Original Article / Özgün Araştırma

Endoscopic Dacryosistorhinostomy with or without Stent

Stentli ve Stentsiz Endoskopik Dakriyosistorinostomi

Yeşim Başal[1], Ayşe İpek Akyüz Ünsal[2], Ceren Günel[1], Aylin Eryılmaz[1], Sema Başak[1]

[1]Aydın Adnan Menderes University Faculty of Medicine, Department of Otolaryngology, Aydın, Turkey
[2]Aydın Adnan Menderes University Faculty of Medicine, Department of Ophthalmology, Aydın, Turkey

Abstract

Objective: The purpose of this study is to investigate the effect of the use of silicone stent in endoscopic dacryocystorhinostomy operation on the surgical success and to compare the results of the patients who had silicone stents placed or not.

Materials and Methods: Forty-six eyes of 38 patients who had undergone endoscopic dacryocystorhinostomy surgery between May 2013 and January 2015 were involved in the study. The groups with or without stent were compared with respect to the surgical outcomes.

Results: Fifteen of the patients were male and 23 were female. Twenty-two eyes of 19 patients were operated without stent and 24 eyes of 19 patients were operated with stent. The follow-up period was between 9-30 months. Epiphora was corrected 91.7% in the group with stent and 86.4% in the group without stent. The intergroup difference in terms of the correction of epiphora was not found statistically significant (p=0.659).

Conclusion: The success rates are similar in the endoscopic dacryocystorhinostomy operations performed with or without stent placement. Endoscopic dacryocystorhinostomy operation with or without stent placement is successful and efficient. The use of silicone stent in the endoscopic dacryocystorhinostomy operations does not affect success.

Keywords
Endoscopy, dacryocystorhinostomy, nasolacrimal duct, stent

Anahtar Kelimeler
Endoskopi, dakriyosistorinostomi, nazolakrimal kanal, stent

Received/Geliş Tarihi : 22.01.2018
Accepted/Kabul Tarihi : 28.08.2018

doi:10.4274/meandros.galenos.2018.19480

Address for Correspondence/Yazışma Adresi:
Yeşim Başal MD,
Aydın Adnan Menderes University Faculty of Medicine, Department of Otolaryngology, Aydın, Turkey
Phone : +90 532 400 10 11
E-mail : yesimdurgun@gmail.com

ORCID ID: orcid.org/0000-0001-9002-0619

Öz

Amaç: Bu çalışmanın amacı endoskopik dakriyosistorinostomi ameliyatı sırasında silikon stent kullanımının cerrahi başarıya etkisini araştırmak, stentli ve stentsiz grupların sonuçlarını karşılaştırmaktır.

Gereç ve Yöntemler: Mayıs 2013 ve Ocak 2015 tarihleri arasında endoskopik dakriyosistorinostomi ameliyatı geçiren 38 hastanın 46 gözü çalışmaya dahil edildi. Silikon stent kullanılanlar stentli grubu ve kullanılmayan hastalar stentsiz grubu oluşturdu. Her iki grubun verileri karşılaştırıldı.

Bulgular: Çalışmaya katılan 15 erkek, 23 kadın hasta vardı. On dokuz hastanın 22 gözü stentsiz olarak ve 19 hastanın 24 gözü stent kullanılarak opere edildi. Takip süresi 9-30 ay arasındaydı. Epifora stentli grupta %91,7 oranında ve stentsiz grupta %86,4 oranında düzeldi. Gruplar arasındaki bu farklılık istatistiksel olarak anlamlı değildi (p=0,659).

Sonuç: Silikon stent kullanılan ve kullanılmayan endoskopik dakriyosistorinostomi ameliyatlarında başarı oranları benzerdir. Endoskopik dakriyosistorinostomi ameliyatı başarılı ve etkindir. Silikon stent kullanımı cerrahi başarıyı etkilememektedir.

Introduction

Endoscopic dacryocystorhinostomy (EDCR) is a minimally invasive surgery used in the treatment of nasolacrimal duct obstruction and chronic dacryocystitis. In addition to being minimally invasive, it has advantages such that its short operation duration, little bleeding, not leaving an external scar, not causing injury of medial chantal anatomy or lacrimal sac pump dysfunction (1,2).

After the bone window has been opened and the medial wall of the nasolacrimal sac has been incised in the EDCR operation, various stents (Ss) or intubation tubes can be used in order to prevent closing of the rhinostomy formed (3,4). There are studies demonstrating that the rhinostomy formed in the EDCR operation works successfully also when S is not placed (5). The purpose of this study is to investigate the effect of the use of silicone S in EDCR operation on the surgical success and to compare the results of the patients who had silicone Ss placed or not.

Materials and Methods

The files of 38 patients (46 eyes) who admitted to otorhinolaryngology clinic of Aydın Adnan Menderes University with epiphora between May 2013 and January 2015, diagnosed with chronic dacryocystitis and nasolacrimal duct obstruction and undergone EDCR operation were reviewed retrospectively. All of the cases had non inflamed lacrimal sac obstruction. Prior to surgery, all patients were performed lacrimal system lavage by an ophthalmologist and the diagnosis was confirmed by dacryocystography.

All patients were operated with general anesthesia. The stages of the surgery include decongestion of the nasal cavity (with 1/100000 lidocaine with adrenaline soaked swabs), injection of 1/100000 lidocaine with adrenaline into the lateral nasal wall, localization of the sac, mucosal incision, flap elevation, removal of bone window with chisel/hammer or drill, dilatation of punctum and bowman cannulation, incision of the sac and excision of the medial wall of the sac. After this stage of the operation, some of the patients were inserted silicone S whereas some of them could not be inserted. In the group which has not been inserted silicone S, after excision of the medial wall of the sac, a small piece of spongostan was placed between the sac and the nasal passage and spongostan pack was placed into the nasal cavities of all patients at the end of the procedure.

In the postoperative period, 1 week of peroral systemic antibiotic, nasal irrigation with ringer lactate, two weeks of eye drops with antibiotic and steroid were applied. In the postoperative first week, lacrimal lavage was performed to clean up the debris and post-surgery 1st week, 1st, 2nd and 6th month follow-ups were carried out regularly. The follow-up period was between 9-30 months. The mean S removal time was 2.5±1.0 months.

The patients for whom post-surgery silicone S was used comprised the group with S and the rest comprised the group without stent (WS). The operation was considered successful if complete remission of the symptoms was achieved in the post-operative period, the patency was shown by lacrimal lavage and lacrimal drainage from rhinostomy was observed in the endoscopic examination. The operation was considered unsuccessful if partial but not complete remission of the complaints was achieved and the patency could not be shown by lacrimal lavage or lacrimal drainage from rhinostomy was not observed in the endoscopic examination. S and WS groups were compared with respect to the surgical outcomes. The data were analyzed by Fisher's exact test and t-test. $P<0.05$ was considered statistically significant. This study was conducted in accordance with the principles of Helsinki Declaration 2013. The study were approved by the Adnan Menderes University of Local Ethics Committee (protocol number: 13.2.2015, 2015/538).

Results

Fifteen of the cases were male and 23 were female. 46 eyes of 38 cases were involved in the study. The mean age was 61.3±15.1 in the S group and 56±18.7 in the WS group (between 13-83 years old.). There was no statistically significant difference between the groups in terms of age or gender (p=0.346, p=0.507). 30 of the cases were operated unilaterally and 8 were operated bilaterally. The obstruction was 60.9% in the left eye (n=28) and 39.1% in the right eye (n=18). Six of the patients were revision cases who had previously undergone EDCR operation.

All cases in the WS group were operated using drill. 4 of the cases in the S group were operated using drill and 15 of them using chisel/hammer. 58.7% of all

operations were performed with drill and 41.3% with chisel/hammer. Twenty-four eyes of 19 patients in the S group (n=24) were operated with S and 22 eyes of 19 patients in the WS group (n=22) were operated WS. Epiphora was evaluated with complete remission of symptoms, lacrimal lavage and endoscopic examination of rhinostomy. Epiphora was corrected 91.7% in the S group (n=22) and 86.4% in the WS group (n=19). The intergroup difference in terms of the correction of epiphora was not found statistically significant (p=0.659). Results and some features of groups are shown in Table 1.

Discussion

There are a large number of studies in the literature about EDCR operation. The effect of the use of silicone S on biofilm formation, microbial growth, flora changes and surgical success are among the research subjects (6-9). In this study we aimed to examine the effect of silicone intubation on the surgical success within our patient group.

There are some disadvantages of the use of silicone S. There are studies reporting *Pseudomanas aeruginosa* colonization on the silicone Ss and the formation of biofilm layer on the S even if the S culture is negative (8,10). In addition to this microbiological change of Ss, it is known that resistant microorganisms colonize in the nasal flora after EDCR operations in which silicone S was used (9). Granulation tissue formation around silicone Ss has been reported as a factor leading to unsuccess (11). The use of silicone S is likely to increase the operational cost. In EDCR, there may be difficulties associated with the use of silicone tube (12). Therefore, especially at the beginning of the surgery experience, cooperation with an ophtalmologist for the placement of the S may be necessary. These may be regarded as some disadvantageous aspects of silicone S.

During surgery, drill, chisel/hammer, rounger, forceps, curette or laser can be used to open the bone window (13,14). In this study, the bone window was opened by drill in all cases of the WS group and chisel/hammer was used in most of the cases of the S group. We think that the use of drill is easier than the use of chisel/hammer and the bone window can be widened as much as needed by using drill. The only disadvantage of using drill is the need for cold water irrigation in order to prevent thermal damage to the bone tissue from heat. We haven't encountered any literature knowledge about the effect of drill related thermal damage to EDCR. Yet we do not think it has any negative effect as a clinical observation.

The factors affecting the success of EDRC operation are the correct localization of the sac, opening the rinostomy at the correct place, forming a wide bone window and sufficient excision of the medial wall of the sac (15). Silicone S is used to maintain new rhinostomy opening formed by EDCR operation (9). There are studies where mitomycin C is used to prevent closure of the rhinostomy opening (16). On the contrary, some authors argue that silicone S is not required for surgical success. Pittore et al. (17) have reported their success rate of endoscopic DCR operations they have performed without using silicone S as 90%. Yeon and Shim (18), in their study comparing the EDCR operations performed with or without silicone S, have reported that there was no statistically significant difference between the two groups. There are authors reporting higher success rates in non-stented EDCR operations than the stented ones (19). In our study

Table 1. Results and some features of groups

	Stent group (n=19)	Without stent group (n=19)
Mean age	61.3±15.1	56±18.7
Female/male	10/9	13/6
Obstruction level	Lacrimal sac	Lacrimal sac
Inflame lacrimal sac	Absent	Absent
Number of revision cases	3	3
Surgical procedure	Chisel/hammer and drill	Drill
Success Rate	91.7%	86.4%
Number of failure case	2	3
Follow-up	16-30 month	9-17 month

too, no statistically significant intergroup difference was found with respect to the correction of epiphora. Our success rates are 91.7% in the S group and 86.4% in the WS group. Therefore, we suggest that the use of silicone S in the EDCR operations does not affect success.

As a result, EDCR operation with or WS placement is successful and efficient. The success rates are similar in the EDCR operations performed with or WS placement. The use of silicone S in the EDCR operations does not affect success. In addition to the fact that the use of silicone S does not affect success, considering the granulation tissue formation around it, that it increases cost, the biofilm layer formation and the change of flora it causes, we recommend not to use S in EDCR operations.

Acknowledgements

We thank İmran Kurt MD. for expert help with data analysis.

Ethics

Ethics Committee Approval: The study were approved by the Aydın Adnan Menderes University of Local Ethics Committee (protocol number: 13.2.2015, 2015/538)

Informed Consent: Consent form was filled out by all participants.

Peer-review: Externally peer-reviewed.

Authorship Contributions

Surgical and Medical Practices: Y.B., A.İ.A.Ü., C.G., Concept: Y.B., A.İ.A.Ü., S.B., C.G., A.E., Design: Y.B., A.İ.A.Ü., S.B., C.G., A.E., Data Collection or Processing: Y.B., A.İ.A.Ü., C.G., A.E., Analysis or Interpretation: Y.B., A.İ.A.Ü., S.B., C.G., Literature Search: Y.B., A.İ.A.Ü., C.G., A.E., Writing: Y.B., A.İ.A.Ü., S.B., C.G., A.E.

Conflict of interest statement: The authors have declared that no conflict of interest exists.

Financial Disclosure: The authors declared that this study received no financial support.

References

1. Weidenbecher M, Hosemann W, Buhr W. Endoscopic endonasal dacryocystorhinostomy: results in 56 patients. Ann Otol Rhinol laryngol 1994; 103: 363-7.
2. Hartakinen J, Grenman R, Puukka P, Seppa H. Prospectiive randomized comparison of external dacryocystorhinostomy and endonasal laser dacryocystorhinostomy. Ophthalmology 1998; 105: 1106-13.
3. Okuyucu S, Gorur H, Oksuz H, Akoglu E. Endoscopic dacryocystorhinostomy with silicone, polypropylene, and T-tube stents; randomized controlled trial of efficacy and safety. Am J Rhinol Allergy 2015; 29: 63-8.
4. Shah H, Sharma S, Suri N, Ralte A, Sarkar C, Gupta V et al. Comparison of surgical outcome in endoscopic dacryocystorhinostomy with and without silicon stent placement. Natl J Med Res 2013; 73: 34-7.
5. Abdelshafy IA, Wagdy FM. Trans nasal powered endoscopic dacryocystorhinostomy with and without stenting. J Am Sci 2013; 9: 448-51.
6. Feng YF, Cai JQ, Zhang JY, Han XH. A meta-analysis of primary dacryocystorhinostomy with and without silicone intubation. Can J Ophthalmol 2011; 46: 521-7.
7. Cirkovic I, Knezevic M, Bozic DD, Rasic D, Larsen AR, Dukic S. Methicillin-resistant Staphylococcus aureus biofilm formation on dacryocystorhinostomy silicone tubes depends on the genetic lineage. Graefes Arch Clin Exp Ophthalmol 2015; 253: 77-82.
8. Kim SE, Lee SJ, Lee SY, Yoon JS. Clinical significance of microbial growth on the surfaces of silicone tubes removed from dacryocystorhinostomy patients. Am J Ophthalmol 2012; 153: 253-7.
9. Başal Y, Güleç G, Ertuğrul B, Eryilmaz A, Günel C, Başak S. Changes in nasal flora one year after endoscopic dacryocystorhinostomy. B-ENT 2015; 11: 129-34.
10. Parsa K, Schaudinn C, Gorur A, Sedghizadeh PP, Johnson T, Tse DT, et al. Demonstration of bacterial biofilms in culture-negative silicone stent and jones tube. Ophthal Plast Reconstr Surg 2010; 26: 426-30.
11. Onerci M, Orhan M, Ogretmenoğlu O, Irkeç M. Long-term results and reasons for failure of intranasal endoscopic dacryocystorhinostomy. Acta Otolaryngol 2000; 120: 319-22.
12. Aydın S, Paksoy M, Altın G, Eken M, Şanlı A. Our Endoscopıc Dacryocystorhınostomy Results. J Kartal TR 2008; 19: 80-4.
13. Yuen KSC, Lam LYM, Tse MWY, Chan DD, Wong BW, Chan WM. Modified endoscopic dacryocystorhinostomy with posterior lacrimal flap for nasolacrimal duct obstruction. Hong Kong Med J 2004; 10: 394-400.
14. Ajallolloueyan M, Fartookzadeh M, Parhizgar H. Use of laser for dacryocystorhinostomy. Arch Otolaryng Head Neck Surg 2007; 133: 340-3.
15. Başal Y, Ünsal AIA, Günel C, Eryılmaz A, Başak S. Our results of endoscopic dacryocystorhinostomy and silicone tube intubation: results of a case series. Turkish J Rhinology 2014; 3: 51-5.
16. Cheng SM, Feng YF, Xu L, Li Y, Huang JH. Efficacy of mitomycin C in endoscopic dacryocystorhinostomy: a systematic review and meta-analysis. PLoS One 2013; 8: 1-10.
17. Pittore B, Tan N, Salis G, Brennan PA, Puxeddu R. Endoscopic transnasal dacryocystorhinostomy without stenting: results in 64 consecutive procedures. ACTA otorhinolaryngologica İtalica 2010; 30: 294-8.
18. Yeon JY, Shım WS. Endoscopic dacryocystorhinostomy without silicone stent. Acta Oto-Laryngologica 2012; 132: 77-81.
19. Smirnov G, Tuomilehto H, Terasvirta M, Teräsvirta M, Nuutinen J, Seppä J. Silicone tubing is not necessary after primary endoscopic dacryocystorhinostomy: Aprospective randomized study. Am J Rhinol 2008; 22: 214-7.