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Endonasal Dacryocystorhinostomy, About 52 Cases

Maha Hakimi (ENT - Neck and Head surgery Department; University medical center Mohammed VI. Marrakech)
Benhoummad Othmane (ENT- Neck and Head surgery Department; University medical center Mohammed VI. Marrakech)
Youssef Rochdi (ENT - Neck and Head surgery Department; University medical center Mohammed VI. Marrakech)
Abdelaziz Raji (ENT - Neck and Head surgery Department; University medical center Mohammed VI. Marrakech)

Abstract:-

Introduction: Dacryocystorhinostomy is the procedure that marsupializes the lacrimal sac into the ipsilateral nasal cavity. This rather simple and biased definition does not summarize the rather tremendous difficulty for the surgeon to decide on the most effective surgical route to carry it out. Two surgical techniques then merge together, endonasal Dacryocystorhinostomy, a prerogative of the ENT doctor, and external Dacryocystorhinostomy, preferred by ophthalmologists. The aim of our study was therefore mainly to answer this still relevant question: Dacryocystorhinostomy by endonasal route versus by external route, when? and why?

Cases: It is for this purpose that we have collected 52 cases of Dacryocystorhinostomy operated by endonasal route in the ENT department of the University hospital of Mohamed VI in the city of Marrakech in Morocco, these patients were seen over a period of 5 years, from January 2013 to January 2018; we thus included all the patients presenting with chronic lacrimation, a permeable lacrimal sac judged by a positive bone contact and having undergone exclusive endonasal surgery.

Results/Discussion: Our ultimate goal was, of course, to demonstrate the functional and anatomical superiority of the endonasal route, in the end it is quite correct to say that it is a surgical technique which, unlike its counterpart, lends itself quite readily to the ambulatory surgery under local anesthesia, but not only, the endonasal route is a surgery with little or no bleeding, requiring a short recovery period and minimal morbidity. It is also fairly localized with very little collateral damage. It is also very aesthetic for patients since it is endonasal and does not require a facial scar, which is quite embarrassing for the patient. This is not all, since this approach allows the treatment of a coexisting nasal sinus pathology and the correction of anatomical nasal sinus obstacles often responsible of failures of external dacryocystorhinostomy. Despite its innumerable advantages, it would be fair to enumerate its disadvantages, although few in number, such as difficulty in locating the inside of the lacrimal sac and the common orifice or the fragility of the lacrimal mucosa which can be injured, resulting in stenosis.

Conclusion: Endonasal dacryocystorhinostomy should be a first-line surgical intervention, and not just, as some consider it, a technique for surgical revision of a failure of external dacryocystorhinostomy.

Keywords:- *Dacryocystorhinostomy, Lacrymo-Nasal Duct,Middle Turbinate*.

I. INTRODUCTION

Dacryocystorhinostomy is the procedure that marsupializes the lacrimal sac into the ipsilateral nasal cavity. This rather simple and biased definition does not summarize the rather tremendous difficulty for the surgeon to decide on the most effective surgical route to carry it out. Two surgical techniques then merge together, endonasal Dacryocystorhinostomy, a prerogative of the ENT doctor, and external Dacryocystorhinostomy, preferred by ophthalmologists. At the end of the 19th century, Caldwell was the first to take an interest in endonasal dacryocystorhinostomy. However, the optical guiding means being insufficient, this route was abandoned for nearly a century, only to experience renewed interest in the 1980s with the advent of endonasal surgery under microscopic and endoscopic guidance. It was Rouvier in 1981 in France who revived interest in dacryocystorhinostomy by endonasal route. Its excellent results, the absence of skin scars and its lower morbidity make it a strong contender against the external route. The aim of our study was therefore mainly to answer this still relevant question: Dacryocystorhinostomy by endonasal route versus by external route, when? and why?

II. CASES

It is for this purpose that we have collected 52 cases of Dacryocystorhinostomy operated by endonasal route in the ENT department of the University hospital of Mohamed VI in the city of Marrakech in Morocco, these patients were seen over a period of 5 years, from January 2013 to January 2018; we thus included all the patients presenting with chronic lacrimation, a permeable lacrimal sac judged by a positive bone contact and having undergone exclusive endonasal surgery. All our patients underwent an ENT examination which aimed to find a local cause of the chronic tearing and to assess the possible operating difficulties, an examination of the nasal cavity and an ophthalmologic examination. We performed in all our patients an endonasal dacryocystorhinostomy after transillumination by the tear canaliculi and placement of a bicanaliculonasale probe.

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III. RESULTS

We therefore brought together 52 patients operated on for Endonasal; showing a clear female predominance (60%) or a sex ratio of 0.66, the average age was 38.5 years old which was rather young, with the age group of 30-40 years predominantly affected. It was essential for us to determine the ENT and ophthalmological history of the patients, which in the end result found 18 cases of isolated dacryocystitis, 7 cases of dacryocystitis associated with allergic rhinitis, 4 cases of isolated allergic rhinitis, 3 cases of facial trauma, 3 cases of family history of dacryocystitis and no special history in 17 patients. It is important to note that no patient has had tear surgery or endonasal surgery.

The main symptom of this pathology, constant in all our patients, was chronic lacrimation. This lacrimation was clear in 57.5% of the patients; and purulent in 42.5% of patients. Followed by swelling of the anterointernal angle of the eye in 30% of patients. The side most frequently affected was the left side in 55% of cases. Without any bilateral impairment case noted. The thorough questioning associated with a complete clinical examination was required in all of our patients, and in 3 patients we found an aspect of localized cellulitis in pre-fistulisation (Figure 1) . Ophthalmologic examination was performed in all patients. It systematically recorded data on: visual acuity, condition of the eyeball and a slit lamp examination. Bone contact was systematically investigated in all patients and was positive in all cases.

The rhinoscopy, given the proposed approach, was systematic, with a rigid 30 ° optic, with the aim of looking for a local cause of the lacrimation and to eliminate the existence of architectural anomaly that could be at the origin of surgical difficulties, or to look for an infection that could postpone the surgical intervention and also allowed a preliminary study of the various landmarks of the region of the middle meatus with a systematic verification of the state of the cavum which was found to be free in all patients. We found in the end: 19 cases of narrow nasal cavity, 18 cases of wide nasal cavity and 15 cases of septal deviation with a wide nasal cavity. None of our patients benefited from a CT scan for there was no indication.

The management of these patients can be broadly subdivided into different parts: the medical treatment first, systematic and compulsory, then the surgical part. Medical treatment consisted of instillation of artificial tear in all patients; and local antibiotic therapy, based on gentamicin gout, in patients with acute dacryocystitis, meaning 18 patients. Patients with allergic rhinitis have also benefited from treatment with topical nasal corticosteroid therapy. 3 patients received antibiotic therapy, based on quinolones and corticosteroid therapy. They presented signs of localized cellulitis in pre-fistulisation with the release of purulent fluid under pressure from the canthal region. After explaining to patients, the risks of endonasal surgery, informed consent was given before any surgery. The tear field was identified with a rigid endoscope (0 ° and 30 ° optics) after dislocation inside the middle turbinate. This identification was greatly facilitated by the transillumination of the tear sac(Figure 2) using a 0.9mm diameter optical fiber introduced through the lower tear point. After identification, the procedure consisted in all our patients in three operative stages, successive and succinctly the mucous stage, the bone stage and finally the lacrimal one. The mucous phase included detachment of the mucosa from the bone plane and its removal, the bone phase followed, with an excision of the bony wall of the lacrimal groove, thus after milling, the internal wall of the lacrimal sac is exposed and the upper wall of the nasal lacrimal duct. And finally, the lacrimal step, with opening of the tear sac and calibration using a two-channel probe that will be tied. All of our patients benefited from number 8 nasal plugs.

The post-operative follow-up in our patients were for the most part without particular incidents, although we noted 4 cases of localized emphysema of the lower eyelid and 3 cases of periorbital ecchymosis, in sum complications that are to be expected in the context of this type of surgery. All our patients have benefited from a systemic antibiotic therapy at a rate of 3 g / day associated with an analgesic treatment containing paracetamol at a rate of 3 g / day. Local treatment based on ocular instillation was also systematic in all our patients (gentamycin). Local care of the nasal cavity using saline serum or sea water spray has been systematic. Local ocular treatment with artificial tears throughout the tear calibration was maintained. The stripping of the nasal plugs was carried out 48 hours after the procedure in all of our patients, with no case requiring lengthening or shortening the duration of the stripping.

The mean hospital stay was 51.6 hours, with a discharge after 48 hours postoperatively in 45 patients, after 72 hours in 7 patients. The 3 patients who presented with an eyelid ecchymosis were kept in hospital for 4 days. Their discharge was carried out after endoscopic verification and ophthalmological examination. The tube was removed in the 6th month postoperatively in all patients. The evaluation of our postoperative results was based on two criteria, First and foremost functional criteria, the very purpose of the surgery for the patient is their eye complaints, so has our surgery been beneficial for the function of the patients? The answer is yes since 80% of our patients noted the total disappearance of the original symptomatology, against 10% of patients with a return of the initial symptomatology and the rest of the 10% finding rather thick intermittent tearing. The local endoscopic result is also essential and would be the second criteria, we thus found 92.5% of permeable stoma, that is to say a satisfactory result and only 7.5% of closed stoma. Although rare, the complications that were observed during the examination of our patients were: One case of synechiae between the nasal septum and the middle turbinate, one case of granuloma and 2 cases of ipsilateral crusted rhinitis. Endonasal revision surgery was performed in two patients who presented with o synechiae and granuloma. The other two patients underwent external Dacryocystorhinostomy.

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Figure 1: Young girl with acute dacryocystitis

Figure 2: The light spot of transillumination, allowing to locate tear sac

IV. DISCUSSION

The low acquired obstruction of the lacrimal passages at the level of the lacrymo-nasal duct is at the origin of a functionally incapacitating chronic epiphora and / or episodes of acute dacryocystitis by bacterial superinfection. The only therapeutic solution is the surgical restoration of the patency of the tear ducts. [1] Developed in 1904 by Toti, the external Dacryocystorhinostomy was a figurehead for the treatment of this obstruction and was widely acclaimed by ophthalmologists. [2] The endonasal approach described, as early as 1893, was abandoned because of the surgical risks incurred due to insufficiently efficient instrumentation and optical means. Surgery under a microscope, in the 1980s [3], then optic surgery in the 1990s, made this endonasal approach to the tear sac a safer, simpler, more atraumatic, if not more efficient technique. This is what the experience of our service tries to prove, the superiority of this endonasal approach, abandoned for too long.

Beyond this surgical data, our study also takes stock of the epidemiological and clinical data of this pathology. Thus, we noted, like the literature, a clear predominance of women in the affected cases, with a sex ratio of 0.66; this is easily explained by the dimensions of the bony lacrimal-nasal duct that are smaller in women than in men, as demonstrated by Groessel [4] He postulated that a narrower, more angulated bony duct with an oval superior orifice, could partly explain the higher frequency of stenosis of the lacrimal-nasal duct in women. But not only that, the use of the wrong cosmetics applied to the wrong side of the eyelashes can play an important role in the obstruction of the lacrimal-nasal system leading to an epiphora [5]. Dalgleish [6] reported in a population of 109 patients presented with lacrimal-nasal duct stenosis that it was directly proportional to age and that 35-40 years was the age group most affected. These figures are consistent with those of our series. For A. Ducasse [6], as is the case in our series, the main symptom found was chronic lacrimation, whether or not complicated by dacryocystitis; Recurrent conjunctivitis resistant to any treatment were also described [4-5], as well as palpebral eczema. Alterations of the lacrimal mucosa can cause an impression of mass in the region of the lacrimal sac, even in the absence of a real tumor or of a purulent collection. The predominance in the left eye of our study is also consistent with the results of the literature although this question is still not well elucidated.

Tearing is the main clinical symptom of this pathology although it may be absent in the presence of lacrimal hyposecretion. It is sometimes accompanied by a chronic conjunctivitis called "lacrimal" due to the stasis of tears. Secondary, infections can occur episodically or be almost permanent with purulent mucocele. [7] The clinical examination must be as complete and thorough as possible, starting with an interrogation in search of the duration of the symptomatology, but also of the medical and surgical history of the patient in search in particular of past endonasal or sinus surgery or a facial trauma that can cause an obstacle to the flow of tears in the lacrimal passages. The ophthalmological examination, the centerpiece of the clinical examination, is also essential and makes it possible to measure the visual acuity, eye pressure by the slit lamp examination which studies the anterior segment of the eye, it also permits to analyze the tear film, the existence and appearance of tear points. It also permits the examination of: the condition of the eyelids, the condition of the conjunctiva and the caruncle and the corneal condition. A tear duct probing, using a BOWMAN "00" probe inserted into the inferior canaliculus, looks for contact between the probe and the inner wall of the lacrimal sac which sits against the periosteum; this is called bone contact, its positivity eliminates stenosis upstream of the lacrimal sac, which is the case in our study where positive bone contact was an inclusion criterion. Of course, a complete ENT examination follows, the aim of which is to find a local cause, either sinusitis or allergic rhinitis, and above all to assess the operational difficulties: a septal deviation, a narrow nasal cavity or a concha bullosa. In the preoperative assessment, the examination is carried out on the roof of the nasal cavity and on the middle meatus, with the location, from front to back, of the head of the middle turbinate, of the unciform process, ethmoidal bubble and retrobulbar groove. We try to visualize mainly the area above the insertion of the middle turbinate. Because that's where the tear sac usually projects. Certain clinical circumstances require the performance of additional examinations which are not carried out systematically: dacryocystography, dacryoscanner, magnetic resonance imaging, ultrasound or scintigraphy of the lacrimal passages. In our series none of our patients used it, the diagnosis was clear.

Before studying the surgical techniques, determining the goal of treatment is essential, this goal being to re-waterproof the lacrimal passages by achieving a permanent communication between the lacrimal sac and the nasal cavity, through which the tears will flow more freely. The question, therefore remains, external or endonasal approach? that is the question. Although there are other much less common surgical techniques such as: laser, retro-caroncular or trans canalicular dacryocystorhinostomy. Medical treatment, of course, does not remove the obstacle, but for most authors remains an essential adjunction in some patients.

Endonasal dacryocystorhinostomy can be performed under general or local anesthesia with a complementary injection of Xylocaine adrenaline into the middle turbinate and into the nasal mucosa of the lateral wall of the nose at the surgical site under endoscopic control. The first operative step, as previously explained, is the identification of the surgical area. Anatomically, the union canaliculus is implanted in the posterior and upper part of the lacrimal sac. If an optical fiber is introduced through a canaliculus until it comes into contact with bone, Trans illumination can detect the dome of the tear sac. One method of spotting is the Trans-illumination of the union channel. From transillumination, the osteotomy can be safely widened forward and downward. Once the identification is done, it is the mucous phase that follows, it is then that a rectangular mucoperiosteal flap is cut, and resected in its entirety. Flaps of nasal and lacrimal mucosa are sacrificed to decrease the risk of secondary stenosis. However, some authors retain the two flaps, which they secure with glue or neurosurgical clips. Finally, others sacrifice only the flap of nasal mucosa, and fold back the flap of lacrimal mucosa. The Bone phase is the next step: partial turbinectomy is not systematic, it is only performed if the middle turbinate is close to the osteotomy because the risk of synechia is high due to the large variability in the turbinate volume [9].The procedure usually involves removal of the anterior part of the uniform to give access to the posterior edge of the frontal process of the maxilla and opens the anterior ethmoidal cells. It also allows you to quickly and almost constantly locate the tear sac. The osteotomy is continued until the medial aspect of the tear sac and the upper part of the tear duct are free. Finally, it is the tear phase that closes the gesture, the medial wall of the duct sac is medialized with probe or forceps. The duct sac is opened with micro scissors, passing to the edges of the osteotomy. (9). A very large lacrimal sac is formed by shreds of nasal mucosa, to minimize the closure of the neostium. This technique has given satisfactory results and a higher success rate than the conventional method [10] Two types of interposition material must be distinguished: Equipment for calibrating the lacrimal passage: this is most often a bicanaliculonasale probe or a silicone blade which can be placed in the nasal cavity in order to avoid postoperative synechiae. And material for filling the nasal cavities: several materials, which may or may not be absorbable, have been used (gas wicks, silicone tubes and others). The essential objective of this filling is to prevent post-operative bleeding. For some authors their use is not systematic, and must be reserved for situations of hemorrhagic risk [9] because of the added trauma. These traumas are directly involved in the genesis of the synechiae and granulomas responsible for recurrence of tearing.

Postoperative treatment includes instillation of eye drops combining antibiotics and steroids. The nasal cavity is washed with physiological serum. This washing is followed by spraying combining vasoconstrictors and local disinfectants. Routine oral antibiotic therapy is not necessary. Postoperative endoscopic control of the nasal cavity is performed on the 15th day and on the 2nd month postoperatively.

Although rare, complications to this surgical technique exist and include the risk of initial bleeding i which is either due to small intraoperative bleeds that remain troublesome only for visibility during surgery and can be uncomfortable for the patient operated on under local anesthesia. Bleeding suggests injury to the anterior ethmoidal artery or one of its branches. We can also find complications related to spotting the surgical region, and this despite the trans illumination which can be faulted by ethmoidal hypertrophies or when the operculum of the middle turbinate is located below and in front. More rarely ethmoidal, frontal or maxillary sinusitis may be due to the anterior unciformectomy. A vigorously enlarged osteotomy towards the rear may invade the papery lamina of the ethmoid. Most often it is complicated by a simple eyelid bruise [10] indicating a minor vascular injury. The rupture of the papery lamina should be recognized as a warning sign because it opens the door to more serious intra-orbital complications. Care should also be taken to remove only the medial surface of the lacrimal sac and not its two walls with its periosteal envelope. This would put the lacrimal space in direct contact with the nasal cavity. This excessive ablation is a prelude to aesthetic complications such as fistulas.

Our ultimate goal was, of course, to demonstrate the functional and anatomical superiority of the endonasal route, in the end it is quite correct to say that it is a surgical technique which, unlike its counterpart, lends itself quite readily to the ambulatory surgery under local anesthesia, but not only, the endonasal route is a surgery with little or no bleeding, requiring a short recovery period and minimal morbidity [11] It is also fairly localized with very little collateral damage. It is also very aesthetic for patients since it is endonasal and does not require a facial scar, which is quite embarrassing for the patient. This is not all, since this approach allows the treatment of a coexisting nasal sinus pathology and the correction of anatomical nasal sinus obstacles often responsible of failures of external dacryocystorhinostomy [11] Despite its innumerable advantages, it would be fair to enumerate its disadvantages, although few in number, such as difficulty in locating the inside of the lacrimal sac and the common orifice or the fragility of the lacrimal mucosa which can be injured, resulting in stenosis.

As previously noted, the success of this operation, whatever the approach, can be judged on two criteria: first of all functional criteria, allowing it to be subdivided into 3 stages: good with disappearance of the pre-existing symptomatology, moderate with clinical improvement but

persistence of tearing and finally poor with a resumption of the pre-existing symptoms. There is a Munk score used to assess functional criteria based on the presence or absence of postoperative tearing, as well as its frequency [12] But also many functional tests such as the dye test or the secondary Jones test, or the fluorescein disappearance test. The functional failure of the endonasal route can be schematically subdivided into 3 categories: First, interparietal synechia encompassing the ostium and a facing wall, whether it is the nasal septum or the middle turbinate. It is the prerogative of narrow nasal cavities that cannot be enlarged or which have not been widened enough, then the sump syndrome defined by the persistence of a mucous bag unmasks when pressure is exerted on the canthal region and finally the Total healing of the nasal mucosa in this case no ostium is visible or in the form of a stellate fibrous scar. The second criterion of success is anatomical since among the most frequent causes of therapeutic failure we find in the majority of cases the persistence of a bony promontory in front of a variable part of the lacrimal sac. This gap between the rest of the sac and the osteotomy is particularly well demonstrated when the lacrimal sac is clouded. [12]

Numerous studies have aimed to demonstrate the superiority of one approach over the other, it is today unchangeable to say that the two routes seem quite close in their results either functional or anatomical, which is consistent with our results that showed a success rate of 82.5% in our patients all operated by endonasal route. Other teams have compared their own dacryocystorhinostomy, the results obtained were generally in favor of the external approach such as Sadiq et al. (1996) [13] (81% for the external route vs. 70% for the endonasal route) or Dolman (2003) [14] (90% for the external route vs. 90% for the endonasal route) where the results were equivalent.

V. CONCLUSION

Endonasal dacryocystorhinostomy should be a first-line surgical intervention, and not just, as some consider it, a technique for surgical revision of a failure of external dacryocystorhinostomy. Cooperation between the ENT doctor and the ophthalmologist is required, after all, there is a learning curve for rhinoscopy and the anatomy of the anterior ethmoid, the latter being made more complex by the countless anatomical variations. Fortunately, endonasal dacryocystorhinostomy under endoscopic guidance is showing renewed interest thanks to new instrumentation and therapeutical tools. This technique is safe, minimally traumatic and effective: it must be a first-line technique, and can with time replace the external cutaneous approach.

Conflict of interest
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Consent
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