Research Article

External versus Transnasal Endoscopic Management of Nasolacrimal Obstruction

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Abstract
Background: Dacryocystorhinostomy (DCR) has been the standard procedure for acquired nasolacrimal duct obstruction. Lacrimal sac can be approached (١) Conventional External (Ex-DCR) or (٢) Endoscopic (EN-DCR). **Objective:** To evaluate the differences between external and transnasal endoscopic approach in management of nasolacrimal obstruction.
Materials and Methods: This study included Sixty patients with distal lacrimal passage obstruction underwent DCR, fourty patients with primary transnasal EnDCR (٣٥ females and ٥ males) and twenty patients (١٤ females and ٦ males) with ExDCR from the period of January ٢٠١١ till January ٢٠١٣ they were followed up at ٣ and ٦ months for surgical outcome. **Results:** This study included ٦٠ patients. The patients were divided randomly into two groups (٤٠ underwent EnDCR which subdivided in to two sub groups ٢٠ underwent endoscopic silicone tube, ٢٠ underwent endoscopic otologic t-tube) and the other ٢٠ underwent external DCR. It was observed that the age of the patients ranged from ١٨ to ٦٥ years with a mean age of ٣٦.٦١ years, ٥٦.٧٪ of them were in the ٣rd and ٤th decades of life. There were ١١ males and ٤٩ females in the study. The success rate defined as absence of epiphora in external DCR was ٨٠٪ at ٣months and the same at ٦ months and in transnasal endoscopic DCR was ٨٧.٥٪ as ٣ months and ٨٥٪ at ٦ months. **Conclusion:** both external and endoscopic DCR are effective surgical approaches for nasolacrimal duct obstraction with comparable sucses rate but endscopic DCR with silicone tube in our study more superior than xternal and endoscopic otologic t-tube
KeyWords: DCR**,** Ex-DCR, EN-DCR

Introduction
The lacrimal drainage system includes the upper and lower punctum, superior and inferior canaliculus, common canaliculus, lacrimal sac, and nasolacrimal duct (NLD). Any obstruction in this system results in complaints of epiphora and mucoid or purulent discharge, as well as recurrent swelling in the medial canthal region. If the patient does have continuous epiphora, and does not benefit from topical or systemic antibiotic treatment, surgery is usually the treatment of choice. Dacryocystorhinostomy (DCR) is performed either externally or transnasally (Sprekelsen and Barberan, ١٩٩٦; Rice, ١٩٩٠).

DCR is the standard surgical procedure for the nasolacrimal outflow tract obstruction in which the lacrimal sac is connected directly to the nose by removing the layers of bone and mucosa that separate these two structures. The earliest surgical intervention for this purpose performed by Toti in ١٩٠٤, was an external DCR (ExDCR) procedure. The external approach involves a skin incision, drilling or rongeuring the bone of the anterior lacrimal crest and lacrimal sac fossa, and suturing anterior and/or posterior flaps to create a mucosal fistula into the nose (Dolman, ٢٠٠٣).

ExDCR is considered the mainstay of the surgical treatment in chronic dacriocystitis and in more than ٩٠٪ of cases; the surgical outcome is successful (Watkins et al., ٢٠٠٣). However, this procedure is not without drawbacks such as external scar

formation, injury to the medial canthal ligament and periorbital echymosis that are overcomed by the alternative endoscopic method (Cokkeser et al., ٢٠٠٣).

The endonasal approach was introduced by Caldwell at ١٨٩٣ and later modified by west (Wielgosz and Mroczkowski, ٢٠٠٦). Today, EnDCR is typically performed by otorhino-laryngologists with the use of a nasal endoscope (Wormald, ٢٠٠٦; Tripathi et al., ٢٠٠٢; Muellner et al., ٢٠٠٠).

EnDCR has evolved as an alternative treatment option with significant advantages, including wide surgical field, minimal intraoperative bleeding, avoidance of scarring, and preservation of the pumping action of the orbicularis oculi muscle (Bakri et al., ١٩٩٩; Hartikainen et al., ١٩٩٨).

Patient and methods

Study design, prospective, interventional, clinical study was conducted in department of otorhinolaryngology in conjuction with ophthalmology, in minia university hospital Duration of study: two years, from January ٢٠١١ till January ٢٠١٣, No. of cases: ٦٠ cases (٤٠ EnDCR, ٢٠ ExDCR),

Preoperative assessment

Inclusion criteria:

١- Adults aged over ١٦years
٢- Failed conservative treatment in the form of systemic antibiotics, steroid/antibiotic eye drops, decongestant nasal drops and local nasal steroid spray.
٣- Distal nasolacrimal passage obstruction
٤- History of nasal obstruction in the same side of epiphora
٥- Fit for surgery under general anesthesia
٦- Patients consenting for operation

Exclusion criteria:

١- Previous nasolacrimal surgery
٢- Tumors of the lacrimal passage, nose or paranasal sinus
٣- Nasal polyposis
٤- Presaccal obstruction
٥- Eye disease causing increased lacrimation and eyelid malpositions
٦- History of nasal trauma
٧- CNLDO.
٨- Mucocele or pyocele of the lacrimal sac

Subjective assessment:

The chief complaint was epiphora. Detailed medical history taking included:

- Onset, course and duration of epiphora.
- Side of lacrimal obstructive whether left, right or bilateral.
- History of allergy, history of eye disease and medication, known systemic disease.
- History of previous lacrimal operations (type, side and time of operation).
- History of radiation, nasal trauma and nasal surgeries.

Objective assessment

- Distal lacrimal passage obstruction was confirmed by the presence of positive regurge of pus, mucous or clear fluid through one or both puncta.
- The patency of the nasolacrimal system is assessed by syringing.
- A blunt lacrimal needle (٢٥-gauge) is introduced into the inferior punctum and saline is injected. If the lacrimal system is obstructed, reflux of saline will occur through the upper punctum. If saline passes into the nose without reflux, the lacrimal system is patent but not necessarily functional.
- Routine preoperative nasal endoscopy to exclude intranasal pathology and detect cases that may need additional procedures e.g hypertrophied middle turbinate or significant degree of deviated septum.
- Ocular causes of epiphora were excluded with the help of an ophthalmologist.
- Only cases with confirmed distal obstruction were included in the study.

Results

Laterality of symptoms:

٦٠٪ of the patients (٣٦) presented with left sided symptomatology as compared to ٤٠٪ (٢٤) with right sided symptomatology.

٤٠ patients underwent EnDCR ٢٠ of them by silione tube (٤ males and ١٦ females) and other ٢٠ by T-tube (٣ males and ١٧ females) while ٢٠ patients underwent ExDCR (٤ males and ١٦ females) as shown

in **fig. (٣٤)**

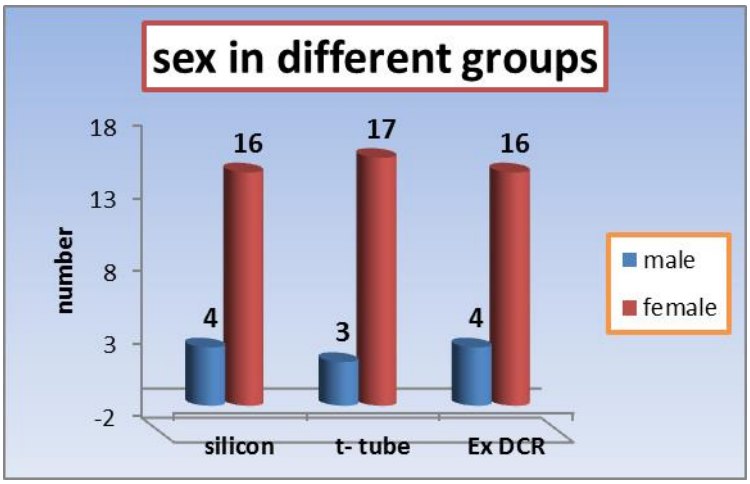

Fig (٣٤): Showing sex in different groups

Table (٢): Time taken for surgery

Duration in minutes	ExDCR		EnDCR	
	NO	%	NO	%
< ٣٠ Minutes	-	-	٨	٢٠٪
٣٠ -٤٥ Minutes	٧	٣٤٪	١٦	٤٠٪
٤٦-٦٠ Minutes	١٠	٥٠٪	١٢	٣٠٪
> ٦٠	٣	١٥٪	٤	١٠٪
P-Value	٠.٠٠٢ **			

It was observed that EnDCR toke less time (mean duration= ٣٩.٧٥m ±١٣.٤m) as compared to ExDCR (mean duration = ٥٢.٥m ±١٥.٠٨m), which was statistically significant (P =٠.٠٠٢), as the duration of surgery was shorter in EnDCR.

The mean duration of follow up was ٦ months ranging from ٥ to ٨ months for all patients in this study. Findings at ٣ and ٦ months were documented.

Results at ٣ months:

Subjective Assessment

Table (٣): Showing subjective outcome between endoscopic and ExDCR

	EnDCR	ExDCR	P value
Subjective assessment:			
Symptom free.	٢٣(٥٧.٥٪)	٩ (٤٥٪)	٠.٧٩٤
Significantly improved.	١٢ (٣٠٪)	٧ (٣٥٪)	
Slightly improved.	٤ (١٠٪)	٣ (١٥٪)	
No improved.	١ (٢.٥٪)	١ (٥٪)	
Worse.	٠ (٠٪)	٠ (٠٪)	
Fate: n (%)			
Success:	٣٥ (٨٧.٥٪)	١٦ (٨٠٪)	٠.٤٤٣
Failed.	٥ (١٢.٥٪)	٤ (٢٠٪)	

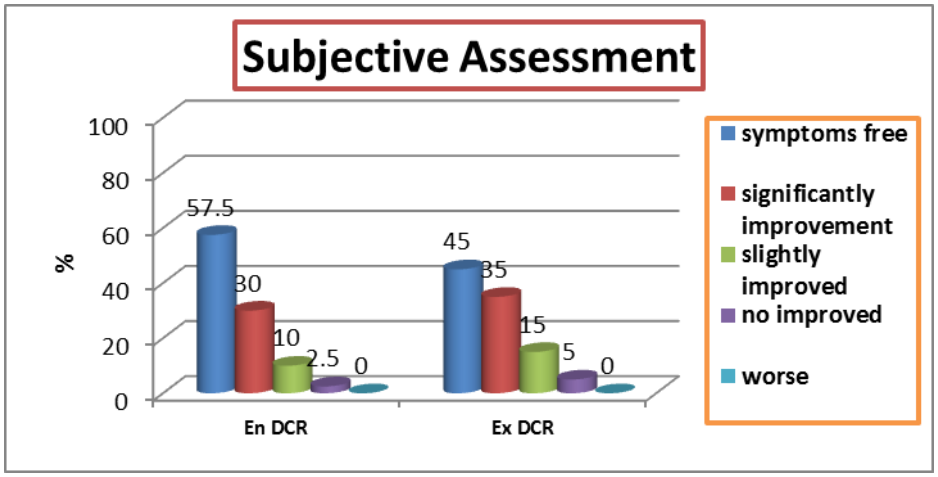

Fig (٣٥): Chart showing subjective outcome between endoscopic and ExDCR shows no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٣ months on the basis of subjective evaluation (p >٠.٠٥).

Table (٤): Showing comparison between subjective outcomes of ExDCR with endoscopic silione DCR

	Endoscopic silione DCR	ExDCR	P value
Subjective assessment: **Symptom free.** **Significantly improved.** **Slightly improved.** **No improved.** **Worse.**	 ١٦ (٨٠٪) ٢ (١٠٪) ٢ (١٠٪) ٠ (٠٪) ٠ (٠٪)	 ٩ (٤٥٪) ٧ (٣٥٪) ٣ (١٥٪) ١ (٥٪) ٠ (٠٪)	٠.١١٥
Fate: n (%) **Success:** **Failed.**	 ١٨ (٩٠٪) ٢ (١٠٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٣٧٦

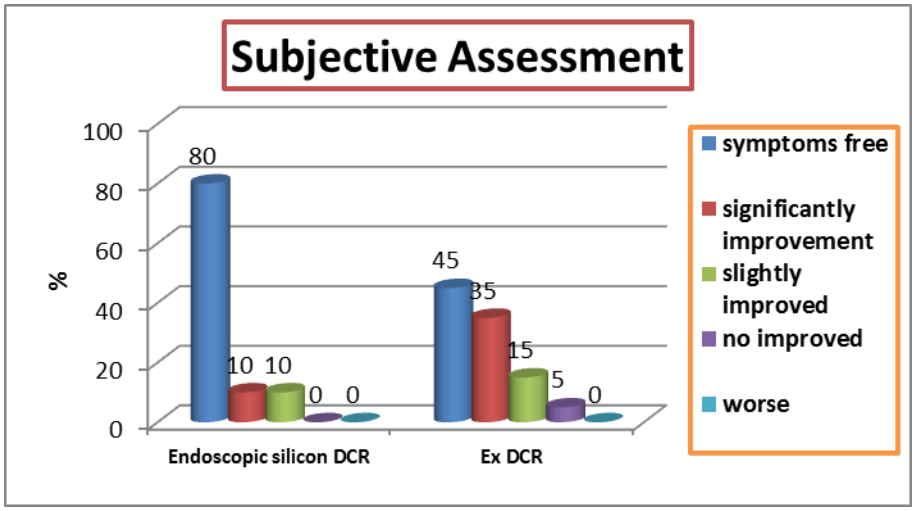

Fig (٣٦): Showing subjective assessment of En DCR with silione and Ex DCR at ٣ months

Table (٥): Showing comparison between subjective outcomes of ExDCR with endoscopic otologic T-tube DCR

Subjective assessment:	ExDCR	endoscopic otologic T-tube DCR	P value
Symptom free. **Significantly improved.** **Slightly improved.** **No improved.** **Worse.**	٩ (٤٥٪) ٧ (٣٥٪) ٣ (١٥٪) ١ (٥٪) ٠ (٠٪)	٧ (٣٥٪) ١٠ (٥٠٪) ٢ (١٠٪) ١ (٥٪) ٠ (٠٪)	٠.٨٠٦
Fate: n (%) **Success:** **Failed.**	١٦ (٨٠٪) ٤ (٢٠٪)	١٧ (٨٥٪) ٣ (١٥٪)	٠.٦٧٧

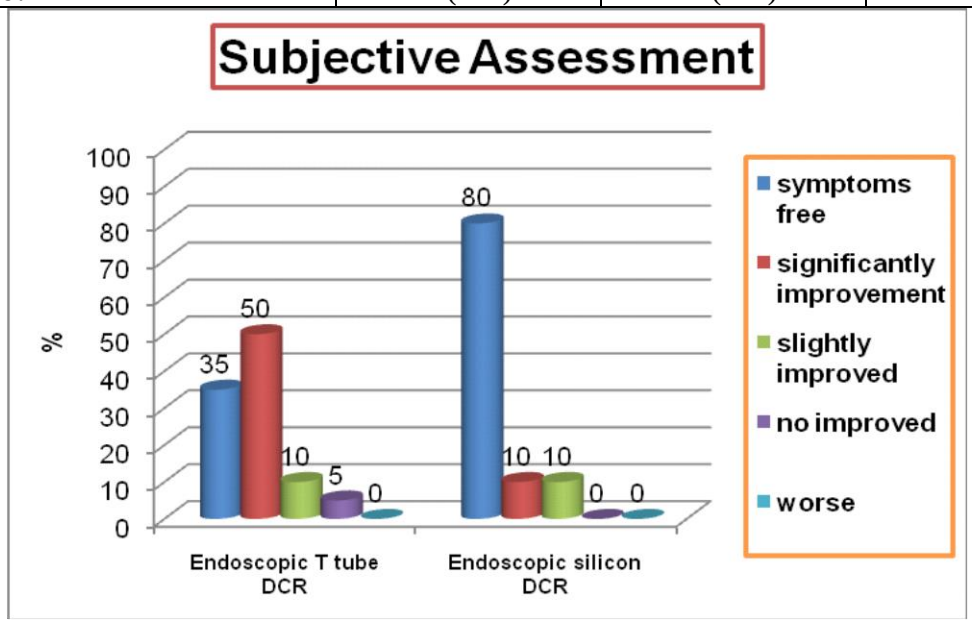

Fig (٣٨): There was no statistically significant difference between surgical outcomes of the ٢ surgical endoscopic groups at ٣ months on the basis of subjective evaluation (p >٠.٠٥).

Table (٦): Showing comparison between subjective outcomes of endoscopic silione DCR with endoscopic otologic T-tube DCR

	٣ month		
Subjective assessment:	**endoscopic silione DCR**	**Endoscopic otologic T-tube DCR**	**P value**
Symptom free. **Significantly improved.** **Slightly improved.** **No improved.** **Worse.**	١٦ (٨٠٪) ٢ (١٠٪) ٢ (١٠٪) ٠ (٠٪) ٠ (٠٪)	٧ (٣٥٪) ١٠ (٥٠٪) ٢ (١٠٪) ١ (٥٪) ٠ (٠٪)	٠.٠٢٠*
Fate: n (%) **Success:** **Failed.**	١٨ (٩٠٪) ٢ (١٠٪)	١٧ (٨٥٪) ٣ (١٥٪)	٠.٦٣٣

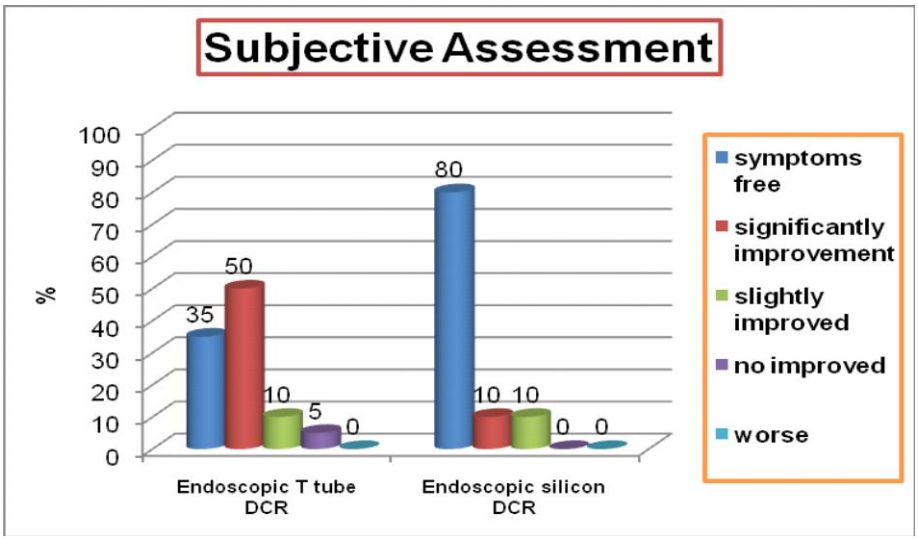

Fig (٣٨): There was no statistically significant difference between surgical outcomes of the ٢ surgical endoscopic groups at ٣ months on the basis of subjective evaluation (p >٠.٠٥).

Table (٧): showing objective assessment between External and EnDCR at ٣ months duration.

	EnDCR	ExDCR	P value
Florescence flow: n (%) **+ve flow:** **No flow.**	 ٣٥ (٨٧.٥٪) ٥ (١٢.٥٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٤٤٣
Granulations: n (%) **Present.** **Absent.**	 ١٢ (٣٠٪) ٢٨ (٧٠٪)	 ٧ (٣٥٪) ١٣ (٦٥٪)	٠.٦٩٥
Rhinostomy: n (%) **Visible:** **Invisible.**	 ٢٥ (٦٢.٥٪) ١٥ (٣٧.٥٪)	 ١١ (٥٥٪) ٩ (٤٥٪)	٠.٥٧٦
Synechia: n (%) **Present.** **Absent.**	 ١١ (٢٧.٥٪) ٢٩ (٧٢.٥٪)	 ٩ (٤٥٪) ١١ (٥٥٪)	٠.١٧٥

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٣ months regarding the objective assessment

Table (٨): Showing objective assessment between External and endoscopic silione DCR at ٣ months duration

Objective Assessment	Endoscpic silione group	ExDCR	P value
Florescence flow: n (%) **+ve flow:** **No flow.**	 ١٨ (٩٠٪) ٢ (١٠٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٣٧٦
Granulations: n (%) **Present.** **Absent.**	 ٩ (٤٥٪) ١١ (٥٥٪)	 ٧ (٣٥٪) ١٣ (٦٥٪)	٠.٥١٩
Rhinostomy: n (%) **Visible:** **Invisible.**	 ١٦ (٨٠٪) ٤ (٢٠٪)	 ١١ (٥٥٪) ٩ (٤٥٪)	٠.٠٩١
Synechia: n (%) **Present.** **Absent.**	 ٧ (٣٥٪) ١٣ (٦٥٪)	 ٩ (٤٥٪) ١١ (٥٥٪)	٠.٥١٩

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٣ months regarding the objective assessment

Table (٩): Showing objective assessment between External and endoscopic otologic T-tube DCR at ٣ months duration

Objective Assessment	ExDCR	Endoscopic otologic T-tube DCR	P value
Florescence flow: n (%)			
+ve flow:	١٦ (٨٠٪)	١٧ (٨٥٪)	٠.٦٧٧
No flow.	٤ (٢٠٪)	٣ (١٥٪)	
Granulations: n (%)			
Present.	٧ (٣٥٪)	٣ (١٥٪)	٠.١٤٤
Absent.	١٣ (٦٥٪)	١٧ (٨٥٪)	
Rhinostomy: n (%)			
Visible:	١١ (٥٥٪)	٩ (٤٥٪)	٠.٥٢٧
Invisible.	٩ (٤٥٪)	١١ (٥٥٪)	
Synechia: n (%)			
Present.	٩ (٤٥٪)	٤ (٢٠٪)	٠.٠٩١
Absent.	١١ (٥٥٪)	١٦ (٨٠٪)	

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٣ months regarding the objective assessment

Table (١٠): Showing objective assessment between endoscopic silione and endoscopic otologic T-tube DCR at ٣ months duration

objective assessment	Endoscopic silione DCR	Endoscopic otologic T-tube	P value
Florescence flow: n (%)			
+ve flow:	١٨ (٩٠٪)	١٧ (٨٥٪)	٠.٦٣٣
No flow.	٢ (١٠٪)	٣ (١٥٪)	
Granulations: n (%)			
Present.	٩ (٤٥٪)	٣ (١٥٪)	٠.٠٣٨*
Absent.	١١ (٥٥٪)	١٧ (٨٥٪)	
Rhinostomy: n (%)			
Visible:	١٦ (٨٠٪)	٩ (٤٥٪)	٠.٠٢٢*
Invisible.	٤ (٢٠٪)	١١ (٥٥٪)	
Synechia: n (%)			
Present.	٧ (٣٥٪)	٤ (٢٠٪)	٠.٢٨٨
Absent.	١٣ (٦٥٪)	١٦ (٨٠٪)	

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٣ months regarding the objective assessment except visibility of rhinostomy that shows statistically significant difference .

Table (١١): Showing subjective outcome between endoscopic and ExDCR

subjective assessment	EnDCR	ExDCR	P value
Symptom free.	٢٤ (٦٠٪)	٩ (٤٥٪)	
Significantly improved.	١٠ (٢٥٪)	٧ (٣٥٪)	
Slightly improved.	٥ (١٢.٥٪)	٣ (١٥٪)	٠.٣٩٢
No improved.	١ (٢.٥٪)	١ (٥٪)	
Worse.	٠ (٠٪)	٠ (٠٪)	
Fate: n (%)			
Success:	٣٤ (٨٥٪)	١٦ (٨٠٪)	٠.٦٢٤
Failed.	٦ (١٥٪)	٤ (٢٠٪)	

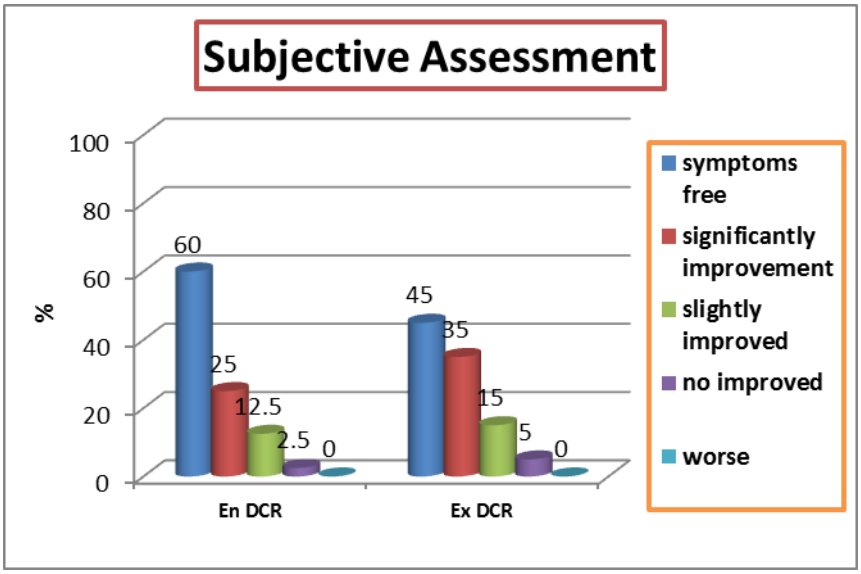

Fig (٣٩): Chart showing subjective outcome between endoscopic and ExDCR shows no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٦ months on the basis of subjective evaluation (p >٠.٠٥).

Table (١٢): showing comparison between subjective outcomes of ExDCR with endoscopic silione DCR

Subjective assessment:	Endoscopic silione DCR	ExDCR	P value
Symptom free. **Significantly improved.** **Slightly improved.** **No improved.** **Worse.**	١٦ (٨٠٪) ٢ (١٠٪) ٢ (١٠٪) ٠ (٠٪) ٠ (٠٪)	٩ (٤٥٪) ٧ (٣٥٪) ٣ (١٥٪) ١ (٥٪) ٠ (٠٪)	٠.١١٥
Fate: n (%) **Success:** **Failed.**	 ١٨ (٩٠٪) ٢ (١٠٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٣٧٦

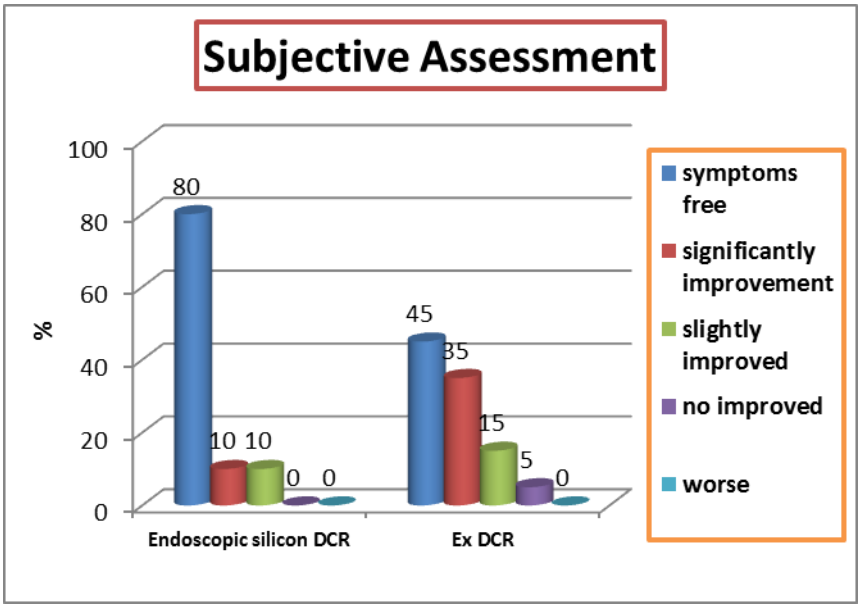

Fig (٤٠): Showing subjective assessment of En DCR with silione and Ex DCR at ٦ months

Table (١٣): Showing comparison between subjective outcomes of ExDCR with endoscopic otologic T-tube DCR

Subjective assessment:	ExDCR	endoscopic otologic T-tube DCR	P value
Symptom free.	٩ (٤٥٪)	٧ (٣٥٪)	٠.٩١٩
Significantly improved.	٧ (٣٥٪)	٩ (٤٥٪)	
Slightly improved.	٣ (١٥٪)	٣ (١٥٪)	
No improved.	١ (٥٪)	١ (٥٪)	
Worse.	٠ (٠٪)	٠ (٠٪)	
Fate: n (%)			
Success:	١٦ (٨٠٪)	١٦ (٨٠٪)	١.٠٠٠
Failed.	٤ (٢٠٪)	٤ (٢٠٪)	

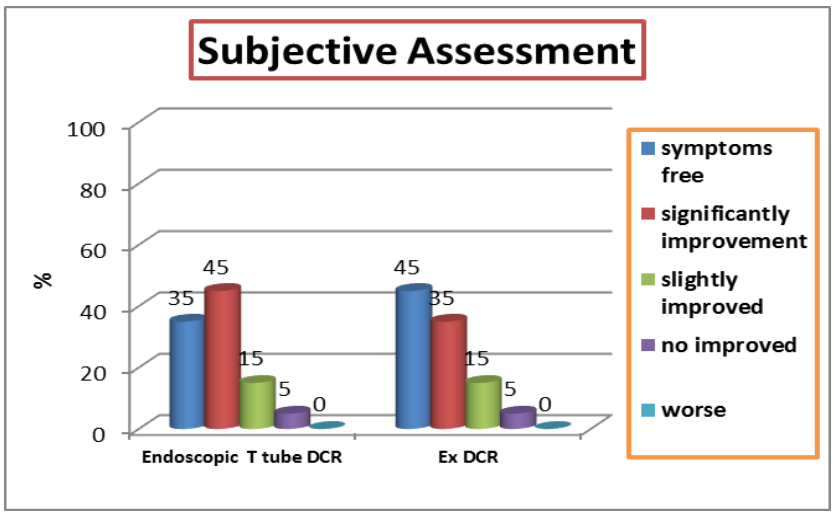

Fig (٤١): There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٦ months on the basis of subjective evaluation (p >٠.٠٥).

Table (١٤): showing comparison between subjective outcomes of endoscopic silione DCR with endoscopic otologic T-tube DCR

Subjective assessment:	endoscopic silione DCR	Endoscopic otologic T-tube DCR	P value
Symptom free.	١٦ (٨٠٪)	٧ (٣٥٪)	٠.٠٢٧*
Significantly improved.	٢ (١٠٪)	٩ (٤٥٪)	
Slightly improved.	٢ (١٠٪)	٣ (١٥٪)	
No improved.	٠ (٠٪)	١ (٥٪)	
Worse.	٠ (٠٪)	٠ (٠٪)	
Fate: n (%)			
Success:	١٨ (٩٠٪)	١٦ (٨٠٪)	٠.٣٧٦
Failed.	٢ (١٠٪)	٤ (٢٠٪)	

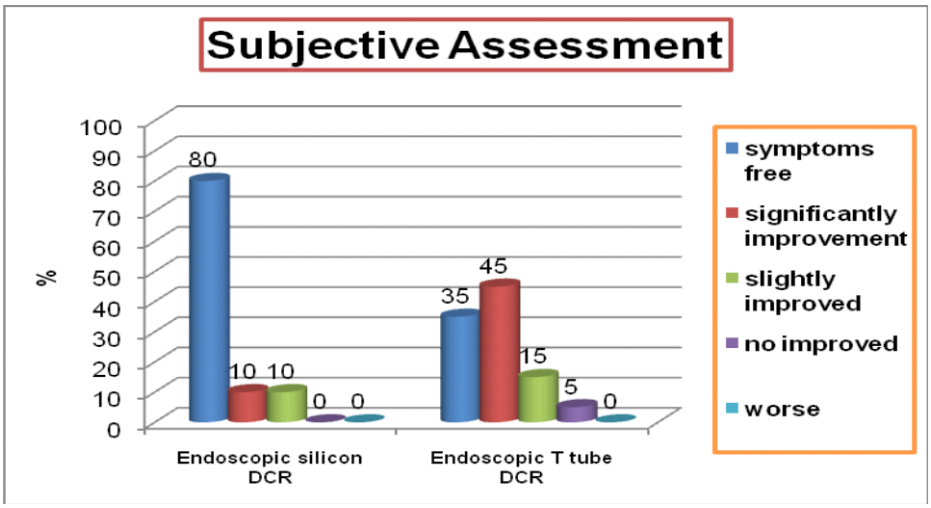

Fig (٤٢): There was no statistically significant difference between surgical outcomes of the ٢ surgical endoscopic groups at ٦ months on the basis of subjective evaluation (p >٠.٠٥).

Objective Assessment (at ٣ months)

Table (١٥): Showing objective assessment between External and EnDCR at ٦ months duration.

Objective Assessment	EnDCR	ExDCR	P value
Florescence flow: n (%) **+ve flow:** **No flow.**	 ٣٤ (٨٥٪) ٦ (١٥٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٦٢٤
Granulations: n (%) **Present.** **Absent.**	 ١٨ (٤٥٪) ٢٢ (٥٥٪)	 ١٠ (٥٠٪) ١٠ (٥٠٪)	٠.٧١٤
Rhinostomy: n (%) **Visible:** **Invisible.**	 ١٩ (٤٧.٥٪) ٢١ (٥٢.٥٪)	 ١٠ (٥٠٪) ١٠(٥٠٪)	٠.٨٥٥
Synechia: n (%) **Present.** **Absent.**	 ١٩ (٤٧.٥٪) ٢١ (٥٢.٥٪)	 ٩ (٤٥٪) ١١ (٥٥٪)	٠.٨٥٥

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٦ months regarding the objective assessment

Table (١٦): Showing objective assessment between External and endoscopic silione DCR at ٦ months duration

Objective Assessment	Endoscpic silione group	ExDCR	P value
Florescence flow: n (%) **+ve flow:** **No flow.**	 ١٨ (٩٠٪) ٢ (١٠٪)	 ١٦ (٨٠٪) ٤ (٢٠٪)	٠.٣٧٦
Granulations: n (%) **Present.** **Absent.**	 ١١ (٥٥٪) ٩ (٤٥٪)	 ١٠ (٥٠٪) ١٠ (٥٠٪)	٠.٧٢٥
Rhinostomy: n (%) **Visible:** **Invisible.**	 ١٣ (٦٥٪) ٧ (٣٥٪)	 ١٠ (٥٠٪) ١٠(٥٠٪)	٠.٣٣٧
Synechia: n (%) **Present.** **Absent.**	 ١١ (٥٥٪) ٩ (٤٥٪)	 ٩ (٤٥٪) ١١ (٥٥٪)	٠.٥٢٧

There was no statistically significant difference between surgical outcomes of the ٢ surgical

groups at ٦ months regarding the objective assessment

Table (١٧): Showing objective assessment between External and endoscopic otologic T-tube DCR at ٣ months duration

objective assessment	ExDCR	endoscopic otologic T-tube DCR	P value
Florescence flow: n (%)			
+ve flow:	١٦ (٨٠٪)	١٦ (٨٠٪)	١.٠٠٠
No flow.	٤ (٢٠٪)	٤ (٢٠٪)	
Granulations: n (%)			
Present.	١٠ (٥٠٪)	٧ (٣٥٪)	٠.٣٣٧
Absent.	١٠ (٥٠٪)	١٣ (٦٥٪)	
Rhinostomy: n (%)			
Visible:	١٠ (٥٠٪)	٦ (٣٠٪)	٠.١٩٧
Invisible.	١٠ (٥٠٪)	١٤ (٧٠٪)	
Synechia: n (%)			
Present.	٩ (٤٥٪)	٨ (٤٠٪)	٠.٧٤٩
Absent.	١١ (٥٥٪)	١٢ (٦٠٪)	

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٦ months regarding the objective assessment

Table (١٨): Showing objective assessment between endoscopic silione and endoscopic otologic T-tube DCR at ٦ months duration

objective assessment	Endoscopic silione DCR	Endoscopic otologic T-tube	P value
Florescence flow: n (%)			
+ve flow:	١٨ (٩٠٪)	١٦ (٨٠٪)	٠.٣٧٦
No flow.	٢ (١٠٪)	٤ (٢٠٪)	
Granulations: n (%)			
Present.	١١ (٥٥٪)	٧ (٣٥٪)	٠.٢٠٤
Absent.	٩ (٤٥٪)	١٣ (٦٥٪)	
Rhinostomy: n (%)			
Visible:	١٣ (٦٥٪)	٦ (٣٠٪)	٠.٠٢٧*
Invisible.	٧ (٣٥٪)	١٤ (٧٠٪)	
Synechia: n (%)			
Present.	١١ (٥٥٪)	٨ (٤٠٪)	٠.٣٤٢
Absent.	٩ (٤٥٪)	١٢ (٦٠٪)	

There was no statistically significant difference between surgical outcomes of the ٢ surgical groups at ٦ months regarding the objective assessment except visibility of rhinostomy that shows statistically significant difference.

Table (١٩): Regarding septoplasty there is a signigicant difference between successes rate in patient underwent septoplasty and patients do not.

Fate of the operation	Septoplasty		P value
	Yes (٢٤)	No (٦)	
Success	٢٢ (٩١.٧٪)	٢ (٣٣.٣)	٠.٠٠١*
failed	٢ (٨.٣٪)	٤ (٦٦.٧)	

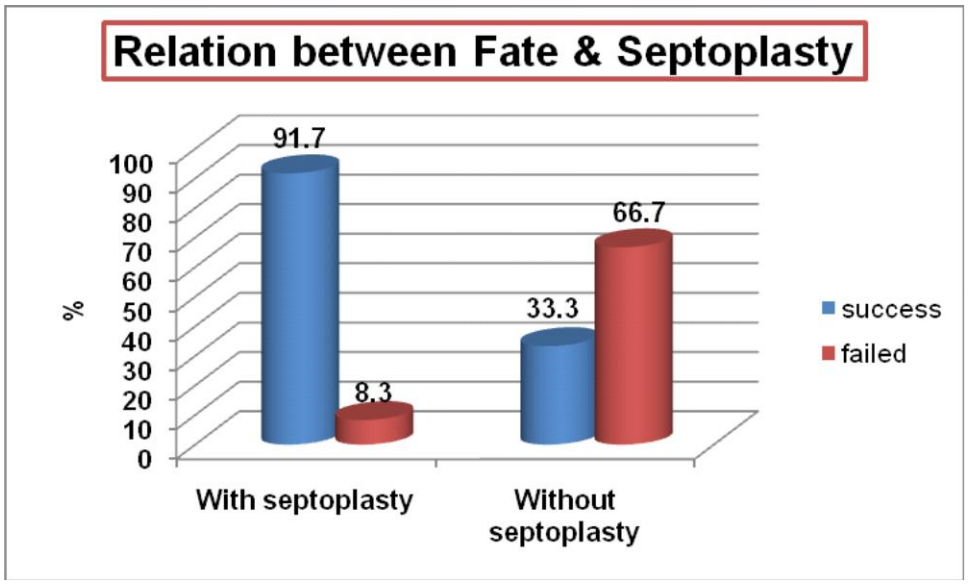

Fig (٤٣): Showing relation of septoplasty and fate of the operation

Intra operative complication of external and EnDCR:

Table (٢٠): Showing intraoperative complication of external and EnDCR

Intra operative complication	ExDCR		EnDCR		P-value
	NO	%	NO	%	
Moderate bleeding	٧	٣٥٪	١٢	٣٠٪	٠.٦٩٥
Severe bleeding	٣	١٥٪	١	٥٪	٠.٠٦٧
Trauma of the middle turbinate	٢	١٠٪	٤	١٠٪	١.٠٠٠
Accidental entry into anterior ethmoidal air cells	٢	١٠٪	١	٢.٥٪	٠.٢٠٩
Laceration of punctum	-	-	-	-	-

Post operative complication of external and EnDCR:

Table (٢١): Post operative complication of external and EnDCR

Post operative complication	ExDCR		Endoscopic DCR		P-value
	NO	%	NO	%	
Epistaxis	١	٥٪	-	-	٠.١٥٤
Wound infection	-	-	-	-	-
Obstruction at rhinostomy site	٤	٢٠٪	٦	١٥٪	٠.٦٢٤
Synechiae	٩	٤٥٪	١٩	٤٧.٥٪	٠.٨٥٥
Granulations	١٠	٥٠٪	١٨	٤٥٪	٠.٧١٤

Post operative patency rates:
The lacrimal drainage system was patent in ٣٤ patients (٨٥٪) in Endoscopic DCR and patent in ١٦ patients (٨٠٪) in ExDCR at the end of ٦ months, hence the success rate was ٨٥٪ E

Discussion

Epiphora is an annoying symptom, embracing the patient both socially and functionally (Cokkeser et al, ٢٠٠٣)

The definitive treatment for most of lacrimal system disorders is surgical (Watkins et al., ٢٠٠٣)

DCR, which has been performed for the past hundred years, is a surgical procedure by which lacrimal flow is diverted into the nasal cavity through an artificial Extern ling made at the level of the lacrimal sac. The operation can be carried out using either an external or endoscopic trans nasal surgical approach (Watkins et al., ٢٠٠٣).

ExDCR, originally described by Toti in ١٩٠٤ has a successful rate, when performed by properly trained ophthalmologists, of about ٩٠٪ (Feretis, et al., ٢٠٠٩; Yigit, et al., ٢٠٠٧). EnDCR was described prior to this, in ١٨٩٣ by Caldwell, but poor equipment and subsequent good results from the external approach led it to being abandoned. McDonogh and Meiring were the first modern surgeons credited with introducing EnDCR in the late ١٩٨٠s (McDonogh and Meiring, ١٩٨٩). EnDCR has a success rate of ٨٣-٩٤٪ (Smirnov, et al., ٢٠٠٨), and has been demonstrated to offer similar outcomes when compared to ExDCR, with low complication rates (Feretis, et al ٢٠٠٩; Yigit, et al., ٢٠٠٧). EnDCR is a good option for the treatment of primary nasolacrimal duct obstruction but it is also considered an acceptable procedure for the treatment of failure of ExDCR (Demarco et al., ٢٠٠٧). EnDCR has been gaining popularity, largely due to technological advances in endoscopes and other modern instruments of rhinologic surgery (Watkins et al., ٢٠٠٣).

In order to evaluate the endoscopic procedure versus the external surgical approach sixty patients with primary nasolacrimal duct obstruction were enrolled from Minia University ENT department and ophthalmology department.

In this study the age of the patients ranges from ١٦-٦٤y and this correlate with Kuldeep et al, ٢٠١١ where the age of the patients ranged for ١٦-٦٨y

The female sex was more predominant than males accounting ٨٢٪ Vs ١٨% respectively. This came in correlation with results of Kuldeep et al, ٢٠١١ who found that ٨٠٪ of the patients were females and ٢٠٪ were males. The striking predilection for females can be explained by the narrower lumen of the bony nasolacrimal canal. It is also possible that endocrine factors may be playing a role in the etiology of chronic dacryocystitis.

Successful EnDCR appears to be dependent on several important factors: (١) a thorough understanding of the endoscopic anatomy and location of the lacrimal sac, (٢) complete removal of the frontal process of the maxilla to expose the medial wall of the lacrimal sac, and (٣) precise Externaling of the lacrimal sac to achieve adequate exposure of the common internal punctum (Mansour et al., ٢٠٠٦).

Another important key factor to success in EnDCR is the indication. Transnasal endoscopic approach to the lacrimal system obstruction is indicated mainly in patients with postsaccal obstruction (Mannor and Millman, ١٩٩٢).

The success rate in the present study is ٨٧.٥٪ in EnDCR Vs ٨٠ % in the ExDCR at ٣ months and ٨٥٪ in in ExDCR Vs ٨٠ % in the ExDCR at ٦ months and this correlate with Cokkeser et al, ٢٠٠٣ who found success rate of about ٨٧٪ with EnDCR. There was no statistically significant difference between these success rates. Dolman (٢٠٠٣) found no statistically significant differences in the outcome between EnDCR and ExDCR.

The success rate of the EnDCR with silione is ٩٠٪ vs ٨٠٪ success rate of the ExDCR and this correlate with Vijay et al, ٢٠٠٧ that reported ٩٣٪ success rate for the EnDCR with silione intubation.The use of silionee

stents is considered routine in many institutions (Yigit et al., ٢٠٠٧). Although controversial, silionee stents are used to keep the neo-ostium External after the procedure and are thought to maintain the patency of the ostium by preventing circular stenosis of the neo-ostium in the post-operative healing period. Prolonged silionee intubation adds to the risk of granulation tissue formation at the neo-ostium, and has been described as a cause of failure (Onceri et al., ٢٠٠٠). There is no general agreement regarding the duration of the stenting. Recommendations range from ٤ weeks to ٣ months. Kim et al, ٢٠٠٧ also Linberg et al, ١٩٨٢ recommended the policy to remove the tubes at ١٢ weeks. They believed that rhinostomy patent at ١٢ weeks stay patent, Whittet et al ١٩٩٣ recommend removal of the tubes at ٣ months and lastly Metin et al, ٢٠٠٠ considered that long intubation period was one of the causes of DCR failure and said that the tubes should not be left for more than ٣ months and this correlates with our study as the duration of stenting either for ExDCR or EnDCR was ٣months.

The success rate of the EnDCR using otologic T-tube was ٨٥٪ at ٣ months and ٨٠٪ at ٦ months follow up while ExDCR showed ٨٠٪ success rate and this show no statistically significant difference between the ٢ groups and this correlate with Tamura et al, ٢٠٠٣ that show success rate ٨٦٪ for EnDCR with the otologic T-tube and the success rate for EnDCR using otologic T-tube is higher than the success rate of Kishore and McGarry (٢٠٠١) reported success rate ٧٣٪ and this decline in the success rate was due to spontaneous loss of the otologic T-tube and this was avoided in the current study by warning the patient not to blow the nose forcibly and prescription of medication that inhibit sneezing.

It was observed that EnDCR toke less time (mean duration = ٣٩.٧٥m) as compared to ExDCR (mean duration = ٥٢.٥m), which was statistically significant (P =٠.٠٠٢), as the duration of surgery was shorter in EnDCR and this correlates with Hurwitz (١٩٩٦) who reported ٣٨ min. for EnDCR and with Kuldeep et al., (٢٠١١) and Vivek et al., (٢٠١٣) as the mean duration for EnDCR is ٤٥ min. and for ExDCR is ٧٥ min.

Postoperative care is considered a crucial factor for the success of DCR. However, general quide lines for adequate post-operative treatment do not exist and therefore practices vary widely. The postoperative administration of systemic antibiotics and intranasal steroid spray have been recommended. Cleaning the rhino-stomy site ١ week after surgery, local irrigation of the nasal cavity with saline spray and antibiotic-steroid eye drops for ٢ weeks postoperatively. It is well founded that the success of surgery may be established at ٦ months after the operation (Smirnov et al., ٢٠٠٨). In this study similar guidelines were undertaken postoperative and follow up periods ranged from ٦ months to ١ year.

In the current study, it was found that bleeding was the most common Intra operative complication (٥٠٪) in the ExDCR and ٣٥٪ in the EnDCR and this correlate with Kuldeep et al., (٢٠١١) that was found bleeding was the most common Intra operative complication (٤٥٪) in thee ExDCR and ٤٥٪ in the EnDCR.

In the current study it was observed that no major postoperative complication. epistaxis after surgery as reported as ٥٪ of cases in ExDCR and this correlate with Fatih Qghan and Fatih Ozcura, ٢٠٠٨.

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