was given antibiotics and anti-inflammatory and the patient responded very well. **Tarbet et al**<sup>5</sup> have reported a rate of 2.6% for excessive scarring post operatively and a rate of 3.9% for post operative haemorrhage. In our study, post operative haemorrhage was seen in 7 cases (11.66%)

which is higher as compared to the study done by **Tarbet et al**.

**Waland et al**<sup>6</sup> have reported 1.6% incidence of infection after open lacrimal surgeries. Our study correlates well with the study done by **Waland et al**.

##### **Group B (endonasal dacryocystorhinostomy):**

In group B, 4 cases (13.34%) had epistaxis on 1<sup>st</sup> post operative day and 5 cases (16.66%) had lower lid edema and tenderness which were resolved by nasal packing and medical treatment. 3 cases (10%) showed synechiae formation which were detected on nasal endoscopy post operatively. Synechiae was released under endoscopic guidance in the same sitting. No other complication was noticed.

Post operatively out of 16 cases **Nayak et al**<sup>7</sup> had 3 cases (18.75%) of synechiae formation and 2 cases (12.5%) had granulation tissue in the operated area which were successfully treated endoscopically as an office procedure. In our study the number of cases showing synechiae formation post operatively was very low (10%) as compared to this study.

##### **Group B:**

On repeat endoscopic examination, 3 patients (10%) showed obstruction at rhinostomy site by granulation tissue formation and narrow bony ostium. All of them were advised revision endoscopic surgery. Study by **Kuldeep Moras et al**<sup>8</sup> had showed the obstruction at the rhinostomy site in 2 cases (10%). Study by **A Tsirbas** and **P J Wormald**<sup>9</sup> had showed scarring of the osteotomy in 5 cases that led to the failure of the surgery.

Postoperative scarring at the site of the rhinostomy is one of the major causes of DCR failure<sup>43</sup>.

Our study correlates well with the other studies.

6 patients (20%) showed synechiae formation between the lacrimal sac flap and nasal mucosal flap.

Ostium could not be visualised. The synechiae were so extensive that probe could not enter the meatus.

Study by **Kuldeep Moras et al**<sup>10</sup> had showed the synechiae formation in 1 case (5%).

**Passorn Preechawai**<sup>11</sup> in their study had found that 3 cases (7.1%) out of 42 who had failed results showed fibrosis at the nasal mucosa. Our study correlates well with the other studies.

Patients were advised to undergo repeat endonasal dacryocysto-rhinostomy surgery.

### **CONCLUSION**

Therefore, after studying our observations and comparing with other studies we concluded that both the procedures represent good alternative for the treatment of lower lacrimal passage obstruction.

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