Transcaruncular Jones Tube Intubation without Dacryo-cystorhinostomy in Management of Canalicular Obstruction

Hesham A Enany and Mahmoud A Al-Aswad

Ophthalmology Department, Faculty of Medicine, Zagazig University
dr_henany@yahoo.com

Abstract: Purpose: To describe and evaluate the functional surgical success, complications, and degree of satisfaction after transcaruncular Jones tube intubation without dacryocystorhinostomy (DCR). **Methods:** This study evaluated 25 eyes of obstruction of the lacrimal canalicular systems with mean epiphora of 2.3 years. An incision was made on the side of the caruncle, and the lacrimal bone was penetrated between the lacrimal sac and the nasal mucosa by Bowman probe. Insertion of a Jones tube was made at the new lacrimal pathway, a punctum dilator or scissors was introduced through the caruncle and dilated across the lacrimal bone into the nasal cavity. The Jones tube was introduced over the probe into the nasal cavity, and fixed at the caruncle with non-absorbable suture material. This procedure was done without DCR. **Results** The overall success rate was 90%. The length of Jones tube used ranged from 16 to 30 mm. Complications of this technique included tube problems, in particular, downward displacement, which was corrected easily in the outpatient clinic, and extrusion. Other complications were frequent inflammation and conjunctival growth over the tube opening. **Conclusions** Jones tube intubation without DCR is a simple and useful procedure for correcting canalicular obstruction. Transcaruncular Jones tube is an operation of least manipulation and of short operative time.
[Hesham A Enany and Mahmoud A Al-Aswad. **Transcaruncular Jones Tube Intubation without Dacryo-cystorhinostomy in Management of Canalicular Obstruction.** *J Am Sci* 2012; 8(9):973-977]. (ISSN: 1545-1003). http://www.jofamericanscience.org. 134

Keywords: Early cord clamping, late cord clamping, Term Infants, Maternal and Neonatal Outcomes

1. Introduction

The Lester Jones tube is a hollow glass tube used to bypass the lacrimal canaliculi and sac, forming a direct conduit for tears from the conjunctival lake to the lateral nasal wall cavity. The surgical procedure for its insertion, originally described by Jones in 1962,[1] is known as conjunctivodacryocysto-rhinostomy (CDCR) and is the standard treatment for non reconstructable lacrimal canalicular obstruction. CDCR is indicated also in cases of obstruction of the medial segment of both upper and lower canaliculi in which no more than 5-8 mm of the lateral portion of each canaliculus remains patent.[2]

The presence of the glass tube as a permanent conduit of tears had a high functional success rate, but patients were annoyed from the tubes and the large number of patient-doctor visits thus causing psychological dissatisfaction of patients.[3] The uniqueness of the surgery and the absence of other alternatives to restore tear drainage in patients with marked canalicular damage encourage us to evaluate another surgical technique for CDCR. Insertion of inner canthal Jones tubes via a transcaruncular route without dacryocysto-rhinostomy is considered a recent technique for the treatment of canalicular obstruction. This procedure is simple and safe with no facial scarring, short operative time and high success rate.[4]

The aim of this study is to evaluate the safety and efficacy of Jones tube insertion without dacryocystorhinostomy DCR (transcaruncular Jones tube insertion) in the management of both upper and lower canalicular obstruction on the same side.

2. Patients and Methods

This study was carried out on 20 patients (25 eyes), who suffered from both canalicular obstruction at one side (less than 8 mm functioning canaliculus).These patients attended the ophthalmic outpatient clinic, Zagazig University Hospital in the period from June, 2004 to June, 2006. Patients included in this study were selected from patients suffering from epiphora subjected to full history taking. Full-Ophthalmologic examination with special attention to the lacrimal excretory system**,** Nasal examination (anterior rhinoscopy) and clinical diagnosis (Dye disappearance test, Jones primary dye test, diagnostic probing, lacrimal irrigation and radiological examinations e.g. Plain X-Ray, Dacryo-cystogram*,* C-CT scan).

Technique of transcaruncular Jones tube insertion (Figures 1-6)**:**

Decongestion of the nasal mucosa, by preoperative intranasal application of cotton packing soaked with oxymetazoline solution. Also, 2%lidocaine and 1: 10,000 epinephrine were applied intranasal between the inferior and middle turbinate. An incision was made on the caruncle, and deep penetration was performed into the lacrimal bone by Steven's scissors. The Bowman's probe was introduced smoothly through the caruncle advanced across the lacrimal bone, and then pushing by Bowman's probe #0 penetrating the

lacrimal bone. If the size of the tube was not fit with the width of tract, the osteotomy was widened by a punctum dilator or Steven's scissor.

The probe was advanced through the tract till nasal septum. The length of the tube was measured by estimating the length of the probe from the caruncle to the tip of the probe subtracting 2-3mm. The Jones tube was introduced over the probe into the nasal cavity. The probe was pulled out from the inserted tube. The tube was held in place with a 6-0 or 7-0 prolene suture passed through a hole in the flange and attached to the adjacent edge of the caruncle or passed around the collar of the tube and attached to the lower lid. The tube was injected with saline to clean the lumen from any debris and blood clots.

Postoperative treatment:

Broad spectrum antibiotic, analgesic & Anti-inflammatory for one week**.,** combined antibiotic and steroid eye drops and ointment for two weeks and nasal spray (Afrine® 0.50%), twice daily for 2 weeks to reduce nasal congestion. Patients should be advised to put the index finger over the conjunctival end of the tube, or close their eyes firmly while sneezing and coughing during the first six months, to avoid tube extrusion.

All the patients were followed up weekly for the first month, every 2 weeks in the second month, then monthly for at least up to 6 months. In each visit the patients were asked about, overflow of tears, discharge and discomfort. The tube and dye disappearance test were examined each time. Epiphora was scaled subjectively with a scale of zero to 4 as follow: (Scale zero = No epiphora), (Scale 1 = Occasional epiphora requiring dapping less than twice a day), (Scale 2 = Epiphora requiring dapping two to four times a day.),(Scale 3 = Epiphora requiring dapping five to ten times a day) and (Scale 4 = Epiphora requiring dapping more than ten times a day or constant tearing).

Functional outcome was assessed at the last point of contact with the patients. A completely successful outcome was defined as a comfortable, epiphora free eye, a moderately successful outcome was defined as a significant improvement without complete relief of epiphora and an unsuccessful outcome was defined as persistent, uncomfortable epiphora.

Figure 1: Jones tubes of different diameters and length

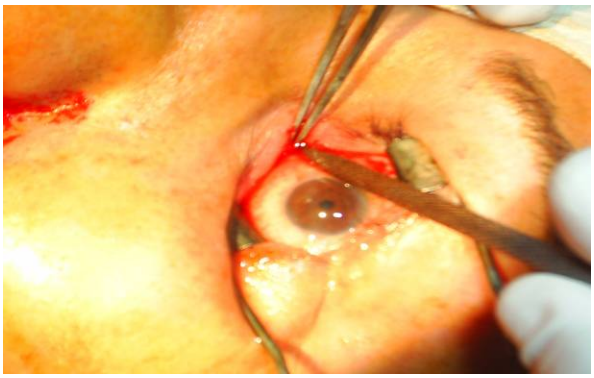

Figure 2: Formation of the tract by a punctum dilator.

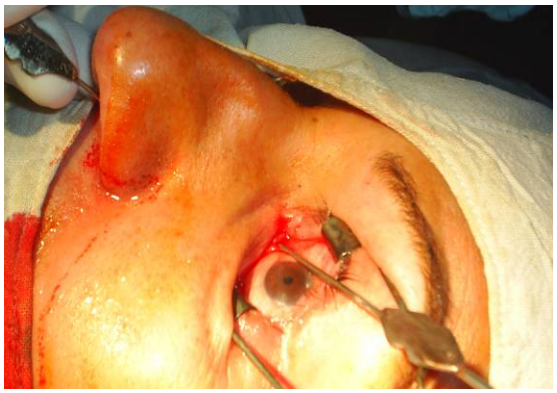

Figure 3: Detection of the Bowman probe in the nasal cavity by metal click.

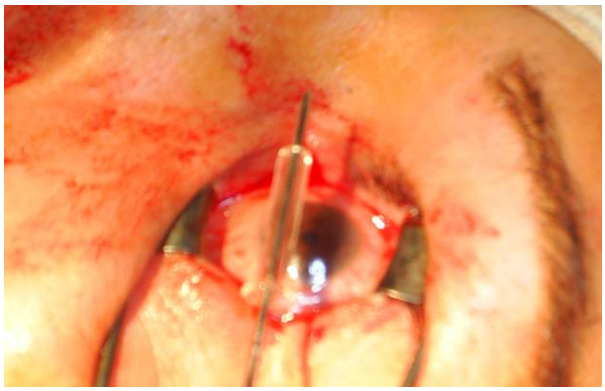

Figure 4: Introduction of Jones tube over the Bowman probe.

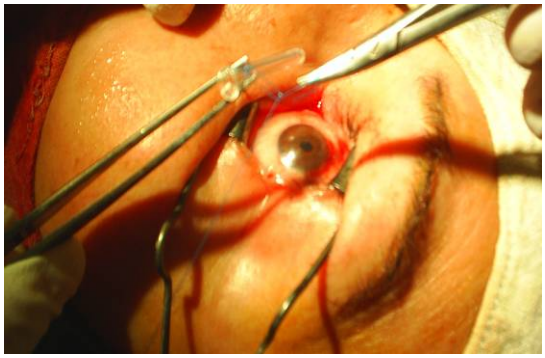

Figure 5: Fixation of Jones tube by non absorbable prolene suture.

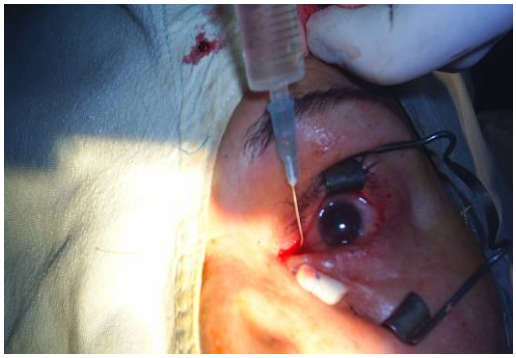

Figure 6: Irrigation of the tube.

3. Results

The age of the patients ranged from 16 to 60 years with mean age of 37 ± 8 years. There were 5 males (25%) and 15 females (75%) with females to males ratio is 3.1 with a highly significance of females. The most common presentation was idiopathic canalicular obstruction (36%), the second was failed DCR with intubations (24%).

All cases involved in this study were presented with +3 or +4 grade of epiphora which graded according to fluorescein dye disappearance test. These scales used to assess the success rates. A completely successful outcome was achieved in 17 cases (68%).moderately successful outcome was achieved in 5 cases (20%) and an unsuccessful outcome was present in 3 cases (12%). A significant improvement or complete relief of epiphora was achieved in 88% of cases. The reasons for failure were malposition of the tube and recurrent obstruction (Table 2).

Table 1: Causes of the canalicular obstruction among the studied eyes.

Clinical presentation and etiology	Studied eyes	
	No	%
Failed classic DCR with intubations	6	24
Chronic dacryocystitis with repeated probing	3	12
Failed closed DCR with damage of both canaliculi	4	16
Trauma to the face involving the canalicular system	3	12
Idiopathic	9	36
Total	100	100

Table 2: Shows functional outcome.

Functional Outcome	Epiphora score	Residual Dye (5 mins)	No.	%
Completely successful	0	0	17	68%
Moderately successful	1-2	0	5	20%
Unsuccessful outcome	3-4	+1	3	12%

Table 3: Operative and postoperative complications among the studied eyes.

Operative complications	No	%	Postoperative comp.	No	%
Hemorrhage from angular vein	-	-	Epistaxis	0	0
Sever bleeding from nasal mucosa	4	16	Bad cutaneous scar	0	0
Broken tubes	3	12	Lateral displacement	5	20
			Granuloma.	3	12
			Medial displacement.	0	0
			Tube extrusion.	5	20
			Obstruction of lumen	all	100

Operative Data:

Operative time was ranged from 16 to 30 min with (mean ±SD = 20.7 ± 3.8). **R**egarding the operative complication, there were no cases of hemorrhage from angular vein, also there were 4 cases of bleeding from the nasal mucosa (16%). There were 3 cases of broken tubes (12%). All cases were managed by their replacement by other tubes after removal of the broken tube.

Postoperative complications:

13 eyes out of 25 eyes of cases of this study showed postoperative complications. These complications were summarized in table (3). The most common and earliest complication was excess mucoid discharge obstructing the lumen, (Figure 7) that occurred in all cases starting from the first postoperative day. Irrigation of the lumen of the tube with saline in addition to topical antibiotic eye drops, successfully helped in removing the obstruction. Lateral displacement of the Jones tube was detected 2 weeks postoperatively in 5 cases (20%). It was due to too long tube, or due to narrow nares (Figure 8). Management of lateral displacement in the other patients was by removal of the tube and insertion of a new one over a Bowman's probe according to proper calculations.

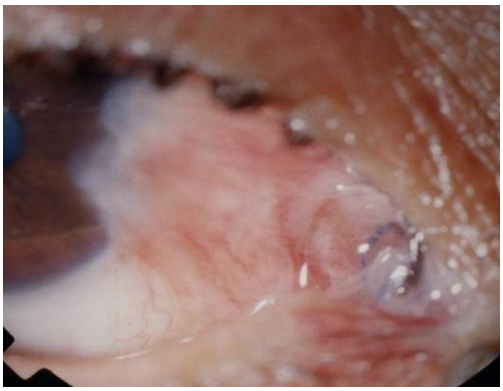

Figure 7: Obstruction of the lumen

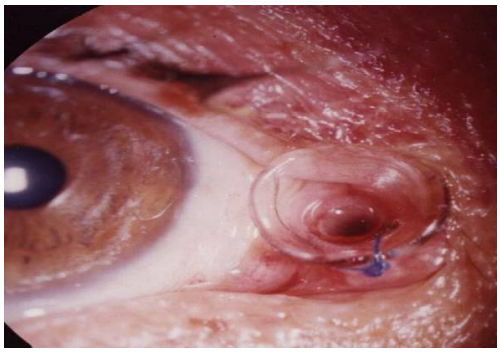

Figure 8: Lateral displacement of the tube

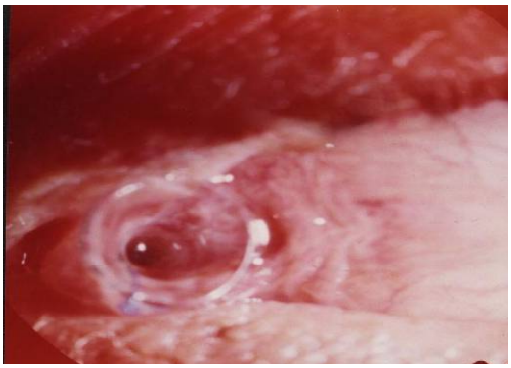

Figure 9: Conjunctival granuloma

4. Discussion

Lacrimal canalicular bypass surgery with the Lester Jones tube is indicated for epiphora caused by lacrimal obstruction when there is inadequate canalicular tissue to allow reconstruction (less than 8 mm of patency from the punctum). Despite many long-term complications, this remains the most effective treatment for relief of epiphora in these situations. The Jones tube is a permanent glass prosthesis that requires ongoing, long-term care of the patient and attending ophthalmologist to maintain patency and anatomic position. [5]

The female-to-male ratio in this study was (3.1) lies more than the previously reported range (1.07–2.03) [5,6,7]. In all other reports there has been a predominance of female cases. One postulated reason for this universal observation is that cosmetics may play a role in the development of canalicular obstruction. [5]

A number of causes for canalicular obstruction have been described. In this work the most common causes for canalicular obstruction were idiopathic (36%) this was compared to other studies. Idiopathic and traumatic obstruction were the most common causes in studies carried out in Turkey,[7] India,[6] Chicago.[8] On the other hand studies carried out at the Lacrimal Clinic at Moorefield's Eye Hospital in London, however, showed a predominance of post herpetic and traumatic cases, with the idiopathic group comprising a smaller proportion.[5] Other causes of canalicular obstruction in this study were 3 cases of trauma, 6 cases of failed previous classic DCR, 3 cases of failed probing, and 4 cases of failed closed DCR.

An improvement or complete relief of epiphora was achieved in 22 cases (88%) in our study, whereas larger, more recent studies have reported success rates of 90% to 98.5%. Steinsapir *et al.*[8] in 1990 (96%), Zilelioglu and Gunduz[6] in 1996 (91%), also Charmaine *et al.* [5] in 2004 (94%). These studies defined success as a comfortable dry eye, together with a patent, well-draining tube.

A comfortable, epiphora-free eye was achieved in 17 of our cases (68%). We found an intermediate group needed to be defined in this study. Several cases demonstrated patent, well-positioned, well-draining tubes on examination but were subjectively associated with intermittent, although significantly improved, epiphora. Although these cases may have been classified as surgical successes on the basis of the examination findings, we felt that the presence of symptoms, even intermittent, could not be ignored. We therefore classified them as moderate successes.

Epiphora would be precipitated by reversible mucus plugging, a degree of movement of the tube resulting in variable drainage, upper respiratory tract infections or allergies, and windy weather or air-conditioning. Upper respiratory tract infections cause nasal mucosal swelling, which can block the medial end of the tube temporarily. Dry or windy air precipitates reflex tear hyper secretion and a watery eye despite there being excellent tear drainage via the tube. These results were comparable to other studies, such as Charmaine *et al.*[5] in 2004 (70%), Rosen *et al.*[9] in 1994 (75%) and Rose and Welham[2] in 1991 (80%).

The mean of operative time in this series was 20.7 min, ranged from 16 min to 30 min. This result agreed with Lee[10] in 2001, who had mean operative time of 20min. This result was incomparable to the operative time in other series in which classic DCR

were performed which was ranged from 71 to 120 min with mean of 89 min.

The incidence of bleeding from nasal mucosa in our patients was 16%.This result was much less than that of Lee [4] in 2001, who had an incidence of bleeding from nasal mucosa of 44.4%, because Lee in his study combined his procedure with middle turbinectomy in 55 eyes and septoplasty in 2 eyes.

Postoperative lumen obstruction was the earliest and most common complication in this study. It occurred in all cases, with mucoid discharge. This result was comparable to all other studies like, Steinsapir[8], Zilelioglu and Gunduz[7], also Charmaine[5]

Lateral displacement of the tube was found in 5 cases (20%) that occurred two weeks postoperatively. We attributed such complication to improper assessment of the length of the tube needed and implantation of a too long tube. This complication rate seemed to be more than in other studies such as Sekhar[6] where they had a 17.4% incidence of lateral displacement of the tube and 10.7% in the Rosen *et al.*[9] Calculation of the proper tube length by dipstick technique mentioned earlier may help to minimize this complication.

The law rate of medial displacement in this study caused by that small bony ostium adjusted the tract width and prevented tube hyper mobility that led to the displacement. This complication seemed to be more in other studies, such as Sekhar[6] who had (9%) medial displacement and more than Can[10], who had (4.5%). This complication attributed to excessive dilatation of the tract during surgery.

Granuloma was found in 3 cases (12%) in postoperative period. All cases of the granuloma were over the lateral end of the tube. This was attributed to friction between the flange of the tube and the conjunctiva. These results were comparable to other studies such as, Sekhar[6] who recorded a 16.9%.

Tube extrusion or external loss of the tube occurred in 5 eyes, (20%). Tube loss attributed to early removal of the silk stitch fixing the tube to the lid and also the patients forgot to put their finger over the medial canthal area during sneezing and coughing. This result was comparable to that of Sekhar[6] (28%), Rosen *et al* [9](20%), and Zilelioglu and Gunduz[7] (18%). This result was more than that of Lee [4], who reported 1.6% incidence of tube extrusion and he attributed this low incidence to small adequate ostium size.

8/8/2012

Corresponding author
Hesham A Enany
Ophthalmology Department, Faculty of Medicine, Zagazig University
dr_henany@yahoo.com

References

1. Jones LT. The cure of epiphora due to canalicular disorders, trauma and surgical failures on the lacrimal passages. Trans Am Acad Ophthalmol Otolaryngol., 1962; 66: 506–24.
2. Rose GE, Welham RAN. Jones Lacrimal canalicular bypass tubes: Twenty-five years' experience. Eye, 1991; 5: 13.
3. Putterman A. Conjunctivodacryocysto-rhinostomy. In: John Linberg, sd. Basic lacrimal surgery. 1st ed. New York. Churchill Livingstone 1988; 281-314.
4. Lee JS, Jung G, Lee JE, Oum BS *et al.* The treatment of lacrimal apparatus obstruction with the use of an inner canthal Jones tube insertion via a transcaruncular route, Ophthalmic Surg Laser, 2001; 32: 48-54.
5. Charmaine Lim MBBS, Peter Martin, Ross Benger, *et al.* Lacrimal canalicular bypass surgery with the Lester Jones tube. Am Ophthalmol., 2004; 137:101-8.
6. Sekhar GC, Dortzbach RK, Gonnering RS, *et al.* Problems associated with conjunctivodacryocystorhinostomy. Am J Ophthalmol., 1991; 112: 502-6.
7. Zilelioglu G, Gunduz K. Conjunctivo-dacryocystorhinostomy with the Jones tube. A 10 years study. Doc Ophthalmol., 1996; 92: 97-105.
8. Steinsapir KD, Glatt HJ, Puttermann HM. A 16-year study of conjunctivodacryo-cystomy J Ophthalmol., 1990; 109:387-93.
9. Rosen N, Ashkenazi J, Rosner M. Patient dissatisfaction after functionally successful conjunctivodaryocystorhinostomy with Jones tube. Am J Ophthalmol., 1994; 117: 636-42.
10. Can I, Can B, Yarangumeli A, *et al.* CDCR with buccal mucosal graft: Comparative and histopathological study. Ophthalmic Sung Lasers, 1999; 30: 98-104.