Original Article

Silicon Intubation VS Dacryocystorhinostomy in Treating Nasolacrimal Duct Blockage

Analyzing the Reduction of Symptoms in Dacryocystorhinostomy Patients With and Without Silicon Intubation A Study Using Randomized Controlled Trials

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ABSTRACT

Objective: To assess the efficacy of silicon intubation vs dacryocystorhinostomy in treating nasolacrimal duct blockage

Study Design: A Randomized Controlled Trial Study

Place and Duration of Study: This study was conducted at the Department of Clinical Ophthalmology, Khyber Girls's medical College, Hayatabad Medical Complex (HMC), Peshawar from 09th October 2022 to 9th April 2023.

Methods: 446 individuals with nasolacrimal duct obstruction (NLDO) were included in the research. Every patient was divided into two groups. Dacryocystorhinostomy (DCR) with silicon intubation was performed on Group A, whereas DCR without intubation was performed on Group B.

Results: The sample as a whole was 35.1 + 9.2 years old on average. Group A's mean age was 34.9 + 9.3 years, whereas Group B's mean age was 35.2 + 9.1 years (p 0.730). Males made up 61.9% of group A and 56.5% of group B, respectively (p 0.248). In group A, the mean duration of symptoms was 11 + 3.2 days, whereas in group B, it was 10.4 + 2.9 days (p 0.082). Upon follow-up, group A's effectiveness (measured by the total remission of symptoms) was 79.4%, whereas group B's was 69.5% (p 0.017).

Conclusion: When compared to DCR without intubation, silicon intubation greatly increases the effectiveness of DCR in individuals with NLDO.

Key Words: Nasolacrimal duct obstruction, dacryocystorhinostomy, intubation, silicon, and efficacy.

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INTRODUCTION

Total resistance to lacrimal irrigation with 100% regurgitation from the same or opposite punctum or a lacrimal sac mucocele without later reasons was characterized as primary acquired nasolacrimal duct obstruction (PANDO)[1]. There have been many surgical techniques published since Cadweli's proposal of endonasal dacryocystorhinostomy (DCR) in 1893, including MMED and laser endoscopic DCR[2]. Regardless of surgical approach, common reasons for DCR failure include synechial adhesion with middle turbinate and/or nasal septum and expanding cicatricial closure for secondary healing with/without granuloma development[3]. There were several operational aides for endonasal endoscopic mechanical DCR. Examples of medical interventions included canalicular stenting, intraoperative or postoperative mitomycin C, and absorbable or non-absorbable materials packed with or without medication, such as topical steroids. Ophthalmologists began to favor DCR with silicone intubation in the 1970s. They recommended it because ostium7's opening preservation improved surgical patency. Previous investigations have connected silicone stent failure to granulomatous inflammation Recent research discusses DCR surgery with 4 silicone intubation[4]. The most popular technique for preventing rhinostomy closure is the use of silicone stents. By preserving fistula patency and postponing fibrous closure after healing, silicone intubation may enhance the results of endoscopic DCR[5]. Silicone stenting during endoscopic DCR is still up for discussion, however. According to some studies, the silicone stent may induce tissue granulation, which raises the possibility of adhesions, postoperative infections, punctal lacerations, and surgical failure[6]. There were conflicting findings from two meta-analyses on silicone intubation during endoscopic DCR5. Research has

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contrasted endoscopic DCR using silicone intubation with not using it[7-12]. A previous research found DCR with silicon intubation efficient in 93.3% and failed in 6.7%. In another study, 90.3% of endoscopic endonasal DCR treatments were effective[9]. Silicone intubation increased success to 93.7% from 86.7% without it. The present study compares DCR success rates in our community's NDO patients with and without silicon intubation. We were prompted to perform this study after experiencing patient attrition with NDO and DCR failures, whether intubated or not[9]. The literature is vast, however, several studies were undertaken with small sample numbers and had inconsistent and equivocal findings. If silicon intubation is equally or more successful than not using it, we will discuss the study's results and urge local ophthalmologists to further research and regular use of it during DCR for NDO. This research will show local DCR success rates with and without intubation for NDO[10].

METHODS

Hospital ethics and scientific committee authorized the study. The OPD department included all NDO patients (per operational criteria) in the study. Every patient supplied written informed permission after being informed of the research's goals and advantages. All patients had medical histories and ophthalmologic examinations. Block randomization divided patients into two groups. DCR patients in Group A received canalicular silicone stenting or intubation. Because Group B patients had DCR without silicon intubation, the silicone stent was inserted by both puncta and knotted in the nasal cavity to relieve canthal strain. One skilled CPSP fellow ophthalmologist performed all surgeries. After four weeks, all patients were evaluated for symptom relief and saline injection-confirmed duct patency. 58 Premade proformas documented all the aforementioned. Research bias and confounders were eliminated using a stringent exclusion procedure. The following are inclusion criteria: All 18–50-year-olds with main acquired nasolacrimal duct blockage, either gender. Congenital dacryocystitis and presacral occlusion such as canalicular blockage and punctual stenosis are excluded. • Atrophic rhinitis, chronic granulomatous disorders, and nasal tumors may affect surgery outcomes. • Previous lacrimal surgery failures. Epiphora after radiation/trauma. Confounders like this may affect research outcomes.

RESULTS

The study comprised 446 NLDO patients. Split all patients in two. Group A had silicon-intubated DCR, but Group B did not. Each group had 223 patients. The age distribution is in Table 1. The sample averaged 35.1 + 9.2 years. Group A averaged 34.9 + 9.3 years, whereas Group B averaged 35.2 + 9.1 years (p 0.730). Gender distribution is in Table 2. Group A had more men than B, but B had more women. The mean symptom duration was 11 + 3.2 days in group A and 10.4 + 2.9 days in group B (p 0.082). See Table 3. Table 4 shows follow-up efficacy (symptom resolution). Group A had 79.4% DCR symptom remission following intubation, whereas group B had 69.5% (p 0.017).

Table No. 1: Comparison Of Age Between Both Groups (N=223 Each)

Age	DCR with silicon intubation No %		DCR without silicon intubation No %	
20-30 years	76	34.1%	74	33.2%
30-40 years	88	39.1%	86	39.0%
40-50 years	59	26.1%	62	27.8%
Total	223		223	

NO= number, % percentage, p value= 0.948

Table No. 2: Comparison Of Gender Between Both Groups (N=223 Each)

Gender	DCR with silicon intubation No %		DCR without silicon intubation No %	
Male	138	61.9%	126	56.5%
Female	85	38.1%	97	43.5%
Total	223	100%	223	100%

NO= number, % percentage, p value=0.248

Table No. 3: Comparison Of Duration Of Nldo Between Both Groups (N=223 Each)

Duration of NLDO	DCR with silicon intubation No %		DCR without silicon intubation No %	
5-10 days	77	34.5%	134	60.1%
10-15 days	146	65.5%	89	39,1%
Total	223	100%	223	100%

NO= number, % percentage, p value=0.01

Table No. 4: Comparison Of Efficacy Between Both Groups (N=223 Each)

Efficacy	DCR with silicon intubation No %		DCR without silicon intubation No %	
Yes	177	79.4%	155	69.5%
NO	46	20.6%	68	30.5%
Total	223	100%	223	100%

NO= number, % percentage, p value=0.017

DISCUSSION

Cryocystorhinostomy is the most frequent treatment for persistent dacryostenosis or nasolacrimal duct obstruction. Surgical DCR creates drainage between the nasal cavity and lacrimal sac[11]. LA-DCR, EN-DCR, and EX-DCR are the three DCR methods. In the 1970s, ophthalmologists preferred silicone intubated DCR[11]. They recommended its use and noticed that ostium opening preservation increased postoperative patency. Granulomatous inflammation increases silicone stent failure risk, according to prior studies[12]. Recent work

discusses silicone intubation during DCR surgery from different views. This study examined DCR success with and without stents and compared it to previous studies[13]. In a 2011 meta-analysis of DCR for nasolacrimal duct blockage with and without silicone tubes, DCR had equal success rates[14]. The meta-analysis found no benefit to silicone stent intubation for major DCR. Since 2010, more prospective comparison studies have shown that silicone intubation in primary DCR increased the success rate of DCR without intubation by 68 percent, even if these benefits were not statistically significant. In a large randomized controlled trial,[15] found that silicone intubation prevented the ostium from sealing, increasing DCR success. For effect size (population proportions 0.892 versus 0.943), sample size (111 and 105), and alpha (0.05, 2-tailed), the previous meta-analysis had four RCTs with a power of 0.274[16]. How silicone intubation would work during DCR surgery remained unknown. In the EX-DCR subgroup, DCR with intubation had a considerably greater success rate after surgery than DCR without intubation, according to this cumulative meta-analysis. Statistically significant change [RR, 1.06; 95%CI (1.02–1.11), p = 0.006][17]. The finding varied considerably from the previous meta-analysis. The preceding meta-analysis's low statistical power and few trials may explain the discrepancies. If the research has a negative outcome, consider its power[18]. If not, researchers risk type II errors and abandoning promising medicines. "Meta-analysis" combines the data of numerous "combinable." independent studies. Weak included studies enhance statistical power, decrease random error, and increase sample size[19]. Intranasal tissue granulation, adhesion, infection, hemorrhage, punctural or canalicular laceration, tube displacement or loss, and conjunctival irritation were common after surgery[20]. These concerns were linked to silicone tubes. The silicone tube may induce tissue granulation, a topic of controversy. Silicone intubation, an inorganic foreign material, may cause granulation and rhinostomy closure. Longari et al. found that stents decreased ostial size more. Turbinoseptal synaechia[21], peristomal granuloma, and scar tissue produced most of this. The success rate for silicon stenting was 79.4% in 223 cases. Due to the endoscope, EnDCR has replaced the external DCR. Understanding the lateral nasal wall's anatomy and changes is crucial[22]. The orbicularis oculi muscle's pumping action may explain EnDCR's strong functional results. Silicon tubing prevents stoma fibrous closure, keeping the fistula open after surgical recovery. After EnDCR[23], patients who retained silicon tubes outperformed those who extruded them. In a recent study, silicon stent recipients had a 79.4% success rate, whereas non-stent recipients had 69.5%. According to another study, the stent group had a greater Epiphora resolution rate, although it was not statistically significant. Kakkar et al.[19] and Unlu et al.[20] found that silicon tubes in children cause complications, but they found no significant differences between silicon stent DCR and standard DCR. Silicon stents greatly increase primary DCR failure, according to a retrospective study[24]. They advised against silicon stent placement unless there is a particular cerebral obstruction. Due to granulation tissue formation, silicon stents in DCR prevent osteotomy and common canalicular occlusion. The 91.3% effectiveness rate of this strategy matches Elmorsy et al. Study[23].

CONCLUSION

DCR with silicon intubation is significantly effective in patients with NLDO compared to DCR without intubation.

Recommendations: More randomized controlled studies with bigger sample sizes and multicenters are needed to establish the best local data to justify silicon intubation during DCR in NLDO patients.

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Author's Contribution:

Concept & Design of Study:	Nazullah
Drafting:	Nuzat, Samina Karim
Data Analysis:	Mohammad Israr, Romaisa
Revisiting Critically:	Nazullah, Nuzat
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