

# Soft tissue conjunctivo-rhinostomy

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**PURPOSE.** *To evaluate the results of implantation of a tubular prosthesis between the medial palpebral canthus and the nasal fossa, through the soft tissues of the face, in cases of irrecuperable damage of the lacrimal canaliculi.*

**MATERIAL AND METHODS.** *Fifty eyes with canalicular destruction were operated, placing a silicone and Pyrex tubular prosthesis between the lacrimal caruncle and the nasal vestibulum, running almost vertically through the soft tissues of the face, without osteal perforation.*

**RESULTS.** *Lacrimal flow was restored in 47 cases. There were three cases of dislocation of the prosthesis, three infections and five papillomata.*

**CONCLUSIONS.** *Vertical conjunctivo-rhinostomy without osteal perforation is an easy and efficient solution for irrecuperable occluded canaliculi. (Eur J Ophthalmol 2001; 11: 323-7)*

**KEY WORDS.** *Soft conjunctivo-rhinostomy, Laco-rhinostomy, Carunculo-rhinostomy, Lacrimal canaliculus obstruction*

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## INTRODUCTION

When the lacrimal canaliculi are obstructed or removed, the principal objective of restorative surgery must be to repair the natural pathways. Only when this is impossible should one consider creating a pathway that is anatomically distinct from the normal one.

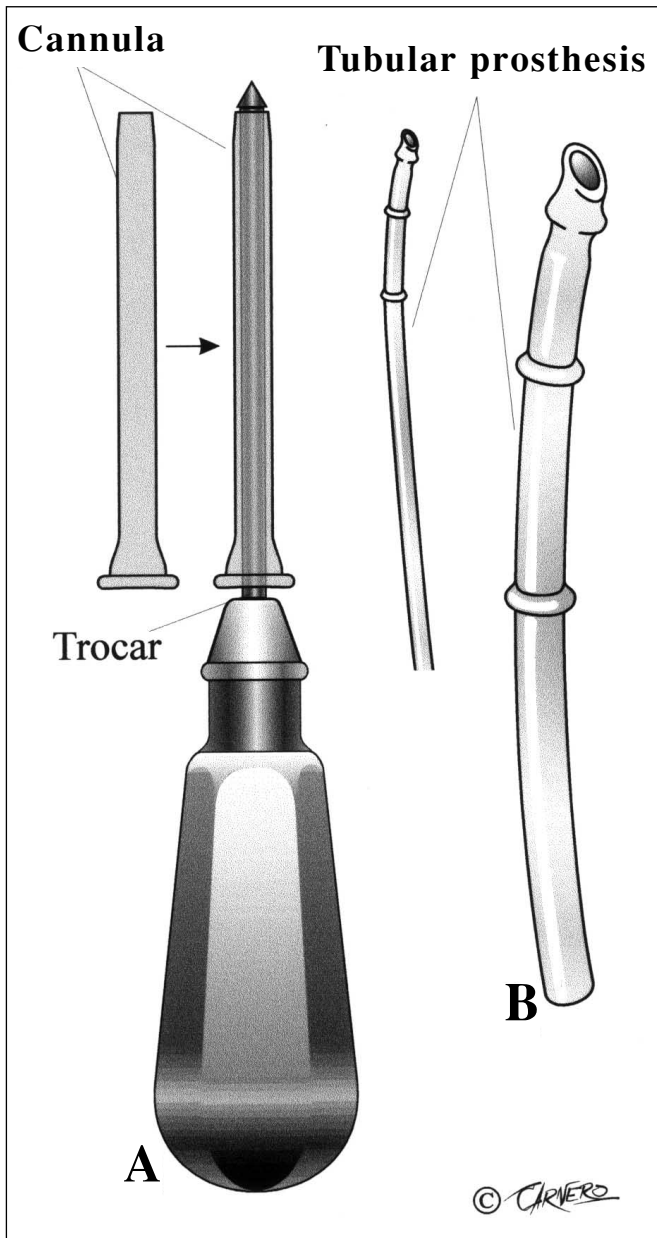
Operations to create artificial pathways to date have diverted the lacrimal flow into the nasal fossa (conjunctivo-rhinostomy) (1-3), or the maxillary sinus (conjunctivo-antro-rhinostomy) (4). These operations perforate the bony structure of the face, in a rather complex surgical technique with frequent complications, the most disturbing being occlusion. To avoid the latter, prosthetic tubes have been introduced (5). In order to avoid opening an osteal window, one of us (JM) some years ago introduced the creation of a new way through the soft tissues of the face between the conjunctiva and the mouth (soft conjunctivo-bucostomy) (6), or between the conjunctiva and the nose

(soft conjunctivo-rhinostomy) (7, 8, 9). We present and discuss here our experience in our latest cases of prosthetic soft conjunctivo-rhinostomy.

## MATERIAL AND METHODS

Fifty eyes with irrecuperable destruction of both lacrimal canaliculi of patients attending the Department of Ophthalmology of the Hospital Ramón y Cajal (University of Alcalá, Madrid, Spain) between 1995 and 2000 underwent a soft conjunctivo-rhinostomy. The causes of the canalicular obstruction were extensive viral canaliculitis, Stevens-Johnson syndrome, ocular pemphigoid, epithelioma, irradiation, chemical caustication, or unknown.

The soft conjunctivo-rhinostomy was done by a technique which consists of placing a tubular prosthesis between the medial canthus of the lacrimal basin and the posterior part of the vestibulum nasi, or the low-



**Fig. 1 - A.** Trocar with the cannula mounted around the mandrin, and cannula isolated. **B.** Prosthetic tube, showing the silicone tube, with the Pyrex upper tip.

er part of the atrium nasi. The tube is implanted in an almost vertical position through the soft tissues overlying the bony structure of the face.

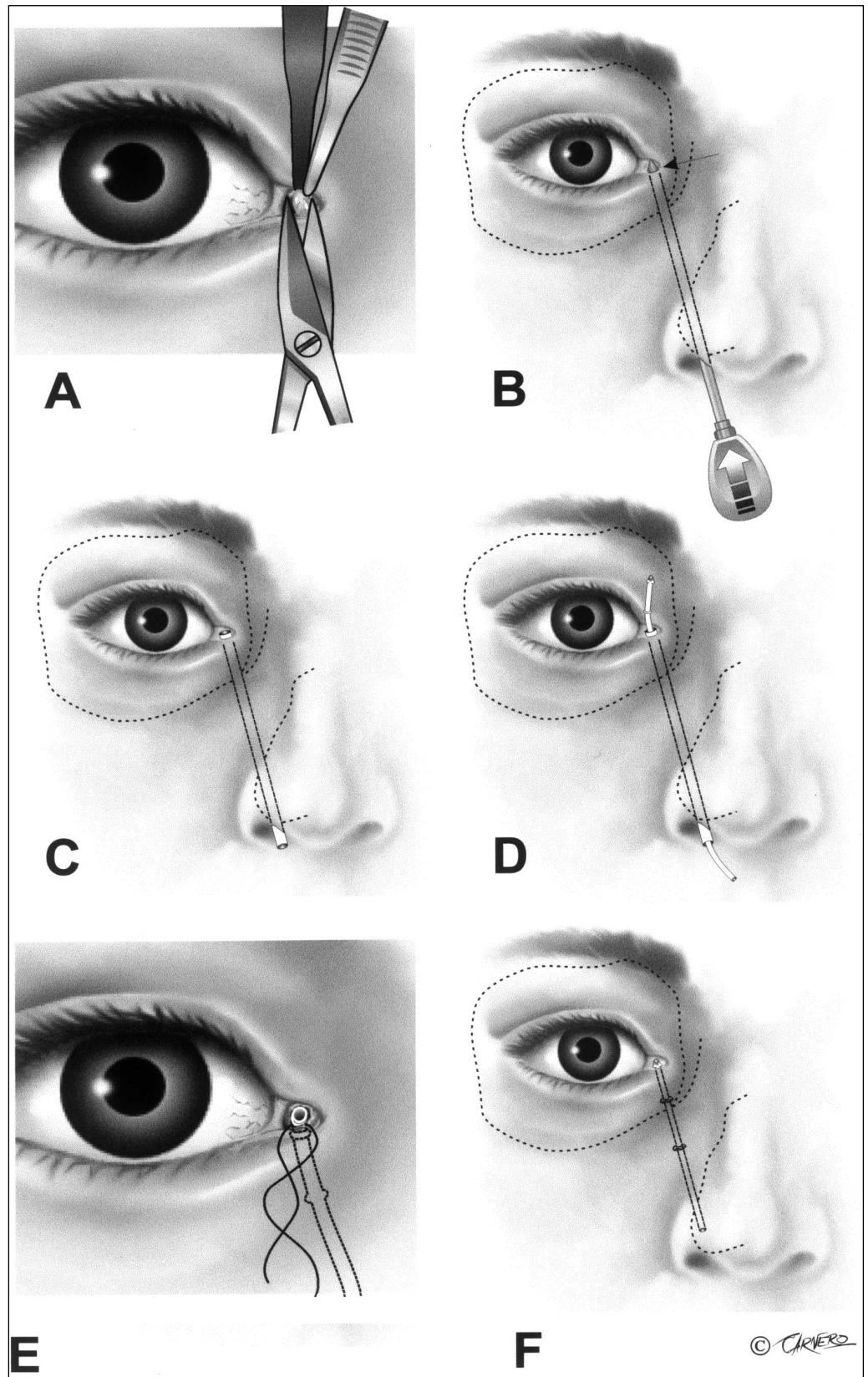
A trocar and a tubular prosthesis are used to practice the soft conjunctivo-rhinostomy. The trocar (Fig. 1A) consists of a 5 cm long cannula with an internal diameter of about 3mm, and a mandrin with a sharp point on its distal end which, when introduced

into the cannula, stands out several millimeters.

The tubular prosthesis (Fig. 1B) is a silicone tube into whose upper end a short Pyrex cylindrical tube is inserted. This prosthesis is 8 cm long for easy management, but at the end of the surgical procedure about 4 cm are cut and eliminated. The external diameter of the silicone tube is 2 mm, and its lumen 1.5 mm. The silicone tube has two raised silicone rings on its outer surface, which when the prosthesis is embedded in the soft tissues of the face prevent upward and downward displacement. The Pyrex upper terminal is a small 4 mm long diaboloid-shaped tube; its upper end is tapered so its opening can be oriented anterolaterally to the lacrimal lake, and its margin is fringed, to avoid the downward intrusion of the prosthesis; its lower end also has a raised lip to be introduced in the end of the silicone tube and achieve good fixation between the two parts of the prosthesis. The device is manufactured by Mediofisico (mediofisico@jet.es).

The surgical technique begins by infiltration of the tissues between the caruncula lacrimalis and the vestibulum nasi with local anesthesia. Then, the caruncular bed is prepared by resecting the upper half of the caruncle using forceps and scissors (Fig. 2A). The sharp point of the trocar is then introduced upward in the nostril, and perforates the lateral wall of the nasal aperture just in front of the *apertura piriformis* of the skull. The trocar is then advanced upward over the facial osseous plane creating a tunnel under the muscular plane (Fig. 2B). In order to facilitate the outlet of the trocar in the caruncular precise point, the straight terminal of a wide L-shaped needle can previously be introduced downward through the caruncular wound to receive the point of the trocar and to guide it.

When the trocar comes out at the prepared caruncular bed, the mandrin is removed downward, leaving the cannula in position (Fig. 2C). The lower end of the silicone tube is then introduced into the upper end of the cannula, until it exits the nostril (Fig. 3D). The cannula is removed and the excess tube is cut off, leaving 2 mm to extend into the nasal fossa. The Pyrex opening at the top end should be in the place that the caruncle occupied (Fig. 2E). A 6-0 suture fixes the Pyrex portion of the prosthesis to the remnant caruncle for about 10 days (Fig. 2F).



**Fig. 2 -** Steps of the soft conjunctivo-rhinostomy: **A.** Excision of the upper portion of the caruncle. **B.** Introduction of the trocar into the vestibulum nasi. Perforation of the lateral wall at the limit between the vestibulum nasi and the atrium nasi. Sliding the trocar upward until the sharp point of the mandrin sprouts out into the caruncular bed. **C.** Removing the mandrin, leaving the cannula in place. **D.** Introduction of the tubular prosthesis into the upper hole of the cannula, until the lower end of the prosthesis comes out at the lower end of the cannula. **E.** Fixation of the Pyrex tip to the caruncular tissue with a suture for some days. **F.** Final position of the tubular prosthesis.

## RESULTS

The operation time is about 10 minutes. No patient needed supplementary local anesthesia, but in some cases the patient felt more comfortable during the procedure if a drop of topical anesthesia was instilled in the lacrimoconjunctival basin.

In the 50 cases presented, with a mean follow up of two years, we have found:

- 5 cases of conjunctival papillomata around the Pyrex upper tip of the tube;
- 3 cases of infections of the tunnel;
- 2 cases of rotation of the tube with repetitive occlusion of the outlet by caruncular tissue
- 2 cases of upward dislocation of the prosthesis;
- 1 case of downward dislocation of the prosthesis.

Tube obstruction by mucus is not rare, but is easy to correct. Two cases of infection of the tunnel through the soft tissues of the face could not be cured despite antibiotics and antiinflammatory drugs, but was cured soon after removing the prosthesis. A case of downward displacement of the prosthesis required extraction through the nostril, and the patient refused to repeat the procedure. The lacrimal flow was restored in 47 cases.

## DISCUSSION

The operation can be performed on an out-patient basis using local anesthesia. It is easy to perform, and comfortable for the patient. The complete procedure lasts about 10 minutes. The lacrimal pathway does not suffer any modification nor does the patient's face.

The prosthesis may eventually become blocked, either by deposits within the lumen or by mucous plugs at its nasal end. This is a relatively frequent complication that can be corrected with irrigation or by passing a thread with a series of knots (carefully, to avoid dislodging the tube) through the lumen to remove the obstruction. Another harmless complication is the triggering of papillomata, when the prosthesis chafes against the mucosa of the lacrimal lake. It is not particularly serious and can be treated easily by surgical excision of the papilloma.

An important complication is displacement of the prosthesis. This occurs if it was not correctly positioned during the operation. It can be avoided by suturing the Pyrex tip to the caruncle and securing this suture for a few days. Infection of the soft tissues of the face surrounding the tunnel that houses the prosthesis is another important complication. Two of three

**TABLE I - COMPLICATIONS OF CONJUNCTIVO-RHINOSTOMY WITH MURUBE'S TUBE AND WITH JONES' TUBE**

	Murube's tube	Jones' tube		
		Sekhar et al	Rosen et al	Lee et al
Number of cases	50	69	125	124
Follow up (years)	1-5	2-18	1-9	0.75-2.1
Total complications	13	63	59	41
Malposition/rotation	2	-	7	-
Extrusion/loss of tube	-	19	24	-
Upward or lateral displacement	2	12	-	2
Downward or medial displacement	1	9	-	13
Wrong size	-	-	13	-
Upper granulation or conjunctival tissue redundancy	5	10	12	13
Granulation at nasal opening	-	9	1	6
Infection	3	4	-	7
Intractable pain	-	-	1	-
Dry eye	-	-	1	-

cases could not be solved with medical treatment, but resolved after removing the prosthesis; the tubes were replaced two weeks later.

In most cases the soft conjunctivo-rhinostomy restores lacrimal flow without causing complications, and needs only occasional care. Conjunctivo-rhinostomy with Jones' tube implantation is considered the "reference standard" for the treatment of extensive damage of the canaliculi. The table shows the rate of complications with our tubes and the rates given by three other authors (10-12) with Jones' tubes. The results do not correspond exactly because of the different concepts considered by the authors, but in general they seem to be a little better with our tubes.

One of the differences to be emphasized is that the size of the Jones tubes is often inappropriate, and this is only discovered when the tube is already placed, so it has to be replaced. Therefore, surgeons planning to implant Jones' tubes should have a large selection of sizes to hand so they are prepared for all situations. With our tubes the length is adjusted at the end of the operation by cutting the surplus off at the nasal end.

Another important difference is that with the Jones tube, small medial displacements of the tube or moderate congestion of the *nasal mucosa* can occlude the nasal end, and a turbinectomy or septoplasty is frequently necessary. This is not the case with our tubes,

as their lower end comes out in a spacious area. Furthermore, the nasal end of Jones' tubes needs nasal endoscopy to be examined, while ours can be seen directly in the *vestibulum nasi* or in the inferior part of the atrium. Finally, the position of the Jones tube is oblique, more horizontal than vertical. Our tubes are positioned almost vertically, making lacrimal flow easier.

## CONCLUSIONS

When the lacrimal pathways are lacking completely, or are not recuperable, it is possible to put a prosthetic tube of Pyrex and silicone in their place, running almost vertically from the canthus internus to the vestibulum or to the *atrium nasi*, in front of the bony wall of the *os maxillare*, through the fleshy parts of the face. This technique of soft conjunctivo-rhinostomy does not involve perforation of the bone, and is very simple, quick and efficient.

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