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Özgün Çalışma / Original Article

External Dacrıocystorınostomy Wıth Sılıcone Tube Intubatıon; Long Term Results

Silikon Tüp Entübasyonlu Eksternal Dakriyosistorinostomi; Uzun Dönem Sonuçları

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ABSTRACT

AIM: To present the long-term results of bicanalicular silicone tube intubation combined with external dacryocystorhinostomy (EDRS) in-patient with nasolacrimal duct obstruction (NLDO)

MATERIAL AND METHOD: Long-term results of 169 eyes of 169 patients who underwent external dacryocystorhinostomy between January 2010 and December 2020 in our clinic were evaluated, retrospectively. On the postoperative 1st day, 10th day, 1st month, 3rd month, 6th month, 9th month, 12th month and last visits, the patients were evaluated. Especially on the postoperative 1st day for signs of infection, the position, tension, and placement of the silicone tube, and the presence of epiphora. Silicone tubes of the patients were removed 6 months after surgery. Surgical success; The disappearance of the patients' symptoms was evaluated as the lacrimal drainage open.

RESULTS: One hundred two of our cases were female and 67 were male. The mean age-standard error was 55,48±1,36. Our average follow-up-standard error was 47,83±2,27 months. Surgical failure occurred in two of our patients. These cases were those who had severe bleeding occurred during surgery and flaps were formed with difficulty. In these cases, revision surgeries were performed with an internal approach and surgical success were achieved in both of them. In our patients, who underwent bicanalicular silicone tube intubation surgery combined with external dacryocystorhinostomy, surgical success rate was 98,76% in the first operation and 100% in the second operation.

CONCLUSION: Considering the long-term results of bicanalicular silicon tube intubation combined with dacryocystorhinostomy operations, it is the most effective surgical method with the highest success rate in nasolacrimal canal obstruction.

Keywords: external dacryocystorhinostomy, epiphora, nasolacrimal obstruction, silicone tube intubation.

ÖZET

AMAÇ: Nazolakrimal kanal tıkanıklığı olan hastalarda eksternal dakriyosistorinostomi (EDRS) ile kombine bikanaliküler silikon tüp entübasyonunun uzun dönem sonuçlarını sunmak.

GEREÇ VE YÖNTEM: Ocak 2010-Aralık 2020 tarihleri arasında kliniğimizde eksternal dakriyosistorinostomi ve bikanaliküler silikon tüp entübasyonu uygulanan 169 hastanın 169 gözünün uzun dönem sonuçları retrospektif olarak değerlendirildi. Postoperatif 1. gün, 10. gün, 1. ay, 3. ay, 6. ay, 9. ay, 12. ay ve son ziyaretlerinde hastalar değerlendirildi. Özellikle ameliyat sonrası 1. günde enfeksiyon belirtileri, silikon tüpün pozisyonu, gerginliği ve yerleşimi ve epifora varlığı değerlendirildi. Hastaların silikon tüpleri ameliyattan 6 ay sonra çıkarıldı. Cerrahi başarı; hastaların semptomlarının kaybolması lakrimal drenajın açık olması olarak değerlendirildi.

BULGULAR: Olgularımızın 102'si kadın, 67'si erkekti. Ortalama yaş, 55,48±1,36 idi. Ortalama takip 47,83±2,27 aydı. İki hastamızda cerrahi başarısızlık meydana geldi. Bu olgular ameliyat sırasında şiddetli kanama olan ve zorlukla flep oluşturulmuş olgulardır. Bu olgularda internal yaklaşımla revizyon ameliyatları yapıldı ve her ikisinde de cerrahi başarı sağlandı. Eksternal dakriyosistorinostomi ile kombine bikanaliküler silikon tüp entübasyon cerrahisi uygulanan hastalarımızda cerrahi başarı oranı ilk operasyonda %98,76, ikinci operasyonda %100 olarak bulundu.

SONUÇ: Eksternal dakriyosistorinostomi operasyonları ile kombine bikanaliküler silikon tüp entübasyonu; uzun dönem sonuçları göz önüne alındığında, nazolakrimal kanal tıkanıklığında başarı oranı en yüksek olan en etkili cerrahi yöntemdir.

Anahtar kelimeler: Eksternal dakriyosistorinostomi, epifora, nasolakrimal kanal tıkanıklığı, silikon tüp intubasyonu.

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INTRODUCTION

Nasolacrimal duct obstruction is clinically characterized by recurrent acute dacryocystitis attacks and epiphora and its etiology is not fully known.[1,2] However, the obstruction of the nasolacrimal duct is thought to be caused by fibrosis and stenosis in the duct ostium as a result of chronic inflammatory process.[3] Nasolacrimal duct obstruction may be secondary to granulomatous nasal mucosa diseases such as trauma, malignancy, Wegener's granulomatosis and sarcoidosis diseases.[2]

The treatment of epiphora due to nasolacrimal duct obstruction is surgery. While planning the surgery, the aim is; it the permanent opening of the pathway of the lacrimal sac to the nasal cavity. It was first described by Toti in 1904 for the treatment of epiphora due to nasolacrimal duct obstruction and modified by Dupuy-Dutemps and Boureguet in 1921.[4] External dacryocystorhinostomy surgery, which still accepted as the gold standard, is still valid. However, the method was further developed over the years and bicanalicular silicone tube intubation was included in the application in the 1980s.[5,6]

In our study, we aimed to evaluate the long-term results of our patients, who underwent external dacryocystorhinostomy combined with bicanalicular silicone intubation performed by the Dupuy-Dutemps-Boureguet method in our clinic.

MATERIAL AND METHOD

169 eyes of 169 patients (107 females and 62 males) who underwent bicanalicular silicone tube intubation combined with external dacryocystorhinostomy between January 2010 and December 2020 in our clinic were included in this study. The first eye side of the patients who underwent bilateral surgery was included in the study. Necessary permissions were obtained from the ethics committee of our hospital for our study (ethics committee application number E-21/737). Our study is a retrospective study and complies with the Helsinki declaration rules.

The records of the cases were evaluated, retrospectively. Before surgery, all patient underwent routine ophthalmologic examination and nasolacrimal lavage. While evaluating the nasolacrimal passage, topical (Alcaine, Alcon) anesthesia was applied to the conjunctival sac before lavage, and then the lavage cannula was placed in the lower punctum. Irrigation was performed with a 3-cc saline injected syringe. The nasolacrimal passage was considered to be closed in patients with regurgitation from the punctum and in patients who confirmed that there was no saline flow to the throat.

Patients with stenosis at the canaliculus level, patients with pump failure, patients with ocular surface disease such as dry eyes and keratitis, and patients with eyelid problems such as chronic blepharitis and meiboimitis were not included in the study. In addition, patients with a history of trauma, and inflammatory diseases such as sarcoidosis were excluded from the study. Ear, nose and throat examination were performed in all cases included in the study to evaluate the nasal passage and oropharynx. Cases with nasal passage problems that might affect the success of the operation were not included in the study. All of the patients included in the study were operated under general anesthesia by the same oculoplastic surgeon (F.Ö). As a surgical technique; Dupuy-Dutemps-Bourgeut technique and bicanalicular silicone tube intubation were performed for all cases.

Surgical Method

Under general anesthesia, a 20-mm long vertical skin incision was made at a distance of 10 mm from the internal canthus. The incision line was advanced into the subcutaneous tissue by blunt dissection. The medial canthal tendon was found and cut. Then the dissection was continued until reaching the bone tissue. After reaching the periosteum, the periosteum was elevated with the help of a periosteum elevator. Bone rondel was removed with the help of a dental tour. Upper and lower flaps were created from the lacrimal sac wall and nasal mucosa. The adhesions in the lacrimal sac were separated. The lower flaps were sutured together with three single 6/0 vicryl sutures. A bicanalicular silicone tube was passed through the lower and upper punctum, the silicone tips were tied together with the help of free silk, and removed from the nose with the help of coher. Then and the upper flaps were sutured together with three single 6/0 vicryl sutures. Medial canthal tendon ends were sutured together. The skin and subcutaneous tissue were sutured with 6/0 vicryl. A single dose of intravenous cefazolin antibiotic was administered before the surgery. Postoperative amoxicillin-clavulanic acid 1000 mg 2x1 (Augmentin, GlaxoSmithKline) and naproxen sodium tablet 2x1 (Apranax, Abdi İbrahim) used for one week. Netilmicin-dexamethasone combination drops (Netildex, Teka) were used for eight times during postoperative two weeks.

At the postoperative 1st day control, the cases were evaluated in term of signs of infection, position, tension, placement of bicanalicular silicone tube and presence of epiphora. After surgery, day 10, 1st month, 3rd month, 6th month, 9th month, 12th month and last visit were made. Bicanalicular silicone tubes were removed after six months' surgery.

RESULTS

It was accepted as a success that the patient's complaints of watering go away and the passage was open with irrigation.

While failure occurred in 2 of our cases after the first surgery. The passages of the other cases were followed open and no problem was observed during the follow-up period. In 1 of the cases who failed in the first surgery, lavage was found negative in the 1st month after the operation. In the other case lavage was found negative 1 month after the removal of the silicone tube. These two cases had heavy bleeding and difficulty in forming flaps during surgery. In these unsuccessful cases, revision surgery was performed with an endoscopic approach. In the postoperative follow-up, the passage was found open. At the end of our follow-up period of 47.83±2.27 months the passage patency was determined as 98.76% in the first surgery and 100% after the second surgery.

In our cases, a scar occurred at the site of the skin incision in one patient after the surgery. When this case is questioned, it was seen that there was a patient with this potential, who developed keloid as a result of injuries in other parts of his body.

DISCUSSION

The external dacryocystorhinostomy surgery was first described by Toti and further developed by Dupuy-Dutemps and Boureguet., which was modified later. It is still considered to be the most effective method today. Despite methods such as non-endoscopic endonasal DCR, endoscopic DCR, laser endoscopic endonasal DCR, balloon dacrioplasty, that success rate of external DCR is reported to be between 85-99 %.[8,9,10,11,12]

Failure of the external dacryocystorhinostomy surgery may include not choosing the correct localization of the bone window, not opening it in sufficient size, common canalicular obstruction, disruption of the connection of the nasal mucosa with the lacrimal sac development of granulation tissue in the anastomosed area. In addition to these reasons, external dacryocystorhinostomy may fail due to reasons such as progression of ethmoid cells to the surgical area and scar formation between anterior and posterior flap.[8]

The mucosal canal opened during the intubation of the silicone tube is important. The experience of the oculoplastic surgeon is important in this regard. Creating and channeling a mucosal flap is a difficult technique. The anatomical success of the mucosal canal after surgery is dependent on the minimal damage to the soft tissues in the surgical area, the appropriate size of osteotomy, proper dissection of the tissues and reaching the pouch lumen, proper suturing of the mucosa and pouch flaps, and personal factors in the healing process.[13,14]

In order to increase the success rate of external dacryocystorhinostomy surgery, bicanalicular silicone tube intubation is recommended in recurrent cases, common canalicular occlusion, and small lacrimal sac, atrophic and fibrotic sac due to chronic dacryocystitis, if flap loss occurs during surgery or if flap suturing cannot be performed.[6,7,8,15,16]

Bicanalicular silicone tube intubation enhances the success rate of DCR surgery.[5] There are opinions suggesting that tube use increases the complication rate in the postoperative period.[6] We know that silicone tube intubation increases surgical success. Due to, we applied silicone tube intubation in all of our cases. We think that silicone tube intubation contributes to our high success rates. However, in a meta-analysis study, it was concluded that bicanalicular silicone tube intubation did not have a positive contribution to surgical success regardless of the dacryocystorhinostomy surgical method.[11]

Antifibrotic agent Mitomycin-C is a drug with proven efficacy in glaucoma surgery. This drug is used for different purposes in ophthalmology area. It has been reported that mitomycin C increases the success rate in dacryocystorhinostomy surgeries by preventing fibrous proliferation and scar formation without causing any significant complications.[16] However, when dacryocystorhinostomy operations are performed with minimal damage to tissues in experienced hands, successful results can be obtained without using additional success-enhancing drugs such as mitomycin, as in our cases, and unnecessary drug use is avoided.

Another effective method that increases surgical success is the smooth end-to-end suturing of the anterior and posterior flaps. The suturing of the posterior flaps is very time-consuming and sometimes not possible due to insufficient mucosal surface. Various modifications have been created for these reasons. Deka et al. performed a study by suspending the anterior flap anastomosis on the orbicularis oculi muscle after the anterior and posterior flap anastomosis.[18] They achieved a success rate of 98.9 % after 13 months of follow-up of the cases.[18] The high surgical success achieved by Deka et al. It can also be attributed to the double flap technique, the hanging of the anterior flap over the orbicularis oculi muscle, or the combination of these two techniques. In a study by Kazancı et al., they followed up the patients who had single flap and double flap anastomosis for 18 months; both groups hung the upper flap over the orbicularis ocular muscle. They found surgical success 92,4% in the single flap group and 95.5% in the double flap group.[13]

In a study by Baldeschi et al., the only anterior flap was formed. After suturing the wide and mobile nasal mucosa and lacrimal sac flaps, suturing again to the orbicularis oculi muscle, a 17-month follow-up was performed and they stated that the surgical time was shortened and there was no recurrence.[4] Serin et al. compared a group in which posterior flaps were excised after anterior flap suturing was performed. The success rate of the group in which they applied the double flap technique was 93.75%, and the success rate of the group in which they applied single flap suturing followed by lower flap excision was 96.67%. There was no statistically significant difference between these rates. In their study, they stated that the surgical time was significantly shortened in surgery in which they excised the lower flaps.[19] In our cases, the flaps were sutured by creating upper and lower flaps. As a result of the average follow-up of our cases, our success rate was found to be 98.76% after the first surgery and 100% after the revision surgery.

It is stated that performing dacryocystorhinostomy surgeries endoscopically has advantages such as no scar formation due to no incision on the skin, early rehabilitation, short surgical time, and early recovery. In a study, the success rate in 498 cases was reported as 90.4% in the first surgery.[20] As can be seen in our study, the success rates are still below the external dacryocystorhinostomy surgeries of endoscopic dacryocystorhinostomies even inexperienced hands. Considering the other advantages, we think that the advantages such as operation time, early rehabilitation, and surgical time in experienced hands do not provide an advantage to external dacryocystorhinostomy. The most important disadvantage of external dacryocystorhinostomy surgeries is the scars that occur due to skin incision. In our cases, a significant scar formation occurred in only one case. We think that this occurs as a personal augmented response to wound healing. We think that it will not cause a serious scar and scar problem after the incision is made as small as possible by the anatomy.

It is a surgical method used in nasolacrimal duct obstructions in endoscopic laser applications, which have gained popularity in recent years but are gradually decreasing in popularity. In the study of Kütükde et al., transcanalicular multi diode laser dacryocystorhinostomy and external DCR surgery were compared. Success rates were found to be 68% and 86%, respectively.[21] Considering the long-term results, our study results confirm that classical dacryocystorhinostomy surgeries still have a clear advantage over alternative methods. In our cases, our success rate in the first operation with the classical method and bicanalicular tube intubation is 98.76%. Akcam et al. reported success rates of 86.6% and 100%, respectively,[22] in their study in which they compared trans canalicular multi-diode laser and mechanical endoscopic dacryocystorhinostomy surgeries in the long term. Although a high success rate has been reported compared to multi diode laser and endoscopic mechanical methods, the general belief still has not changed the idea that external dacryocystorhinostomy surgeries are the gold standard.

In a study conducted by Ghasemi et al. with 113 patients, they performed silicone tube intubation in external dacryocystorhinostomy surgery and found a success rate of 85%. In this study, 15% of the unsuccessful patients were re-evaluated by endoscopic examination, and in the examination; 70% deviation of the septum and 53% scar tissue were found.[23] In this study, the importance of preoperative Ear, Nose, and Throat examination was emphasized.[23] The fact that the cases included in the study were selected among the cases with no problems after having a preoperative ear, nose, and throat examination can be shown as the reason for a significant superiority in our success rate. This study of Ghasemi et al., in our opinion, clearly reveals the necessity of evaluating the nasal pathologies of the cases before dacryocystorhinostomy operations.

CONCLUSION

As a result, the use of bicanalicular tube intubation in external DCR in necessary cases seems to have high success rate in the treatment of nasolacrimal duct obstructions.

Author Contribution

DD: Contributed to the design, data collection and writing of the study
FO:The design of the study, contributed to the surgical and clinical follow-up of the cases
UG:Contributed to the data collection phase of the study

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