

# Probing under Local Anesthesia for Congenital Nasolacrimal Duct Obstruction

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## Abstract

**Background:** Obstruction of the nasolacrimal duct is the most common abnormality of the lacrimal system in childhood leading to epiphora. It is found in about 20% of newborns. If not treated in time, it may be complicated by recurrent conjunctivitis, chronic dacryocystitis, and lacrimal abscess formation.

**Objectives:** To study the outcome and complications of probing for congenital nasolacrimal duct obstruction under local anesthesia.

**Materials and Methods:** In this hospital based prospective interventional study, probing was done under topical anesthesia (lidocaine 4%) in 100 patients (124 eyes) in the age group of 6 months to 12 months, over a period of 2 years in which conservative treatment with antibiotic drops and sac massage had failed.

**Results:** Success rate of this procedure was 93.5% with first and 96.8% after second probing without any untoward complication.

**Conclusion:** Probing under topical anesthesia is a safe, quick and convenient method of treatment for congenital nasolacrimal duct obstruction.

**Key words:** Anesthesia, Dacryocystitis, Nasolacrimal duct

## INTRODUCTION

Obstruction of the nasolacrimal duct is the most common abnormality of the lacrimal system in childhood. It is found in about 20% of newborns, but only 1-6% of these children become symptomatic.<sup>1,2</sup> The obstruction is mostly due to membranous occlusion at the lower end of the duct, near the valve of Hasner.<sup>3</sup> Other causes of congenital nasolacrimal duct block are the presence of epithelial debris, membranous occlusion at its upper end near lacrimal sac, complete non-canalization and rarely bony occlusion.<sup>4</sup> If not relieved, it leads to epiphora and dacryocystitis. The epiphora usually presents after 7 days of birth and is

followed by mucopurulent discharge from the eyes along with conjunctival hyperemia and crusting of eyelid margins.<sup>5</sup> The regurgitation test is usually positive, i.e. when pressure is applied over the sac area, purulent discharge regurgitates from the lower punctum, and eventually a swelling may appear over the sac area. If not treated in time, it may be complicated by recurrent conjunctivitis, acute or chronic dacryocystitis, lacrimal abscess, and fistulae formation.<sup>6</sup>

Fortunately, nasolacrimal duct obstruction clears spontaneously with time; about 89-96% of congenitally obstructed ducts open by 1-year of age.<sup>1,7,8</sup> During this period, conservative treatment with local massage over the lacrimal sac area combined with topical antibiotic drops may be used as needed for control of infection.<sup>8,9</sup> The rest of the cases which do not respond to conservative treatment are advised syringing and probing. Probing is time proven treatment of congenital nasolacrimal duct obstruction.<sup>10</sup> Results of probing are excellent and if performed properly, a single probing is successful in 70-96% of cases with many reports around 90%.<sup>11-17</sup>

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Most of the studies advise probing under general anesthesia to reduce the potential for trauma to delicate structures of the lacrimal drainage system.<sup>18-20</sup> Though it is convenient for the surgeon, it has its own problems such as fear of general anaesthesia, 1-day hospitalization, about 8 h of fasting and preparation of the child for general anaesthesia. Due to these reasons, the parents generally avoid this procedure and instead go on changing the doctors. Some authors also preferred topical anesthesia for probing in children <12 months of age for its ease of performance and avoidance of general anesthesia.<sup>13,17,21</sup> In view of above reasons, we had undertaken this study to perform probing under topical anesthesia and studied its safety, success rate and complication.

## MATERIALS AND METHODS

This hospital based prospective interventional study was undertaken in the upgraded Department of Ophthalmology, Government Medical College, Jammu over a period of 2 years from 1-1-2013 to 31-12-2014. 100 patients (124 eyes) in the age group of 6 months to 12 months, in whom conservative treatment had already failed, were included in this study. The parents were advised to use antibiotic drops and sac massage for at least 15 days before taking the child for probing.

The surgical procedure in the form of probing was done under topical anesthesia after obtaining informed written consent from the parents. Lidocaine 4% topical drops were instilled in the eye of the patient 3 times before the procedure. The child was then taken to Operation Theater. His legs were wrapped in a towel and his head was immobilized by holding his arms on the sides of his head. The lower punctum was dilated with punctum dilator under the microscope, and Bowman #00 or #0 probe was passed through the passages. The probe was first passed vertically through the punctum and then shifted horizontally through the canaliculus until the lacrimal bone was felt. The lower lid was pulled laterally while passing the probe through the lower canaliculus. With the tip on the bony wall, the probe was shifted to inferior, posterior and lateral position. After passing the probe for about 8-10 mm, a resistance of the membrane was usually met. Applying direct pressure on the probe creates an opening in the membrane. The probe was then removed after 5 min.

Post-operatively, the patient was given steroid-antibiotic eye drops QID and saline nasal drops BD for 4 weeks, and decongestant oral drops for 2 weeks. He was examined again on 2<sup>nd</sup> day, after 1-week, 2 weeks, 4 weeks and 6 weeks. Cure was defined as complete remission of watering, discharge and reflux of contents of the lacrimal sac. If after 6 weeks, there is no improvement repeat probing was done.

## RESULTS

Out of 100 patients in the study group, 63 (63%) were of the age group of 6-9 months and 37 (37%) of 9-12 months (Table 1). Of 100 patients, 54 (54%) were males and 46 (46%) were females (Table 2). 76 (76%) were affected unilaterally, out of which left eye was affected in 43 patients (43%) and right eye in 33 patients (33%). Both eyes were affected in 24 patients (24%) (Table 3).

Out of 124 eyes, 116 improved with single probing, obtaining a success rate of 93.5%. Four more eyes (3.2%) were improved with second probing thus obtaining a total success rate of 96.8% (Table 4). Third probing was not tried in the rest of the cases (4 eyes).

Complications such as a punctal tear, false passages, ecchymosis or excessive bleeding from the nose were not seen during this study.

## DISCUSSION

Probing is the method of choice for the treatment of congenital nasolacrimal duct obstruction who fail to respond to conservative treatment. In this prospective study, a total of 124 eyes of 100 children between 6 months

**Table 1: Age distribution of patients**

Age group	Number of patients	Percentage
6-9 months	63	63
9-12 months	37	37
Total	100	100

**Table 2: Sex distribution of cases**

Sex	Number of cases	Percentage
Males	54	54
Females	46	46
Total	100	100

**Table 3: Predominance of eye affected**

Eye affected	Number of patients	Percentage
Right eye	33	33
Left eye	43	43
Both eyes	24	24
Total	100	100

**Table 4: Results of probing**

Probing	Number of eyes	Percentage
Improved with single probing	116	93.5
Improved with two probing	120	96.8
Not improved	04	3.2

and 1-year of age were treated by probing under topical anesthesia.

In our study, out of 124 eyes, 116 eyes were cured by the first probing. It gave a success rate of 93.5%. The present study is comparable to studies conducted by Robb<sup>11</sup> who reported a success rate of 90%, and El-Mansoury *et al.*<sup>12</sup> who reported 93.5% cure rate after the first probing. Similarly, Stager *et al.*<sup>13</sup> reported a 94% cure rate in patients <9 months of age with one office probing under topical anesthesia and Katowitz and Welsh<sup>14</sup> noted a success rate of 96% in children between 6 and 13 months of age. In another study, Baker<sup>15</sup> reported 860 eyes of children aged 3-14 months of age, probed in office without general anesthesia and 94% were cured with initial probing. Kushner<sup>16</sup> probed 148 eyes at an average age of 8 months and reported that 89% of eyes were relieved of the symptoms by one probing, whereas Shrestha *et al.*<sup>17</sup> reported a success rate of 92.7% with first attempt of probing in the age group of 7-12 months under topical anesthesia. Perveen *et al.*<sup>22</sup> reported a cure rate of 100% in the age group of 4-6 months and 94% in the age group of 7-12 months. Similarly, Medghalchi *et al.*<sup>23</sup> reported a 91% cure rate in patients aged 9-12 months of age, and Isaza and Arora<sup>24</sup> noted a success rate of 90.2% (46/51 eyes) in children <2 years of age.

In our study, four more eyes were improved with second probing thus obtaining a total success rate of 96.8%. This percentage was comparable to studies done by other authors.<sup>11,17</sup> The third probing was not tried in the remaining 4 cases. The cause of failure in the 4 cases could be either scarring due to chronic infection, anatomical abnormalities of duct or bony occlusion.

Some authors advised to delay the probing until the age of 1-year as spontaneous opening occurs in 89-96% of cases by 1-year.<sup>17,8</sup> However delaying probing for such period may cause agony to the parents of the child, increase the risk of complications due to chronic dacryocystitis and decrease the success rate of probing as reported by various studies. Robb<sup>11</sup> reported a success rate of 84% with probing after 12 months of age and Katowitz and Welsh<sup>14</sup> noted a success rate of 77% after 13 months of age. Due to these reasons, we advise probing after 6 months of age. Also, it is easy to perform probing in younger children under topical anesthesia.

In this study, all probing were performed under topical anesthesia. Some authors recommended that the probing procedure should be done under general anesthesia to reduce the potential for trauma to delicate structures of the lacrimal drainage system. Koke<sup>18</sup> reported that probing is not an office procedure and that general anesthesia is

essential. Honavar *et al.*<sup>19</sup> did all probing procedures under general anesthesia in their studies. Similarly, MacEwen<sup>20</sup> performed probing in children under general anesthesia so that the procedure could be controlled, and attention paid to the site and the nature of the obstruction. El-Mansoury *et al.*<sup>12</sup> recommended probing after 13 months of age under general anesthesia. Though it is convenient for the surgeon, it has its own disadvantages such as fear of general anesthesia, 1-day hospitalization, about 8 h of fasting and complications of general anesthesia.

Probing under topical anesthesia, though appears quite difficult due to the unpredictable mobility of the child, is quite easy and safe. Also, it is of shorter duration and free from complications of general anesthesia. Its other advantages are compliance of the parents is more as there is no fear of general anesthesia, hospital stay is less i.e. only 30 min to 1 h as compared to 1-day in general anesthesia and no pre-operative preparation or fasting is required. Stager *et al.*,<sup>13</sup> Shrestha *et al.*,<sup>17</sup> Basar *et al.*<sup>21</sup> and Schnall<sup>25</sup> also preferred topical anesthesia for probing in children <1-year of age for its ease of performance and avoidance of general anesthesia.

Complications such as punctum tear, false passages, ecchymosis, excessive bleeding which were expected due to the unpredictable mobility of the child were not faced during this study.

## CONCLUSION

Probing under topical anesthesia is a safe, quick and convenient method for the treatment of congenital nasolacrimal duct obstruction. The success rate of this procedure was 93.5% with first and 96.8% after second probing without any untoward complication.

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