

Evaluation of Straight needle threading technique by using a silk suture as a frontalis sling for the management of sever blepharoptosis

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ABSTRACT

Aim: To evaluate the use of Straight needle threading technique to perform frontalis sling by silk suture material as a surgical correction of severe blepharoptosis cases.

Settings and Design: a prospective study was performed on patients who underwent 3-0 silk frontalis suspension using a Straight needle threading technique with an average of 8 months follow up period. Baker's criteria for satisfactory results was used in which the correction of ≥ 1 mm from the normal side (or corrected side in bilateral ptosis).

Patients and Methods: An eighty seven eyes in 67 patients were done, 25 eyes were operated on under local anaesthesia and 62 eyes under GA, 20 cases bilateral and 47 cases unilateral, 55.2% males (37 cases) and 44.8% females (30cases). The average age was 12 years (range 2-70 years).

Statistical analysis was done by using the frequency values analysed by the program Statistical package for social sciences (SPSS) version 20 to analyse the results.

Results: it was satisfactory in 76.4%, unsatisfactory in 23.6%, overcorrection 3.5%, under correction 15.3%, Entropion 0%, Lagophthalmus 4.8%, exposure keratitis 0%.

Conclusion: the use of silk suture by straight needle threading technique is fast, easy, and low cost method to correct a complex problem like sever ptosis with a comparable aesthetic and functional results to other non- autologous materials, with good safety profile.

Key words: needle threading technique, frontalis sling, blepharoptosis

مع إبرة مستقيمة كمادة لربط الجفن بالحاجب لعلاج الحالات الشديدة من حطول الاجفان تقييم تقنية استخدام الخيط الحرير غاية الدراسة هي تقييم تقنية استخدام الخيط الحرير مع إبرة مستقيمة كمادة لربط الجفن بالحاجب كحل جراحي لعلاج الحالات الشديدة من حطول الاجفان.

ضبط والتصميم : تم إجراء دراسة استطلاعية على المرضى الذين خضعوا لعمليات ربط الجفن بالحاجب لغرض تصحيح الهطول الشديد بواسطة خيط حرير ٠-٣ موضوع على ابرة مستقيمة، حيث كانت متوسط فترة المتابعة ٨ اشهر مع اعتماد مواصفات Backer لتقييم النتائج المرضية بواقع تصحيح يصل الى ≥ 1 مم من الجبهة الطبيعية (او من الجبهة المصححة في الحالات الهطول ثنائي العين).

الأساليب و المواد: - اجريت العملية على سبعة وثمانون عيناً في ٦٧ مريضاً ، ٢٥ عيناً تحت التخدير الموضعي و ٦٢ عيناً تحت التخدير العام ، ٢٠ حالة ثنائية و ٤٧ حالات من جانب واحد ، وكانت نسبة الذكور ٥٥.٢ ٪ (٣٧ حالة) و ٤٤.٨ ٪ للإناث (٣٠ حالة) . وكان متوسط العمر ١٢ عاماً (المدى ٢-٧٠ سنة) .

تم إجراء التحليل الاحصائي باستخدام قيمة تردد انتجت بواسطة برنامج SPSS النسخة ٢٠ لتحليل النتائج . النتائج: كانت مرضية في ٧٦.٤ ٪ من الحالات ، وغير مرضية في ٢٣.٦ ٪ ، وكان إفراط التصحيح بنسبة ٣.٥ ٪ ، وكان ١٥.٣ ٪ من الحالات تحت تصحيح ، اما الشتر ٠ ٪ وعين أرنبية ٤.٨ ٪ ، والتعرض للتهاب القرنية ٠ ٪.

الخلاصة:- تقنية استخدام الخيط الحرير مع إبرة مستقيمة كمادة لربط الجفن بالحاجب طريقة سريعة وسهلة و منخفضة التكلفة و طريقة لتصحيح مشكلة معقدة مثل الهطول الشديد للاجفان مع نتائج جمالية ووظيفية مماثلة لمواد غير طبيعية أخرى مستخدمة انفس الغرض ، مع مستوى سلامة جيدة .

INTRODUCTION

Blepharoptosis is a combined problem in having functional and aesthetic components.^[1,2] The functional problem is due to blocking of the visual field but the aesthetic problem has more impact on the patient's psychology and life, this impact is magnified in the third world by the lack of family orientation and the delay in seeking medical advice which make the patient's especially children under the pressure of teasing from anger brothers or friends. However in teenagers and adults, ptosis correction by using synthetic materials is easy to be done as outpatient procedure, saving time and money for people especially those traveling from far distances. Only a few patients choose autologous tissue as additional scars may present with donor site morbidity which is not accepted in Iraqi society especially in females. Moreover, the cost of using autologous tissue is another detrimental factor for it needs an additional procedures as harvesting the fascia is difficult under local anaesthesia. The objective of the present article is to evaluate the use of silk suture in the management of severe ptosis by frontalis sling threaded straight needle. A simple solution to a complex problem which takes only a few minutes in the outpatient surgical unit or may be done under general anaesthesia.

MATERIAL AND METHODS

Prospective study evaluating the results of frontalis sling procedure using 3/0 silk suture with a straight needle. The procedure is done for congenital and acquired ptosis to patients without age limits. The selected patients were chosen with severe ptosis and poor levator muscle function (0-5mm).^[1,3] The evaluation of the results was done by measurements of Marginal Reflex Distance "MRD1, MRD2", Palpebral Fissure height, eye ball mobility, bell's sign, tear film and eye closure during sleep. Jew winking phenomenon should be excluded. In the post-operative period these

measures are evaluated MRD1, MRD2, Palpebral Fissure height visible pretarsal height, and complications looked for are lagophthalmus, lid lag, lash eversion, entropion, and exposure keratitis. An eighty seven eyes in 67 patients were done, 25 eyes under local anaesthesia and 62 eyes under general anaesthesia (GA), 20 cases bilateral and 47 cases unilateral, 59% males (50 cases) and 41% females (37cases). The average age was 12 years (range 2-70 years).

Statistical analysis was done by using the frequency values analysed by the program Statistical package for social sciences (SPSS) version 20 to analyse the results.

Surgical technique

The operation is done under local or general anaesthesia, according to the patient's age and preferences. Under local anaesthesia, supra orbital nerve block is used with local infiltration of Xylocain (2%) with Epinephrine (1-80,000) to the lines of sling Procedure. Incision is made above the eye brow by No. 15 blade in the mid pupillary line (this is the only incision needed), with a straight needle, a 3-0 silk is threaded down through the centre of the lid below the Orbicularis oculi muscle, exiting through a point in the mid pupillary line a few mm above the eye lash line (Fig-1). This first strand is then threaded medially by passing the needle through the same midline exit point to pass it medially for 1cm (Fig-2). By passing through the same exit point, the threads were carried vertically underneath the Orbicularis oculi muscle and under the brow to exit from above the brow few centimetres medially to the central incision. The lateral ring is then completed by passing the thread to the central incision the same procedure are repeated with another needle to do the lateral ring, the two rings are completed by bringing the threads through the first central incision (Fig-3). The threading would not take more than 10 minutes but the important step is to balance the lid elevation to the best results

which should takes time, especially in the local anaesthesia, the patients were asked to sit watching a mirror while balancing the lid.

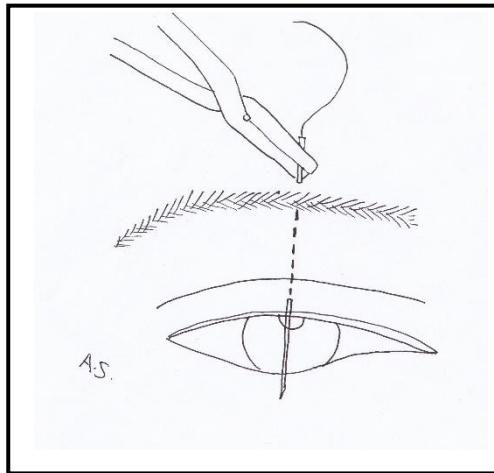


Fig 1. Showing the first incision and the needle passing through down to the lid margin.

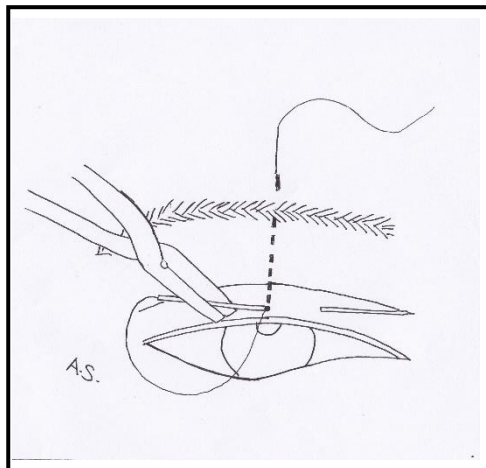


Fig 2 showing the second pass of the needle through the same previous exit point.

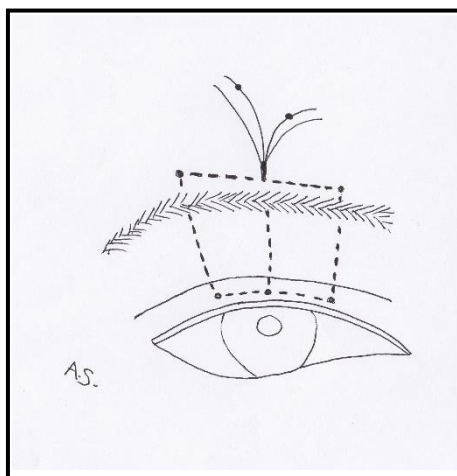


Fig 3. showing the completed two lumps of silk suture in place and the threads exiting through the starting incision and the lid ptosis is corrected

Balancing the lid

This is depending on whether the surgery is done under general or local anaesthesia. Under general anaesthesia the balancing is slightly difficult as the patient is not reactive and the judgment would depend on the surgeon's experience only. The way preferred by the author is to do the maximum limit of over correction to get an aesthetically pleasing lid level by setting the lid to a level just before tenting at most of the times, to a level about 1mm above the upper limbus (while the eye in the central location fixed by pence grasping the conjunctiva). By doing so a normal lid height is achieved (compared with the other lid in unilateral and to each other after correction in bilateral cases). Adjusting the symmetry of palpebral fissure is done by playing with individual strand of the silk suture to elevate or depress the corresponding area of the lid. This will produce a state of over correction which will vanish over the course of the next weeks by the effect of oedema and cutting effect of the silk to tissue and by recession of the knots in side of the central wound. Under local anaesthesia the balancing is much easier and more predictable as with the cooperation of the patient the final lid level can be judged in comparison with the normal eye with a slight over correction. Dressing is done with the application of Frouse stitch to the lower eye lid and filling the eye with Fusithalamic eye ointment, then taping the stitch to the forehead and covering the eye by occlusive eye dressing to protect it from desiccation. The patient will be directed to apply ointment to his eye four times daily.

Post-operative follow up was carried out every three days, during the first week. At the end of the period, the Frouse stitch was removed while the ointment applications was continued, occlusive dressing of the eye was continued as well. Later weekly follow up was continued for one month so as well as the ointment application and eye occlusion as long as eye closure is incomplete during sleeping.

RESULTS

Frontalis sling by silk suture surgery was done on 87 eyes in 67 patients; 25 eyes under local anaesthesia and 62 eyes under GA, 20 cases bilateral and 47 cases unilateral. The cases were as follows:-

About, 55.2% males (37 cases) and 44.8% females (30 cases). The average age was 12 years (range 2-70 years). Nearly, 55% of the patients were below 16 years, 30% of the cases were between 17 to 40 years, and 15 % were above 40 years. The causes of ptosis are illustrated in (Table-1). The major cause of

ptosis is apparently congenital (78%), followed by ophthalmoplegia (12%) and minor cases were senile and oculomotor nerve (C3) palsy. All cases were severe ptosis except 4 cases were moderate, whereas levator muscle function was poor (less than 5mm) in 95.4%, fair function (5-8 mm) in 3.3% and only one case with good function (above 8 mm).

Table 1. Causes of ptosis.

Cause					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	congenital	68	78.2	78.2	78.2
	senile	6	6.9	6.9	85.1
	external ophthalmoplegia	10	11.5	11.5	96.6
	Oculomotor (c3) nerve palsy	2	2.3	2.3	98.9
	Acquired	1	1.1	1.1	100.0
	Total	87	100.0	100.0	

Summary of post-operative results in (Table-2) and photos of some patient can be seen in colour Plates (1,2,3,4,5).

Table 2. Showing the summery of the results

Results	percentage	
Satisfactory	76.4%	
Unsatisfactory	23.6%	Causes of unsatisfactory results
		Overcorrection 3.5%
		Under correction 15.3%
		Entropion 0%
		Lagophthalmus 4.8 %
		Exposure keratitis 0%

The follow up period was from 2 to 24 months with an average of 8 months. More detailed evaluations of the complications were done in the present study. Major complications were infection of the sling in (7%) and exposure of the central stitch (colour plate 6) and granuloma formation in 4% (colour Plate 7). The survey at the follow up period of the cases of eye closure during sleeping indicates that 61.4% of the patients had open eye during sleeping (less than 3 mm) whereas, 23% had open eye above 3 mm, 10.8% had normal eye closure during sleeping and only 4.8% had lagophthalmus during forceful closure. However, lid lag of less than 3mm were found in 65% of the cases, and those having more than 3mm were 34%. Entropion and exposure keratitis were not found in the present study, on the other hand, there was problems with lash eversion in 15% of the cases (colour Plate 1).



Color plate 6:-
5 years old child with post op
central stitch exposure



Color plate 7:- A case of bilateral congenital severe ptosis managed by silk suture showed granuloma formation in the area of the central stitch 3 month post op refuse surgery and managed conservatively.



Color plate 8:- 33 years man with progressive external Ophthalmoplegia

DISCUSSION

Straight needle threading technique was used in the present study and the results suggested that it can reduce the need for large incisions, reducing the time of surgery and make the operation simpler, it can be carried out as an outpatient procedure under local anaesthesia only. The use of silk suture as a sling material is not new but there are very few data about its use in literatures. However, this material holds the benefit of knote security which is vital in judgment of the final position of the lid during lid adjustment. It is also of low cost, thus, reducing the cost of the surgery, as silicone rods are more expensive and not always available here in Iraq. In the present study 87 eyes were operated on in 67 patients (20 bilateral), most of them were children (55%) under age of 16 and since the causes of ptosis were congenital in 78.2%, but 23.2% of these cases didn't consult surgeon for solution during childhood. External Progressive Ophthalmoplegia was found in 12% of the cases (5 patients), (colour Plate 8). The severity of ptosis was evaluated by the MRD1 scoring in which 0-1mm was considered severe and 2-3mm moderate, however most of the cases reported here were having severe ptosis (95.4%) and poor function (95.4%). The indication of these cases is lid suspension procedures like frontalis sling. By applying Baker's evaluation criteria of correction of ptosis into satisfactory and unsatisfactory group, in this study 81.2 % of the patients were having

satisfactory lid height, within 1mm from the other side. But due to the presence of other exclusion criteria like exposure keratitis, Entropion, and Lagophthalmus,^[4] The success rate dropped to 76.4% as Entropion, exposure keratitis 0% and 4.8% Lagophthalmus. However, different studies showed variety of results starting with a success rate 70.97% (28 lids) at a single operation^[5], to 74% (23 lids),^[6] and 75% (10 lids).^[7] Results were satisfactory in 77% (69 lids)^[2], up to 89% (64 lids)^[4], and 91% success rate (11 children 8 years follow up)^[8]. Moreover, the present results indicate that 23.6 % were unsatisfactory, 3.5% out of which were over corrected but still 15.3% complains of under correction, that's showing a tendency of severe ptosis to recur even after maximum possible elevation. This complication may be attributed to the cutting effect that silk suture may exert on tissue with the presence of oedema in the early post op period and /or the failure of pushing the knot of the silk deep in the forehead wound during adjustment, which ultimately costs more than a millimetre of descent of the lid. However in general, these results are comparable to the results of fascia sling.^[2] Moreover, despite the tendency to maximally overcorrection, the present results did not face any case of exposure keratitis as precautions were taken to avoid that by allowing the eye to adapt to the new situation by long duration of eye occlusion (above 7 days) and eye

lubrication (especially during sleeping) for a long duration of more than 2 months until the patient show no sign of irritation after a night without lubrication. In the meantime, these results are comparable to the results included in the review of literatures.^[6] In a cohort study, about 26% risk of exposure keratopathy occurred following silicone frontalis suspension. However, it is important to note that the risk of major corneal complications, such as ulceration, was rather low (3%).^[9] The present results differ from the available results by the absence of Entropion (0%) which is a problem in most of the techniques mentioned. On the contrary there is 15% of lash eversion which doesn't cause a problem to the cornea but has an impact on the aesthetics of the eye. It is suggested here that the silk threading technique goes superficial just beneath the orbicularis oculi muscle, which is in the anterior lamina of the lid and descend far down the lid near to the eye lashes on the anterior side of the tarsus. So the vector of pulling of the sling is in the anterior lamina and pulling on the lashes to evert not to invert. Whereas, in most of the available techniques the slings were hidden deeper in the lid,^[2,10] to avoid visibility and are fixed to the upper part of tarsus making the pulling vector of the slings more posterior and causing Entropion. Infection was found in about 7.1% of the cases, while, exposure of the central stitch was 4.7%, however the infection rate in Mersilene mesh was 18%^[11] and Polyfilament nylon was 12 %.^[12] The infection rate of Prolene was 4%,^[6] which was lower as it was monofilament material. Both of the infection and exposure stitches were found to be not responding to conservative management by long duration of antibiotics cover or surgical reduction of the exposed central stitch. The best solution, for these problems however, is the removal of the silk suture and redoing the sling after months of cure of infections. Lid lag is a sequel of frontalis sling and not a complication,^[13] and Lagophthalmus may have a rate of up to 23%^[14].

CONCLUSION

The use of silk suture by Straight needle threading technique proved to be fast, easy and low cost method to correct a complex problem like severe ptosis with a comparable aesthetic and functional results to other non-autologous materials, and with good safety profile.

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