

Original Research Article

Outcomes of intubation techniques in nasolacrimal duct blockage in adult age group: a comparative study based on Sindh, Pakistan population

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ABSTRACT

Background: Nasolacrimal duct obstruction is listed under the heading of congenital diseases; on other hand it is also commonly present in adult age group. In population of Sindh we found these patients frequently. Through this study we revealed the surgical options for the treatment of Nasolacrimal duct obstruction in population of Sindh provenience of Pakistan. The objective of the study was to compare the outcomes of two different intubation techniques in treatment of Nasolacrimal duct obstruction between two age groups. Comparative study was conducted in the Department of Ophthalmology Al-Ibrahim Eye Hospital Karachi from May 2018 to June 2019.

Methods: Total 136 numbers of patients were included on the bases of history, clinical examination and pre-operative syringing test. Non- probability convenient sampling was applied for data collection. Total 136 numbers of patients were divided into two groups on the bases of treatment and further subgroup on the bases of age ranges. Data were analyzed by SPSS version 20.0.

Results: Frequency and percentage of recovery in six months in each subgroup with application of chi-square test. Frequency and percentage of post-operative complications prolong treatment and regurgitation and patency of tube in each group and subgroups.

Conclusions: The results showed significant difference between the groups. Group A showed higher success rate with minimal percentage of complications and post-operative measurements in both age ranges as compare to Group B.

Keywords: Dacrocysto-rhinostomy, Nasolacrimal duct obstruction, Silicon tube

INTRODUCTION

Epiphora associated with multiple underlying causes such as trauma, radiotherapy, burn or drugs had wide contribution.¹ The silicon tube was mainly presented by keth. Who applied the procedure in patient with nasolacrimal duct obstruction as an alternative of commonly used skills.²

This advanced procedure not mainly applied for single use, also suitable for other conditions such as nasolacrimal duct stenosis even in congenital based conditions.³ Reported achievement rate of tube intubation is up to 83%.⁴ Follow up duration contribute in the success rate of procedure. Surgical skills can mimic the rate of failure.⁵ Early diagnosed cases showed higher achievement rate and low level of complication especially if the there is such past relevant surgical

history.⁶ Pre-operative lacrimal syringing test one of the success factor regarding this procedure. Information of these dynamics makes compatible way for surgeons to provide better suitable treatment plan for patients.⁷

Numerous surgical procedures and tools for stent application have been described in different studies. The sensible choice for stenting in lacrimal duct obstruction is silicone. Stents implanted within the nasolacrimal system avoid adherence of the mucosal lining of the ducts for the period of repairing and sustain longstanding patency.⁸ It was evidenced as the stent diameter is larger the chance of adherence will be decreases. Most applied silicon techniques are Crawford bicanalicular intubation, Quickert-Dryde technique or silicone intubation using a Nunchaku-style tube are on board. For the purpose of anastomotic pattern the Bicanalicular silicon is well applied for the treatment it is an un-established fact regarding long term efficacy of silicon intubation in adult based obstruction cases.⁹ According to the some studies the double silicon intubation having better outcomes in adult based obstruction with proper follow up.¹⁰ This procedure is quite low-cost with low chance of complication Double size silicon tube give higher rate of success Achievement ratio varies according to the thickness of tube. Scleral fixation can resolve the cases of epiphora.¹¹

METHODS

Experimental study was conducted at Post graduate institute of Al-Ibrahim eye Hospital. Karachi. From May 2018 to June 2019. After taken ethical approval from the institutional ethical review committee of Al-Tibri Medical College and Hospital total 136 patients were selected on the bases of convenient sampling. The sample size was calculated through sample size formula of cross sectional study. The total numbers of patients were taken from the province of Sindh. Pakistan and divided into two groups on the bases of two incubational surgical techniques. Group A were applied intubation of silicon tube alone and Group B were applied dacrocysto-rhinostomy (DCR) for the treatment of nasolacrimal duct obstruction in adults. Each group comprises of 68 numbers of patients that were further subdivided according to age ranges 20-40 and 41-60 years of age and each subgroup had 34 numbers of patients. After taken written inform consent with the patients and those with age range from 20-60 years of both genders were included in this study on the bases of positive syringing test and clinical examination. Those patients had a history of congenital obstruction, age less than 20 or more than 60 years, recurrent cases, patient with traumatic history, patients with symptoms secondary to any underlying pathology, glaucoma, tumors of eyelid, secondary cases of nasolacrimal duct obstruction like fracture of facial bones and other ocular surface disorders were excluded from the study on the bases of previous ocular history, past records, visual acuity, slit lamp examination and eye lid examination. In some of the cases the schirmer I and

II tests, jones test I, dye disappearing test, tear break-up time and fluorescein staining were performed under local anesthesia to identify the level of obstructions.

Surgical techniques: Group A Silicon tube intubation procedure for treatment of blockage, this procedure was performed under local anesthesia and its a less invasive and simple technique. In Group B another surgical technique was performed, it was done under local anesthesia and invasive method. This technique was prolonged and complicated. In Group A postoperatively the patients were kept on oral antibiotic for a week, pain management therapy for a week. Topical antibiotic eye drops quarterly for one month and continue accordingly for six months. Tube was removed at 6th month follow up. Only to follow up required first at one week and last at 6th month. In Group B the patient were kept under observation for 24 hours to overcome the post-operative trauma, the patient was kept on oral antibiotic for 10 days. Anti-inflammatory medicine for 10 days and topical eye drops mainly up to 6th month's Post-operative treatment was followed by follow up of 7 days, 1st, 3rd month and 6th month with removal of tube and sutures.

Surgical procedure

Silicon tube intubation

In group A the Intubation procedures of blocked nasolacrimal duct performed by same surgeon. That was less invasive and easier to perform than DCR surgery. All patients in this study were performed under local anaesthesia, as this procedure is a less traumatic and well tolerated by the patients. The both (superior and inferior) punctal opening was dilated with probe. Then bowman probe was passed vertical 2mm and then horizontal through the canalicular system and directed inferiorly until a distinct bony feeling "hard stop" was encountered in sac area. The bowman probe sizes ranging from 0.7mm to 1.1 mm. Probe passed down the nasolacrimal duct to enter the nasal cavity under the inferior turbinate. A fine silicon tube attached to malleable metal rod was then introduced through both upper and lower punctal openings and canaliculi to bring out using a Crawford hook to engage the bowman probe and take out the nostrils, now the nasal packing with gauze dripping in antibiotic ointment was applied and removed after an hour. Post-operatively all patients were kept for 2 hours and then started antibiotics, ointments, eye drops and anti-inflammatory medicines for a week. Follow-up was after a week, and then at 3rd and 6th month. The tubes were removed in the outpatient department by using topical anesthetic

Dacrocysto-rhinostomy (DCR) procedure

In group B Dacrocysto-rhinostomy (DCR) procedure with intubation of silicone tube were performed by same surgeon. All patients in this study were performed under local anaesthesia. A vertical superficial skin incision that

was made 10 mm medial to the inner canthal area with knife, securing the medial canthal tendon and lacrimal sac and was exposed after making osteotomy of the intervening bone the sac was incised in H shaped manner and attached to an opening created in the nasal mucosa. A silicon tube that was attached to flexible metal body was passed from both superior and inferior puncti and canaliculi to form a DCR incision. After suturing the posterior flaps, the tube ends were passed to the nose and come out the nostril, then anterior flaps were sutured along with skin. The tube was remains inside the nostril devoid of adhesive with nasal wall. General packing with gauze sopping with antibiotic ointment and pressure bandage was done.

Post-operative hospital stays of patients for a day, after removal of nasal pack the post-operative therapy was started with antibiotics, topical steroids and analgesics along with eye ointments and drops especially given quarterly. Sutures were removed after a week under topical anesthesia. Follow-up was sustained for 6 months for the assessment of abnormal finding, complications and patency.

Parameters: They are surgical success rate, frequency of postoperative complications, treatment, regurgitation and patency of lacrimal duct in both groups and subgroups.

Data analysis

Data was analyzed by SPSS version 20.0 through percentage and frequency of patients. Chi-square test was applied to evaluate the level of significance in success rate between the groups. Level of significance was taken <0.05.

RESULTS

Mean age of Group A age ranges between 20-40 was 34.5±5.8 and ages range between 41-60 was 54.3±6.32 as shown in Table 1. Mean age of Group B age ranges between 20-40 was 32.5±4.65 and age ranges between 41-60 was 52.4±7.65 as shown in Table 1.

Table 1: Mean±SD of demographic data of different groups.

Treatment Groups with age range	Age range	
Mean age	20-40	41-60
Group A	34.5±5.8	54.3±6.32
Group B	32.5±4.65	52.4±7.65

Frequency and percentage of patient improvement based on symptoms of patients within 6 months in Group A with age ranges of 20-40 with full recovery was 29(85.0%), partial recovery in(9.0%) and with no recovery 2(6.0%). age ranges of 41-60 full recovery showed by 27(79.0%), partial recovery in 5(1%) and no

recovery showed by 2(6.0%) of patients with p value (<0.001) as shown in Table 2.

Frequency and percentage of patient’s improvement base on symptoms of patients within 6 months in Group B with age range of 20-40 with full recovery in 19(56.0%), partial recovery in 11(32.0%) and no recovery was found in 4(12.0%). Now with age rages of 41-60 years full recovery showed in 17(50.0%), partial recovery in 13 (38.0%) patients and no recovery was found in 4(12.0%) of patients with p value (<0.001) as shown in Table 2.

Table 2: Frequency and percentage (%) of patient recovery within six months in groups with different age ranges.

Recovery in six months	Age range		p value	
	20-40	41-60		
Group A	Full	29(85%)	27(79%)	<0.001
	Partial	3(9%)	5(15%)	
	Null	2(6%)	2(6%)	
	Total	34(100%)	34(100%)	
Group B	Full	19(56%)	17(50%)	<0.001
	Partial	11(32%)	13(38%)	
	Null	4(12%)	4(12%)	
	Total	34(100%)	34(100%)	

Frequency and percentage of over all patients improvement in Group A based on symptoms of patients in both age groups within 6 months the full recovery was found in 56(82.0%), partial recovery in 8(12.0%) and no recovery was found in 4(6.0%) with p value (<0.001) as shown in Table 3.

Table 3: Frequency and percentage (%) of overall success rate within six months in different groups.

Overall rate of success	Group A	Group B	p value
Full	56 (82%)	36 (53%)	<0.001
Partial	8 (12%)	24 (35%)	
Null	4 (6%)	8 (12%)	
Total	68 (100%)	68 (100%)	

Frequency and percentage of over all patients improvement in Group B based on symptoms of patients in both age groups within 6 months the full recovery was found in 36(53.0%), partial recovery in 24(35.0%) and no recovery was found in 8(12.0%) with p value (<0.001) as shown in Table 3.

Frequency and percentage of patients showed post-operative complication in Group A with age range of 20-40 was 1(2.0%) and with age range of 41-60 2(5.0%). In Group B with age ranges 20-40 was 3(9.0%) of patients and age ranges 41-60 was found in 7(21.0%) as shown in Figure 1 and 2.

Frequency and percentage of prolong duration of postoperative treatment in Group A with age range of 20-40 showed a more than a week duration of treatment was found in 0(0.0%). In patient age range of 41-60 was in 0(0.0%). In Group B with age ranges 20-40 was found in 27(80.0%) and age ranges 41-60 was found in 34(100%) patients as shown in Figure 1 and 2.

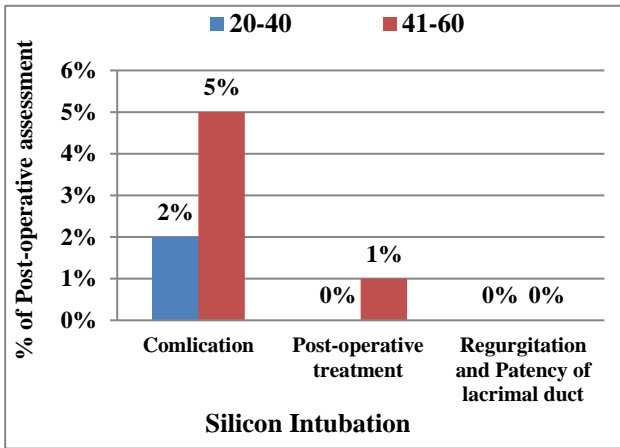


Figure 1: Percentage of post-operative assessment of variables in silicon intubation with different age ranges.

Frequency and percentage of regurgitation and lacrimal duct patency in Group A with age ranges of 20-40 was found in 0(0.0%) and patients with age ranges of 41-60 was found in 0(0.0%) patients. In Group B with age ranges 20-40 was found in 8(24.0%) and age ranges 41-60 was found in 12(35.0%) patients as shown in Figure 1 and 2.

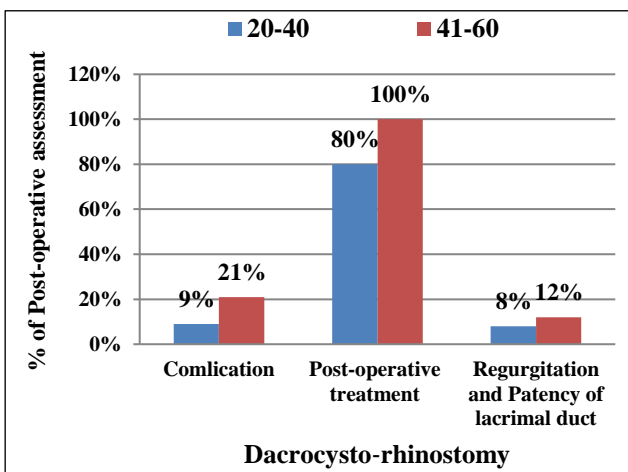


Figure 2: Percentage of post-operative assessment of variables in dacryocysto-rhinostomy with different age ranges.

DISCUSSION

Study was designed to evaluate the success rate of silicon tube intubation and DCR in adults and old age group. In

study we hypothesized that there is a difference found in success rate in relation to age. Previous studies had showed no evidence regarding age dependent success rate of the procedure. According to our experience the success of procedure is negatively correlated with age of patient. In accordance with the results of study documented that there is negative correlation between age and success rate of silicon tube intubation in lacrimal duct stenosis.⁶

In accordance to another study results showed total 121 patients of both genders were operated with single-wide and double- tube intubation in distal or common canalicular obstruction the age range were included in there study was 16-86 with mean age of 57.0±11.9. Success rate of two different silicon intubation showed significant success rate of procedure in adults and old age without complication.⁹

One of the study results revealed that application of silicon tube intubation showed higher rate of success in advance age group with mean age of 59.8±7.18 similar in present study.¹ Success rate was observed in given study in both group comprises of silicon tube intubation and dacryocystography with pre-operative syringing test were applied in advance age group, the mean age in sub groups were 62.3±10.9 and 58.6±10.3, that showed similar to our study results success rate of both procedure in adults and old age with minimal rate of complication and prolong follow up.¹² Similar to the present study the evidence of that study describe the success rate of silicon tube intubation in advance age group with free of symptoms and complications.¹³

Another randomized trial was conducted with both surgical procedures in primary acquired nasolacrimal duct obstruction, with age ranges of (39-92 years) and mean age was 64±13.7 and no significant difference was found among both groups.¹⁴ Results of past study showed the silicon tube intubation and dacryocystography both are safer surgical procedures in advance age groups in treatment of distal and canalicular obstruction cases with slight prolong follow-up and higher success rate with age of 52±13.6.¹⁵

The frequency of acquired nasolacrimal duct obstruction chances increases with age and dacryocystography is one of the successive surgical procedure in these cases with low percentage of complication with higher rate of success in age group of >80 years similar in our study the age negatively correlates with the procedures.¹⁶

CONCLUSION

This study results revealed that Nasolacrimal duct obstruction can be treated in advance age. The more appropriate surgical option is silicon intubation technique non-invasive, higher success rate without post-operative complication and prolongs treatment and reoccurrence chances as compared to other.

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