Original Article

EXAMINING THE DECREASE IN SYMPTOMS IN PATIENTS WITH DACRYOCYSTORHINOSTOMY BOTH WITH AND WITHOUT SILICON INTUBATION A RANDOMIZED CONTROLLED TRIAL

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ABSTRACT

Objective: *To determine if dacryocystorhinostomy or silicon intubation is more effective in treating nasolacrimal duct obstruction*

Study Design: *A Randomized Controlled Trial Study*

Place and duration of study: This research was conducted over a six-month period, from October 9, 2021, to April 9, 2022, at the Department of Clinical Ophthalmology, Khyber Girls' Medical College, Hayatabad Medical Complex (HMC), Peshawar.

Materials and Methods: *The study comprised 446 patients with nasolacrimal duct blockage (NLDO). Each patient was split up into two cohorts. Group A had cryocystorhinostomy (DCR) with silicon intubation, whereas Group B underwent DCR without intubation.*

Results: *The average age of the sample was 35.1 + 9.2 years. The mean age of Group B was 35.2 + 9.1 years, whereas the mean age of Group A was 34.9 + 9.3 years (p 0.730). Group A consisted of 61.9% males and group B had 56.5% males (p 0.248). The average number of days that symptoms persisted was 11 + 3.2 days in group A and 10.4 + 2.9 days in group B (p 0.082). As determined by the overall remission of symptoms, group A's efficacy was 79.4% at follow-up, whereas group B's was 69.5% (p 0.017).*

Conclusion: *For those with NLDO, silicon intubation significantly boosts the efficacy of DCR when compared to DCR without intubation.*

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

INTRODUCTION

Primary acquired nasolacrimal duct obstruction (PANDO) was defined as complete resistance to lacrimal irrigation with 100% regurgitation from the same or opposite punctum or a lacrimal sac mucocele without subsequent causes[1]. Since Cadweli's endonasal dacryocystorhinostomy (DCR) suggestion in 1893, other surgical procedures have been published, such as MMED and laser endoscopic DCR[2]. Regardless of the surgical technique, widening cicatricial closure for secondary healing with or without granuloma formation and synechial adhesion with middle turbinate and/or nasal septum are major causes of DCR failure[3]. A number of operational aids were available for endonasal endoscopic mechanical DCR. Medical treatments included the use of canalicular stenting, absorbable or non-absorbable materials packed with or without medicine, such as topical steroids, and intraoperative or postoperative mitomycin C. In the 1970s, ophthalmologists started to prefer DCR combined with silicone intubation[4]. They suggested it since the preservation of ostium 7's aperture enhanced surgical patency. Previous studies have linked granulomatous

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inflammation to silicone stent failure. Current literature addresses DCR surgery with four silicone intubations. Silicone stents are the most often used method of avoiding rhinostomy closure. Silicone intubation may improve the outcome of endoscopic DCR[6] by maintaining fistula patency and delaying fibrous closure after healing. However, there is still debate over silicone stenting during endoscopic DCR. Some research indicates that the silicone stent may cause granulation of the tissue, increasing the risk of adhesions, surgical failure, postoperative infections, and punctal lacerations.[7]. Two meta-analyses of silicone intubation during endoscopic DCR[5] had contradictory results. Studies have compared the use of silicone intubation in endoscopic DCR with its non-use[8]. A prior study showed that 93.3% of DCR cases with silicon intubation were successful and 6.7% were not[14]. 90.3% of endoscopic endonasal DCR treatments were successful in a different study[9]. Success rates rose from 86.7% to 93.7% with silicone intubation.[15]. In this research, DCR success rates in NDO patients with and without silicon intubation are compared in our community. This investigation was motivated by patient attrition due to NDO and DCR failures, regardless of intubation status[10]. Although there is a lot of research, several of the studies were conducted with small sample sizes and produced contradictory or unclear results. We will explain the study's findings and encourage local ophthalmologists to do more research and routinely employ silicon intubation during DCR for NDO if it proves to be as beneficial as not using it. The results of this study will provide local DCR success rates for NDO[11] both with and without intubation.

MATERIALS AND METHODS

The hospital ethics and scientific committee approved the project. OPD included all NDO patients (per operational criteria) in the trial. After learning the research's benefits, all patients gave written informed consent. Medical histories and ophthalmologic exams were done on all individuals. Block randomization split patients in two. Group A DCR patients had canalicular silicone stenting or intubation. To reduce canthal strain, Group B patients with DCR without silicon intubation had the silicone stent implanted by both puncta and knotted in the nasal canal. One competent CPSP fellow ophthalmologist conducted all procedures. After four weeks, all patients were assessed for symptom alleviation and saline injection-confirmed duct patency. 58 premade proformas listed everything. A strict exclusion technique removed research bias and confounders. The following are inclusion criteria: Both genders of 18–50-year-olds with primary acquired nasolacrimal duct obstruction. Excludes congenital dacryocystitis, canalicular obstruction, and punctual stenosis. • Chronic granulomatous diseases, atrophic rhinitis, and nasal tumors may impact surgical results. Previous lacrimal surgery failures. Radiotherapy/trauma epiphora. Such confounders may alter study results.

RESULTS

The research included 446 NLDO patients. Bifurcate all patients. Group A had silicon-intubated DCR, but not B. Each group contained 223 patients. The age distribution is in Table 1. Sample averaged 35.1 + 9.2 years. Group A averaged 34.9 + 9.3 years, whereas Group B averaged 35.2 + 9.1 (p 0.730). The gender distribution is in Table 2. Group A had more males, B 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). Refer to Table 3. Following effectiveness (symptom resolution), Table 4 demonstrates. Group A had 79.4% DCR symptom remission after intubation, whereas group B had 69.5% (p 0.017).

DISCUSSION

The most common therapy for chronic dacryostenosis or nasolacrimal duct occlusion is cryocystorhinostomy. Surgical DCR drains the nasal cavity and lacrimal sac[12]. Three DCR approaches are LA-DCR, EN-DCR, and EX-DCR. In the 1970s, ophthalmologists chose silicone-intubated DCR[12]. They advised it and found that ostium opening preservation improved postoperative patency. Previous studies[13] shown that silicone stent failure increased with granulomatous inflammation. Recent research examines silicone intubation in DCR surgery from many angles. This research compared DCR success with and without stents to prior studies[14]. DCR for nasolacrimal duct obstruction with and without silicone tubes showed equivalent success rates15 in a 2011 meta-analysis[21]. Silicone stent intubation did not help significant DCR in the meta-analysis. More prospective comparative studies have demonstrated that silicone intubation in primary DCR enhanced DCR without intubation success by 68% after 2010, even if these improvements were not statistically significant. A comprehensive randomized controlled experiment [16] demonstrated that silicone intubation inhibited ostium sealing, improving DCR success. The previous me-

Table 1: Comparison Of Age Between Both Groups (N=223 Each)

Age	DCR with silicon intubation		DCR without silicon intubation	
	NO	%	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 2: Comparison Of Gender Between Both Groups (N=223 Each)

Gender	DCR with silicon intubation		DCR without silicon intubation	
	NO	%	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 3: Comparison Of Duration Of Nldo Between Both Groups (N=223 Each)

Duration of NLDO	DCR with silicon intubation		DCR without silicon intubation	
	NO	%	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 4: Comparison Of Efficacy Between Both Groups (N=223 Each)

Efficacy	DCR with silicon intubation		DCR without silicon intubation	
	NO	%	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

ta-analysis comprised four RCTs with 0.27417 power for effect size (0.892 vs 0.943), sample size (111 and 105), and alpha (0.05, 2-tailed). How silicone intubation would perform during DCR surgery was uncertain. This cumulative meta-analysis found that DCR with intubation had a much higher success rate following surgery in the EX-DCR grouping. Significant change [RR, 1.06; 95%CI (1.02–1.11), p = 0.006].[18]. The discovery differed greatly from the prior meta-analysis. The previous meta-analysis's limited statistical power and few trials may explain the discrepancy. Power[19] should be considered if the study is unfavorable. If not, researchers risk type II mistakes and discarding potential drugs. "Meta-analysis" aggregates scores of "combinable." independent research. Included weak studies boost statistical power, reduce random error, and increase sample size[20]. Following surgery, intranasal tissue granulation, adhesion, infection, bleeding, punctural or canalicular laceration, tube displacement or loss, and conjunctival irritation were common[21] These issues included silicone tubing. The silicone tube may cause tissue granulation, a debate. Inorganic silicone intubation may produce granulation and rhinostomy closure. Longari et al. discovered stents reduced ostial size more. Scar tissue, peristomal granuloma, and turbinoseptal synaechia[22] generated much of this. Silicon

stenting had 79.4% success in 223 instances. Due to the endoscope, EnDCR replaced external DCR. Knowing the lateral nasal wall's structure and alterations is crucial[23]. The orbicularis oculi muscle's pumping may explain EnDCR's efficacy. Silicon tubing keeps the fistula open following surgery by preventing fibrous closure. Retained silicon tubes outperformed extruded ones after EnDCR24. A recent research found that silicon stent patients had a 79.4% success rate and non-stent recipients 69.5%. Although not statistically significant, Acharya, Harvinder, and Feng et al.[25] found that the stent group resolved Epiphora faster. Kakkar and Unlu discovered that silicon tubes in children create complications[26], but silicon stent DCR and normal DCR were similar. Retrospective studies show silicon stents dramatically enhance primary DCR failure. They recommended avoiding silicon stent implantation unless there is a cerebral blockage. DCR silicon stents prevent osteotomy and common canalicular blockage by forming granulation tissue. This technique matches Elmorsy et al. Study[27]'s 91.3% efficacy.

CONCLUSION

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

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