SILICONE TUBE INTUBATION IN ADULTS WITH NASOLACRIMAL DUCT OBSTRUCTION AND IN CHILDREN WITH FAILED PROBING

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ABSTRACT

BACKGROUND

Nasolacrimal duct obstruction will lead onto dacryocystitis. This may occur in neonates and children and also. In adults it usually has a chronic course which may end in procedures like Dacryocystorhinostomy (DCR). These procedures have significant failure rate.

MATERIALS AND METHODS

With the advent of bio-inert silicone material, silicone intubation is gaining popularity as an alternative, minimally invasive procedure in the treatment of acquired NLD obstruction. This prospective case study analyses the effectiveness of silicone intubation in adults with nasolacrimal duct obstruction and in children with failed probing or presenting late.

RESULTS

Silicone tube intubation is a simple, safe, minimally invasive and effective alternative to traditional external DCR in the surgical management of nasolacrimal duct obstruction in adults. The procedure is ideal for children with failed probing and in those presenting with dacryocystitis in late childhood.

CONCLUSION

Silicone tube intubation is a simple, safe, minimally invasive and effective alternative to traditional external DCR in the surgical management of nasolacrimal duct obstruction in adults.

KEYWORDS

Nasolacrimal Duct Obstruction (NLD), Dacryocystorhinostomy (DCR), Probing, Silicone, Intubation.

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BACKGROUND

The lacrimal drainage system is a continuous membranous channel.[1-3] The most common site of anatomical obstruction is at the level of nasolacrimal duct. Nasolacrimal duct obstruction may lead on to stasis of lacrimal secretion in lacrimal sac which in turn lead to infection of the lacrimal sac. This will result in acute dacryocystitis or chronic dacryocystitis. In children the blockage of nasolacrimal duct will lead to congenital dacryocystitis. The definitive treatment for acquired Nasolacrimal Duct (NLD) obstruction is surgery. The various surgical options available are external Dacryocystorhinostomy (DCR), Dacryocystectomy (DCT), Conjuntivodacryocystorhinostomy and Endonasal DCR.[4,5] With the advent of bio- inert silicone material, silicone intubation is gaining popularity as an alternative, minimally invasive procedure in the treatment of acquired NLD obstruction.[6-8] This prospective case study analyses the effectiveness of silicone intubation in adults with nasolacrimal duct obstruction and in children with failed probing or presenting late.

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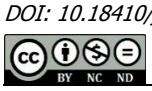

Aim of Study

Aim of the study is to find out the outcome of silicone tube intubation in adults and in children with failed probing or presenting with late NLD obstruction.

MATERIALS AND METHODS

Patients with acquired nasolacrimal duct obstruction were selected at random from among those attending the Ophthalmology outpatient department during the period of one year. A thorough ophthalmic evaluation was done and functional causes of epiphora ruled out. Slit lamp examination was conducted to rule out punctal stenosis, canaliculitis and punctual concretions. Lacrimal irrigation, Jone's test and dye disappearance test were done. Above all, a detailed ENT examination was conducted to evaluate any underlying nasal pathology. The inclusion criteria consisted of watering with complete nasolacrimal duct obstruction, partial nasolacrimal duct obstruction, failed probing in children or presenting late. Congenital nasolacrimal duct obstruction in children below one year,

punctal stenosis, canalicular obstruction, specific infections of lacrimal sac, rhinosporidiosis, malignancy of the sac, atrophic rhinitis, lid abnormalities, ocular surface disorders, mass lesions in the nasal cavity were excluded from the study. The surgical procedure has been described below. Postoperative management included broad spectrum systemic antibiotic for 5 days, nasal decongestants, antihistamines, steroid antibiotic eye drops tapered over 2 weeks. The silicone tube is removed after 2 months. Syringing were done on 2 months, 3 months, 6 months, and at 1 year follow up. The complications encountered were grouped as early (< 6 wks.) and delayed (>6 wks.).

Careful nasal preparation is essential for good vasoconstriction and anaesthesia. A cotton applicator is soaked in 4% xylocaine and adrenaline (1:1000) with excess solution removed is inserted under vision into the nasal cavity. Care is taken not to injure the mucosa especially around inferior turbinate and medial wall of nose or nasal septum. It is retained for 10 minutes. 2% xylocaine with adrenaline injected 3mm medial to medial canthus. In addition, the supra orbital and infra orbital block was also given. Conjunctival sac is anaesthetised with a few drops of 4% xylocaine. Extreme care is taken in every manipulation in the nasal cavity so as not to injure the mucosa because it is very richly vascular, and it can produce severe bleeding and mucosal oedema.

Both puncta are dilated with Nettleship's punctum dilator. The probing is done with Bowman's probe which is first introduced vertically and then by stretching the lids horizontally it is advanced till it touches the hard stop. The probe is rotated 90° and introduced towards the direction of nasolacrimal duct i.e. downwards, backwards, and laterally. Using a Killian's nasal speculum see the end of the probe through the opening of the nasolacrimal duct i.e. situated 1.5 cm behind the lower end of inferior turbinate in the inferior meatus. Take out the Bowman's probe, introduce the probe of the silicone intubation set into the upper punctum and retrieve the probe & silicone tube through the nasal cavity. Repeat the procedure through the lower punctum and take out the tube through the nose. Remove the probe and tie each ends of the tube together, leave it in the nasal cavity or tape it over the ala of nose. After the procedure look for any anterior or posterior nasal bleeding. Haemostasis is achieved, nasal pack is given only in cases where there is bleeding and the pack is removed after 24 hours. The silicone tube is kept for 6 – 8 wks. and removed.

Observations

The study group included 40 eyes of 40 patients, 39 cases of primary acquired nasolacrimal duct obstruction (PANDO) and one case of secondary nasolacrimal duct obstruction (SANDO) following a trauma. All patients had symptoms of dacryocystitis. Age distribution is shown in figure-1.

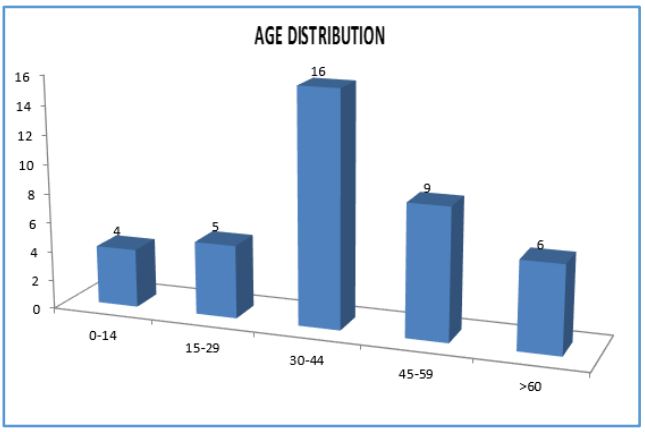

Figure 1. Age Distribution

The cases included chronic dacryocystitis without surgical intervention -34 cases (85%), failed external DCR – 2 cases (5%) and failed probing – 4 cases (10%). In the age group 0-14 years who presented with failed probing were all male patients. The male to female ratio in the age group 15- >60 years is 1:6 (6 M: 36F All patients had received prior therapy either medical or surgical during the course of their disease. The patients were followed up at regular intervals upto one year.

Out of 40 cases, 34 had anatomical and functional patency (85%); 6 patients had anatomical failure (15%). Out of 6 failures 3 undergone external DCR with 100% success. Out of 40 cases 4 were in the age group 0 - 14 years, of which 3 attained both anatomical and functional patency (75%), one developed mucocoele and recurrence of watering after one month. In the age group 15 – 29 years 5 cases, out of this 4 achieved anatomical patency (80 %) and one failed (20%). 30 – 44 years age group there were 16 patients, out of these, 14 cases gained anatomical and functional patency (87.5%) and 2 cases had failure (12.5%). There were 9 cases in the age group 45-59 years, among these 8 cases had anatomical patency (88.8%) and one case failed (11.1%). Above 60 years 6 patients were there, 5 attained patency (83.33%) and one developed failure (16.66%).

DISCUSSION

In this study, majority of the patients had primary acquired nasolacrimal duct obstruction (PANDO). Trauma was found to be causative factor for secondary nasolacrimal duct obstruction (SANDO). PANDO was found to be more among middle aged females. Increased predilection in women has been mentioned in literature. The theories proposed include smaller dimension of middle and lower nasolacrimal duct, changes in the antero-posterior dimensions of bony nasolacrimal duct with osteoporotic changes and hormonal fluctuations resulting in reepithelialisations within lacrimal sac and duct.[9] There were no bilateral cases and no family history or predisposing factors. The deviated nasal septum and hypertrophied inferior turbinate (DNS & HTIT) were noticed in majority of patients (72.5%), and this restricted the surgical space while retrieving the silicone tube intra-operatively. The basic principle behind the silicone

intubation is recanulating the normal anatomical passage with a probe and keeping the bio-inert silicone tube for a period of time so that it forms a track and relieves the obstruction. In the present study, after the primary procedure out of 40 cases, 34 had both anatomical and functional patency (85%) and 6 had failure (15%). Out of 6 cases of failure 3 cases undergone external DCR and one case missed for the follow up. One case with failed probing after silicone intubation developed mucocoele and advised external DCR.

In this study period a lot of difficulties were encountered like lack of proper instrumentations like nasal endoscope, retrieval forceps and silicone intubation set. We used the otoscope to visualise the probe and tube in the nose because nasal mucosa is a very vascular tissue so any manipulation with instruments can produce mucosal oedema and bleeding that can finally alter the anatomy of nasal cavity. The complications included orbital cellulitis in one patient on the first postoperative day and canalicular tear due to stretching of the tube in one patient. The silicone intubation tried in children with failed probing with a success rate of 75%. Various authors have reported 90 – 100 % result in children with congenital nasolacrimal duct obstruction.[10-16] In this study the success rate in adults is 84.9%. In literature the success rate in adults varies from 60% to 75.9% depending on the period of follow up. In seven years follow up study in adults by Connell had reported 50.3% success.[15] Usually the silicone tube was kept for long period (6 months-1 year) and followed up to several years in many studies. In our study it was kept for one to two months only and followed up to a maximum one and half years.

CONCLUSION

Silicone tube intubation is a simple, safe, minimally invasive and effective alternative to traditional external DCR in the surgical management of nasolacrimal duct obstruction in adults. The procedure is ideal for children with failed probing and in those presenting with dacryocystitis in late childhood. This technique is ideal in revision cases of external DCR. As the silicone tube is a bio inert material, it can be kept in situ for a long time as desired so that we can improve the result also. Advantages of this method include, no facial scar and preservation of the lacrimal drainage system intact. Silicone intubation was found to be free from major complications like CSF rhinorrhoea, orbital haematoma or delayed bleeding. All the complications met with were minor and transient which responded to conservative management.

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