

The outcomes of surgical treatment in fistulous dacryocystitis

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Abstract. – BACKGROUND AND OBJECTIVES:

The aim of this study was to evaluate the outcomes of surgical management in fistulous dacryocystitis cases associated with nasolacrimal duct (NLD) obstruction.

MATERIALS AND METHODS: Twenty-two patients (14 female, 8 male) with fistulous dacryocystitis were included. The patients were divided into two groups as congenital (Group I) and acquired (Group II) groups. Fistula excision (FE) together with external dacryocystorhinostomy (DCR) and bicanalicular silicon tube (FCI Ophthalmics, Marshfield Hills, MA, USA) intubation (BSTI) were performed following medical therapy (Ofloxacin 0.3 % four times a day, intravenous ceftazolin (50 mg/kg/day in children and 2 g/day in adults and gentamicin (5 mg/kg/day in children and 3 mg/kg/day in adults). The groups were compared with each other in terms of preoperative medical therapy duration, time of silicone tube extubation, follow-up time, and surgical outcomes.

RESULTS: Group I included five patients with acute dacryocystitis and seven patients with recurrent dacryocystitis following probing, whereas Group II was comprised of 8 acute dacryocystitis and two recurrent fistulous dacryocystitis. Mean length of preoperative medical therapy was 14.1 ± 6.5 days for Group I and 11.9 ± 2.5 days for Group II. Extubation of the silicone tube was performed after 4.5 ± 1.2 months in Group I and after 4.6 ± 1.1 months in Group II. The patients were followed up for 13.5 ± 4.8 months in Group I and 14.3 ± 3.7 months in Group II. There was no significant difference between the two groups in length of preoperative medical therapy, time of extubation of the silicone tube, and follow-up time ($p > 0.05$). Postoperatively, patency of the nasolacrimal drainage system was verified by irrigation of the lacrimal ducts and use of fluorescein eye stain. In both groups, all patients underwent surgical treatment were treated successfully.

CONCLUSIONS: In fistulous dacryocystitis cases associated with the obstruction of NLD application of FE, external DCR treatment and BSTI appears as a valid surgical treatment option.

Key Words:

Fistulous dacryocystitis, Silicone tube, Nasolacrimal duct obstruction, Surgical treatment.

Introduction

In dacryocystitis cases associated with nasolacrimal duct (NLD) obstruction, formation of a fistula between the lacrimal sac and skin is a rare event where infected sac content is drained through the skin along a fistula. Fistulous dacryocystitis (FD) may be occurring due to failure of treatment in NLD obstruction¹. Pediatric fistulous dacryocystitis is most commonly observed after delayed treatment of congenital NLD obstruction². Among adults, following acute dacryocystitis or in cases with a history of dacryocystorhinostomy (DCR), recurrent dacryocystitis may present itself as a fistula connecting the infection with the skin surface³. The treatment of choice is surgical in both congenital and adult FD. In patients aged up to 2 years who develop dacryocystitis due to NLD obstruction, probing or high-pressure irrigation is applied, whereas bicanalicular silicone tube intubation (BSTI) is performed in cases aged between 2-5 years, and patients older than 5 years are subjected to DCR⁴. Among fistulous dacryocystitis cases with signs of predominant acute infection, firstly, acute symptoms should be regressed by medical therapy before proceeding on with the treatment by fistula excision (FE), external dacryocystorhinostomy (DCR) and bicanalicular silicon tube intubation (BSTI)⁵. We found no study in the literature focusing on the surgical treatment outcomes of congenital or acquired fistulous dacryocystitis cases associated with NLD obstruction. Our study is the first report in which primarily focused on the treatment outcomes of FD arising from congenital or acquired NLD obstruction.

Patients and Methods

In this study, fistulous dacryocystitis cases with a history of surgical treatment between Jan-

uary 2007 and March 2010 at the Oculoplasty Unit were retrospectively evaluated. The study was approved by Ethics Committee of Dicle University. Written informed consent was taken from all adults and parents of children. A total of 22 cases, 12 fistulous dacryocystitis cases arising from congenital NLD obstruction (Group I) and 10 fistulous dacryocystitis cases arising from adult NLD obstruction (Group II), were reviewed. Among patients with congenital NLD obstruction, the connection between the lacrimal sac and skin surface was confirmed by observing the passage of fluorescein dye (dropped into the conjunctival sac) through the fistula. In adult cases, the connection between the lacrimal sac and the skin was shown by passage of fluid, delivered from the punctum by a nasolacrimal cannula, through the fistula and to the skin surface. Our cases had presented with an infection profile complicated by a skin fistula (Figure 1). The acute infection was treated with intravenous cefazolin (50 mg/kg/day in children and 2 g/day in adults) and intravenous gentamicin (5 mg/kg/day in children and 3 mg/kg/day in adults).

Following verification of the connection between the fistula and the lacrimal sac by Bowman probe in patients with fistulous dacryocystitis associated with congenital NLD obstruction, fistula excision was performed via skin incision and the skin was sutured with 6/0 polyglactine. Thereafter, external DCR and BSTI were performed. In two cases, one of them 2-year-old and the other 3-year-old, only FE and BSTI were applied. Among adult fistulous dacryocystitis cases, the fistula pathway between the lacrimal sac and the skin was verified in a similar fashion with a Bowman probe. Skin incision was carried out



Figure 1. Multidetector CT enteroclysis showing thickening of terminal ileum, "target sign" and "perienteric stranding."

and eventually closed by 6/0 polyglactine. Then external DCR and BSTI were applied. Silicone tube was left inside for at least 4 months. All the cases were scheduled for follow-up assessment at 1 week as well as at 1, 3, and 6 months. Passage of fluid during the lacrimal irrigation, absence of collection of fluorescein dye dropped into the conjunctival sac, and lack of passage through the fistula, were deemed as signs of success.

Statistical Analysis

SPSS vs.11.5 was used for statistical analysis. The data was expressed as mean±standard deviation. Intergroup comparisons were carried out by Fisher's Exact test and Mann-Whitney U test. $p < 0.05$ was accepted as statistically significant.

Results

In Group I, 5 of 12 cases were fistulous primary acute dacryocystitis associated with NLD obstruction, whereas the remaining seven cases were fistulous dacryocystitis developed after a failed attempt of probing. In Group II, eight of the 10 cases were primary acute fistulous dacryocystitis, and the remaining two cases were recurrent fistulous dacryocystitis that developed after a failed attempt of DCR against chronic dacryocystitis. The mean age was $6.5 \pm 1.8^{1-12}$ years in Group I, while five were male and seven were female. The mean age was 42.4 ± 7.6 (25-58) years in Group II, while 3 were male and 7 were female (Table I). The length of preoperative medical therapy was 14.1 ± 6.5 days for Group I and 11.9 ± 2.5 days for Group II. The silicone tube was removed at 4.5 ± 1.2 months in Group I and at 4.6 ± 1.1 months in Group II. Follow-up period was 13.5 ± 4.8 months for Group I and 14.3 ± 3.7 months for Group II. There was no statistically significant difference between the two groups with regard to length of preoperative medical therapy, extubation time, and follow-up periods ($p > 0.05$) (Table II). All the cases in both of the groups were determined to have a patent lacrimal drainage system at the last follow-up assessment by observing passage of irrigation fluid through the lacrimal ducts, absence of collection of fluorescein dye dropped into the conjunctival sac, and lack of fluid presence at the fistular area. None of the cases demonstrated a complication such as displacement or migration of the silicone tube as well as corneal damage by the silicone tube.

Table I. The demographic and clinical characteristics.

	Group 1 (n = 12)			Group 2 (n = 10)		
	AFC	RFC	Total	AFC	RFC	Total
Number of cases	5	7	12	8	2	10
Gender (male/female)	2/3	3/4	5/7	3/5	0/2	3/7
Affected side (right/left)	2/3	2/5	4/8	4/4	1/1	5/5
Mean age (years)	5.8 ± 1.6	7.1 ± 1.9	6.5 ± 1.8	42.2 ± 7.4	43.0 ± 8.0	42.4 ± 7.6

AFC: Acute fistula cases; RFO: Recurrent fistula cases.

Discussion

Obstruction of lacrimal drainage due to nasolacrimal duct (NLD) with an occluded distal end, may lead to epiphora and inflammation of the lacrimal sac. Lacrimal sac enlarges in a convex protrusion towards anterior and inferior aspects because of the collection of infected material and may cause a fistular opening on the skin surface due to perforated lacrimal sac wall⁶. In cases demonstrating fistulous dacryocystitis, infection symptoms can be treated by systemic antibiotics. Definitive diagnosis requires closing of the fistula between the lacrimal sac wall and skin surface along with surgical correction of the NLD obstruction⁷. In our cases, infection symptoms were regressed as a result of systemic antibiotic treatment continued for 10-14 days, after which the patients were subjected to surgery.

Congenital NLD obstruction is a common event and it is believed to arise from a defect in the canalization of the columnar epithelial cells of the NLD⁸. Hydrostatic massage and topical antibiotics are effective within the first 6 months. In cases where those therapies fail to succeed, the treatment options are probing, BSTI and dacryocystorhinostomy (DCR)⁹. The recommended treatment for cases with dacryocystitis associated with congenital NLD obstruction which exhibit persisting epiphora and encrusted eye symptoms,

is high-pressure irrigation of the nasolacrimal drainage system and Bowman probing of the NLD up to 2 years of age. The suggested treatment for patients aged 2-5 years is BSTI, whereas DCR is preferred after 5 years of age¹⁰. In cases of congenital NLD obstruction where treatment is not applied on time, acute dacryocystitis may develop and the infection may lead to a fistulous connection to the skin. Those cases can be treated by FE, BSTI, and DCR¹¹. Our patients with fistulous dacryocystitis associated with a congenital NLD obstruction had a history of either no surgical treatment or only Bowman probing without any follow-up assessment. FE and BSTI were performed in two cases with 2 and 3 years of age. Other patients were older than 5 years of age and therefore all of them received FE, external DCR, and BSTI. Acquired NLD obstruction is generally categorized as primary and secondary. While primary NLD obstruction is idiopathic, secondary NLD obstruction occurs due to trauma, infection, inflammation, neoplasm, or mechanic reasons¹². Most common reason of adult acquired dacryocystitis is NLD obstruction associated with infection and it is treated with surgical correction of the obstruction by DCR¹³. DCR is often performed externally and success rates are reported to be 90-100%¹⁴. In adults, fistulous dacryocystitis may be observed because of NLD obstruction. Fistula formation is most com-

Table II. Congenital (Group 1) and adult nasolacrimal duct obstruction (Group 2). Comparison of data from the groups.

	Group 1 (n = 12)	Group 2 (n = 10)	p
Preoperative treatment time (day)	14.1 ± 6.6	1.9 ± 2.5	NS
Silicone tube removal time (month)	4.5 ± 1.2	4.6 ± 1.1	NS
Postoperative follow-up period (month)	13.5 ± 4.8	14.3 ± 3.7	NS
Surgical success n (%)	12/12 (100)	10/10 (100)	NS

NS: Not significant ($p > 0.05$).

monly encountered in cases with delayed acute dacryocystitis treatment or in patients with a recurrent dacryocystitis associated with a history of failed surgical repair¹⁵. Although there is no clinical study on surgical treatment of fistulous dacryocystitis, there are few reports reporting FE, external DCR, and BSTI application on chronic dacryocystitis cases¹⁶. In our study, all the cases with adult acquired fistulous dacryocystitis received external DCR, BSTI, and FE.

In conclusion, after we applied surgical treatment on cases of fistulous dacryocystitis associated with congenital and adult acquired NLD obstruction, fistula was observed to be closed and epiphora was resolved in all patients. Since we could not see any clinical studies on fistulous dacryocystitis in the literature, our success rates could not be compared with those of another study. In this work, high success rates may be associated with the low number of the study population. Application of FE, external DCR, and BSTI after an antibiotic therapy of 10-14 days can be preferred in patients with fistulous dacryocystitis associated with NLD obstruction as a surgical treatment option with satisfactory success rates. However, further studies including larger patients are required.

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