

Anatomical and Functional Results of Surgery for Congenital Ptosis by Frontal Suspension with Silicone Probe About 18 Cases

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Abstract

Original Research Article

Palpebral ptosis is the dropping of the upper eyelid and is one of the most common oculoplastic problems. This anomalous position of the eyelid is usually caused by a dysfunction of the lifting muscle, and can affect both adults and children. In the most serious cases, it can affect the visual axis by blocking the pupil and limiting or even totally preventing vision. The surgery treatment of palpebral ptosis is usually frontalis suspension allows to improve the vision field by raising the eyelid again while improving the physical appearance of the affected person by improving the look. We conducted a retrospective study on the anatomical and functional results of ptosis surgery using a silicone probe in 18 patients operated on in our establishment. The aim of this work was to evaluate the anatomical and functional results of the use of silicone probes in the frontal suspension and to highlight the advantages of silicone in this indication.

Keywords: Palpebral ptosis, eyelid, retrospective study, Silicone Probe.

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INTRODUCTION

Ptosis is a drooping of the upper eyelid related to a deficit in the levator apparatus thereof. The suspension of the upper eyelid from the frontal muscle represents a useful surgical technique in case of non-exploitable levator muscle and / or when bilateral suspension is necessary.

We thought it would be interesting to carry out a retrospective study on the anatomical and functional results of ptosis surgery using a silicone probe in patients operated on in our establishment.

The aim of this work was to evaluate the anatomical and functional results of the use of silicone probes in the frontal suspension and to highlight the advantages of silicone in this indication.

MATERIALS AND METHODS

We conducted a retrospective and comparative study in 18 patients (19 eyelids) operated in the ophthalmology department of Sheikh Khalifa Hospital in Casablanca, during a period of 26 months between December 2017 and February 2020.

We excluded from our study, patients with acquired ptosis, a history of surgery (intraocular, strabismus or eyelid), synkinetic movements of the upper eyelid and corneal abnormalities.

All patients were reviewed to determine the functional and anatomical outcome. Patient satisfaction was also collected.

The clinical information was supplemented by reminders from patients and parents, as well as follow-up files obtained from referring doctors.

A complete family history and history of the disease, including its onset, was performed for all patients. Detailed ophthalmic and orthoptic examinations were performed on all children. Routine preoperative examinations included observation of Bell's phenomenon and upper eyelid margin level, measurement of retained levator and frontal muscle function, vision screening, and a general physical examination. For this surgery, the measurement of retained levator muscle function should be <7 mm and frontal muscle function should be normal. We also took into account aesthetic, visual aspects (where the eyelid

obstructed the visual axis) and the presence of a significant compensatory posture of the head.

The data from the interview and the clinical examination were analyzed according to a pre-established operating sheet comprising 4 sections: Epidemiological, clinical, therapeutic and evolutionary data.

All patients were operated by the frontal suspension method with a silicone probe under general anesthesia. Preoperative and postoperative evaluation included functional and anatomical results namely eyelid asymmetry (defined as a difference of 1 mm between the two eyelids), uncorrected visual acuity (VA) and best VA correction (BCVA) measured by age-appropriate methods were examined and used for statistical analysis.

Eye alignment and eye motility were assessed in all cases. The importance of ptosis is classified as follows: Weak ptosis: <2 mm; average between 2 and 4 mm; important > 4 mm .

The function of the lifter was tested according to the usual methods by blocking the frontal; it was estimated as good if it was greater than 8 mm, average if it was between 4 and 8 mm, poor if it was between 2 and 4 mm, and zero if it was less than 2 mm.

Data entry and analysis was performed using Microsoft Excel and software (SPSS). The statistical study used a descriptive analysis.

RESULTS

This study involves 20 eyelids in 18 patients (13 boys and 5 girls). 16 patients had unilateral ptosis and 2 patients had bilateral ptosis.

The average age at treatment was 9.4 years with extremes ranging from 4 years to 29 years. A male predominance was noted in our series with a sex ratio of 2.6.

On ophthalmological examination, amblyopia was found in 78.4% of cases. Regarding the ptosis, it was major in 64.2% of cases and moderate in 35.8% of cases. The pupil was completely covered in 57.3% of cases and two-thirds above or half in 42.7% of cases (Figure-1).

All patients were operated using the frontal muscle eyelid suspension technique using a silicone probe (Figure-2). In patients with bilateral ptosis, the operation of the second eyelid was delayed by an average time between surgery of the 2 eyes of 20 ± 7.5 days.

The functional results were evaluated and grouped according to the Manners criteria into very

satisfactory, satisfactory and insufficient. The aesthetic and anatomical results were evaluated according to the Cosmetic Grading Scale which studies the palpebral arch, the symmetry of the two palpebral slits and the appearance of the eyelid crease [1].

In our series, our functional results were considered satisfactory in 93.2%. Concerning the anatomical and aesthetic results, 92.8% of the ptosis had a satisfactory result for the palpebral arch, 87.6% for the symmetry of the two palpebral clefts and 93.1% for eyelid crease reconstruction.

In our series, the ptosis recurred in 3 eyelids, which means 15% of cases. All recurrence cases were taken up by the same suspension material which is the silicone probe. The mean time between surgery and recurrence was 4 ± 2 months. Concerning the complications, we found a case of lagophthalmos, which means 5% of cases and an anomaly of healing in 5% of cases.



Fig-1: Unilateral ptosis in the left eye covering the pupil



Fig-2: Postoperative result of ptosis surgery by frontal suspension with silicone probe

DISCUSSION

The most common treatment for congenital ptosis is surgery, and surgical approaches vary, depending on the severity of the ptosis and the function of the levator muscle [2, 3]. The severity of ptosis is classified as mild (2mm), moderate (3mm) or severe (≤ 4 mm). Assessment of levator function is based on upper eyelid excursion and described as poor (≤ 4 mm), average (5–7 mm), or good (sup8 mm) [4, 5].

The indications for frontal suspension are mainly linked to neurogenic (3rd cranial pair paralysis) and myogenic (myasthenia gravis, progressive external ophthalmoplegia, Kearns-Sayre syndrome, oculopharyngeal muscular dystrophy, and Steinert's disease) [6, 7]. Unilateral or bilateral congenital ptosis in children with greatly impaired levator strength may

benefit from maximum levator resection (greater than 22 mm) or suspension as a first intention [8]. The frontal muscle eyelid suspension technique is the most used in severe ptosis with poor upper eyelid levator muscle function ($\leq 4\text{mm}$) [9].

If there is no sign of developing amblyopia, the operation can usually be delayed until the child is between 3 and 5 years old [9, 10]. At this age, the structures of the eyelid are better developed, and it is also possible to harvest fascia lata if necessary [11]. Autogenous fascia lata has long been considered the material of choice for frontal suspension. However, reports of fascia lata causing scar contracture on the upper eyelid, scar on the thigh, and longer anesthesia prompted us to use a silicone probe as the material of choice in our series.

If surgery is postponed, children should be monitored monthly for signs of amblyopia, worsening ptosis, or development of abnormal head posture [12]. However, surgery is recommended at an early age to avoid irreversible visual impairment [13, 14]. Indeed, when the ptosis is severe hiding the visual axis, the amblyopic risk requires urgent intervention.

In our series, we noted the importance of the form associating major ptosis with zero levator function (64.2% of cases). In Ducasse's series [15] comprising 164 eyelids, the ptosis is often moderate, and the function of the levator muscle of the upper eyelid varies according to the etiology: good in Claude Bernard Horner's syndromes, myasthenia gravis and in cases of aponeurotic ptosis, moderate in congenital ptosis, weak in paralysis of III.

The surgical techniques described are numerous, and the suspension of the upper eyelid from the frontal muscle is the technique most used. This technique exploits the lifting character of the eyelid by the frontal muscle. Of the two varieties of eyelid suspension, Crawford's technique with two inverted Y-shaped strands and Fox's trapezoidal one-strand technique, we only use Fox's in our series [16].

For many years now, biomaterials have appeared in surgery, in particular orbital-palpebral surgery, thus opening the debate opposing them to autologous or autogenous transplants. Current biomaterials combine ease of use with reduced operating time (no time to collect from a donor site) and good tolerance at the recipient site. The latter obviously remains lower than that of autologous tissues with an increased risk of infection, extrusion and fibrosis [16].

It is generally accepted that the suture material only serves as a temporary skeleton for the formation of scars; therefore, no difference is anticipated between different suture materials as long as they remain in the

correct position during the inflammation and healing processes [16].

The materials used are numerous, falling into: Autologous materials; Two are the most widely used, the aponeurosis of the temporalis muscle and the fascia lata [17]. Other materials are used by some authors, such as the long palmar tendon [18]. The temporal muscle aponeurosis offers several advantages, firstly the knowledge of the temporal region by ophthalmologists during biopsies of the temporal artery, the scar is hidden by the hair and only one surgical field is necessary [16]. However, the fascia lata requires two surgical fields, as well as a particular positioning of the patient. The scar is visible in the thigh and the patient experiences discomfort when walking for the first few days. Some complications are described as haemorrhage and muscle herniation [19]. This technique is performed on children over 3 years old although some authors have performed it even on younger children [20]

There is also biomaterial with expanded polytetrafluoroethylene (PTFE) and mersilene mesh as the leader [20]. Their porous structure makes them biocompatible with fibrovascular structures. Their main complication is infection and externalization, and its high cost limits its use [21]. Also, there are synthetic threads, initially used in the absence of other alternatives and as a temporary treatment in children at a major risk of amblyopia.

As for silicone, it is an excellent biomaterial, not biocolonisable, not allergenic and hydrophobic, with elastic properties. It is packaged in the form of tubing with a diameter of 0.64 or 0.94 mm with or without surface treatment. The Bi-K® intubation probes have a diameter of 0.94 mm which prove to be the most suitable for eyelid suspension, it is the material that we have used in our series with good anatomical and functional results [21].

The good results achieved should not overlook the complications associated with this surgery, which can in some cases be dramatic. Exposure keratitis is the prime example that can lead to corneal perforation and eye loss if not carefully monitored. It is almost constant during any overcorrection, and worsened when the defenses of the eye are reduced [22]. Only one case of lagophthalmos was noted in our study.

CONCLUSION

Silicone currently retains its full place as a suspension biomaterial in ptosis surgery by suspension of the upper eyelid to the frontal muscle. Because of its advantages of elasticity, reversibility and the ability to repeat the procedure, the use of this biomaterial gives stable and satisfactory functional and anatomical results.

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