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The removal of 10/0 polyester (Mersilene) sutures after small incision congenital cataract surgery

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PURPOSE. *To evaluate the use of 10/0 polyester (Mersilene) sutures for closure of small corneal incision after congenital cataract surgery.*

METHODS. *The authors retrospectively reviewed the medical records of 58 cases (42 patients) who underwent congenital cataract extraction and intraocular lens implantation between 1999 and 2004, using Mersilene sutures. An examination looking for suture-related complications and retinoscopy was done 1 week after surgery and then every month for 6 months. The sutures were removed in cases of local tissue reaction, but not due to high postoperative astigmatism. Paired t-test was used to compare patients' age and astigmatism level in those cases who had suture removal (Group 1) as opposed to those who did not (Group 2).*

RESULTS. *In 10 cases (17%) corneal vascularization, necessitating suture removal, was found during 6-month follow-up period, without the trigger of loose suture. Patient age was 3.5±3.3 years and 4.4±3.3 years in Groups 1 and 2, respectively. At 1 week postoperatively the astigmatism value was 1.7±1.7 diopter (D) and 2.3±2.2 D in Groups 1 and 2, respectively, and it reduced to 0.9±0.8 in both groups at 6 months postoperatively. One case of endophthalmitis was encountered 2 days after suture removal.*

CONCLUSIONS. *Removal of Mersilene sutures after congenital cataract surgery is required in cases of corneal vascularization, occurring during the first months postoperatively. Owing to the risk of general anesthesia and infection, suture removal should be considered with caution in cases of postoperative astigmatism. (Eur J Ophthalmol 2008; 18: 82-6)*

KEY WORDS. *Congenital cataract, Sutures, Surgery*

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INTRODUCTION

Suture-related complications after cataract surgery are well-documented findings in adults, ranging from high astigmatism, recurrent conjunctivitis, and giant papillary conjunctivitis to sight-threatening pathologies such as suture abscesses and even endophthalmitis.

The suture material has a crucial effect on these problems. Nylon sutures have high incidence of complications after cataract surgery due to their degradation (1-4). Monofilament polyester sutures (Mersilene) do not hydrolyze or disintegrate and proved in adults to be superior to nylon. Nevertheless, Mersilene sutures may cause severe adverse effects, which would necessitate their removal (5, 6).

In adults, suture removal is recommended as a way to correct postoperative astigmatism.(7, 8). In contrast, we published (9) that in children high early postoperative astigmatism after congenital cataract surgery has spontaneously reduced during the first months after the surgery. Therefore, the indication for suture removal in these cases is mainly local reaction to the suture material and not high

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postoperative astigmatism.

Although several studies investigated suture-related problems in adults, we were unable to find any report that evaluated suture-related complications after congenital cataract surgery. The purpose of this study was to describe the problems related to Mersilene sutures in children after small incision congenital cataract, and to show the results of their removal.

MATERIALS AND METHODS

The study was performed in accordance with the ethical standards laid down in the 1964 Declaration of Helsinki.

We reviewed the medical records of 58 cases (42 patients) who underwent surgery for congenital cataract between 1999 and 2004 using Mersilene sutures. All included patients appeared for their scheduled examinations during 6-month follow-up period. Exclusion criteria included ocular or systemic abnormalities besides congenital cataract, or surgeries other than sutures removal during 6 months after the cataract surgery.

All patients had undergone extracapsular cataract extraction and intraocular lens (IOL) implantation, using the same surgical technique. Two paracentesis ports were opened at the limbus at the 2- and 10-o'clock positions. An anterior chamber maintainer (Visitec, Warwickshire, England) was used, and capsulorrhexis was performed with a bent 25-gauge needle. Lens material was aspirated with an aspirating cannula (Anis; Storz, St. Louis, MO, USA). In some eyes, posterior capsulotomy and anterior vitrectomy were performed with a vitrector instrument (Occutome; CooperVision, Irvine, CA, USA). For IOL implantation the cornea was entered at the 12-o'clock meridian just anterior to the terminal ends of the conjunctival blood vessels as they cross the limbus. A 6.0-mm optic, three-piece foldable hydrophobic acrylic IOL (AcrySof, Alcon, TX, USA) was used and its power chosen for targeted refraction to match the eyes' expected refractive growth with age. In most cases, the IOL was implanted in the capsular bag, but in some cases, it was placed in the sulcus.

The corneal wounds made for the paracenteses and for IOL implantation were closed with interrupted partial thickness stitches, using 10-0 polyester (Mersilene; Ethicon, Edinburgh, Scotland) sutures, which were rotated to bury the knots thereafter.

All patients were treated postoperatively with dexamethasone sodium phosphate and neomycin sulfate eyedrops applied six times a day for 1 week and then four times a day for an additional 2 weeks and with 0.5% tropicamide twice a day for 2 weeks.

The refractive error of the surgically treated eye was measured (as part of a complete eye examination) with streak retinoscope 1 week after surgery and then every month for 6 months after dilation of the pupil with 0.5% tropicamide. In all patients, the refractive error was corrected with spectacles soon after surgery, and treatment for amblyopia was instituted when indicated. Likewise, any suture related complications such as inflammation, vascularization, or giant papillary conjunctivitis were recorded.

In cases of suture-related complications the sutures were promptly removed, after treatment of any concurrent external eye infections. The procedure was done in all cases under general anesthesia, and included elimination of offending organisms, using povidone-iodine 5% solution, a cut in one of the external corners of the loop, and removal of the suture material. Antibiotic drops were used after the procedure. Careful follow-up for early detection of adverse reaction to the procedure was performed thereafter.

The main outcome measures were suture-related complications encountered during 6-month follow-up period, the timing of these complications' presentation, difference in age and the magnitude of astigmatism between those patients who had suture removal and those who had not, and complications upon suture removal.

t-Test was used to compare the patients' age and the magnitude of postoperative astigmatism between both groups. A p value less than 0.05 was considered significant.

RESULTS

Fifty-eight operated eyes of 42 children, aged 2 months to 12 years, were included in this study, and were separated into two groups. Group 1 consisted of 10 eyes of 10 patients, who had suture removal during 6-month follow-up period. Group 2 consisted of 48 operated eyes of 38 patients who did not undergo suture removal. Six patients had both eyes operated, in which one eye underwent suture removal and was considered for Group 1, while the contralateral one did not, so it was related to Group 2.

In 10 cases out of 58 (17%) suture-related complications were encountered during 6-month follow-up period. The problems included corneal vascularization with or without

conjunctival irritation, and the timing of their presentation ranged from 3 weeks to 5 months, with mean ± SD of 3.2±1.8 months, after the cataract surgery.

The children in Group 1 were aged 2 months to 11 years (mean ± SD, 3.5±3.3 years), and the age in Group 2 ranged from 2 months to 13 years (mean ± SD, 4.4±3.3 years). The change in patients' ages between the two groups was not statistically significant (p=0.45).

Figure 1 presents the magnitude of the refractive astigmatism in each of these groups. The astigmatism levels measured at 1 week postoperatively were ranged 0–6 D and 0–10 D in Groups 1 and 2, respectively. These values were not significantly higher in Group 2 than in Group 1. Nevertheless, the mean astigmatism decreased in both groups during 6-month follow-up period to less than 1 D (ranging from 0–2 D and 0–2.5 D in Groups 1 and 2, respectively).

In one case a complication of endophthalmitis was encountered. A 7-year-old girl underwent suture removal 5 months after a successful cataract surgery. Two days after the procedure the patient presented with a history of pain, decreased vision, and redness in her eye. Examination revealed visual acuity of light perception, intraocular pressure of 17 mmHg, conjunctival injection, opaque cornea, and hypopyon filling the whole anterior chamber. The cataract wounds were Seidel negative. After examination the patient had anterior chamber lavage, vitrectomy, and injection of intravitreal vancomycin and ceftazidime. Cultures grew *Streptococcus pneumonia* sensitive to vancomycin. Four days later the patient underwent a second vitrectomy and intravitreal antibiotic injection due to insufficient improvement. After each operation the patient was placed on antibiotic, cycloplegic, and steroid drops based on clinical course.

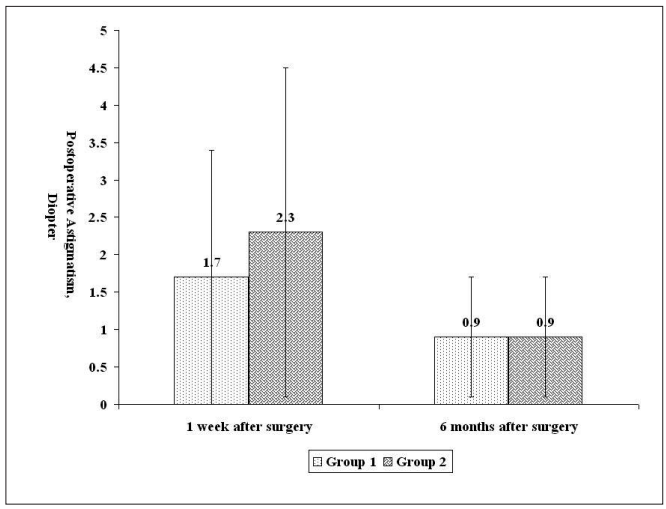

Fig. 1 - *Refractive astigmatism outcomes of children who had congenital cataract surgery and intraocular lens implantation. Group 1 consisted of 10 cases, who had suture removal during 6-month follow-up period; Group 2 consisted of 48 cases, who did not undergo suture removal during 6-month follow-up period.*

DISCUSSION

Suture-related complications are common after cataract surgery in adults. Our results show an incidence of 17% for suture-related complication, necessitating suture removal, during 6-month follow-up period after congenital cataract surgery using 10/0 polyester (Mersilene) sutures. These problems included corneal vascularization and conjunctival irritation, without the trigger of loose sutures, and the timing for their presentation ranged from 3 weeks to 5 months after the cataract surgery. Although the vast majority of the suture removal cases were uneventful, endophthalmitis was seen after one of these procedures.

In adults the incidence and the severity of the suture-related complications were influenced by the material of the suture used during the cataract surgery. Nylon sutures have a high incidence of complications and can cause sight-threatening pathology (1-4). Due to these problems, which are the result of their biodegradation in situ, routine removal of nylon sutures was advocated by several authors (2, 4).

On the other hand, in adults Mersilene was found to have low risk of consequent ocular complications after cataract surgery, and therefore its routine prophylactic removal is not necessary. Hollick and colleagues (6) found that 29% of patients with interrupted 11/0 Mersilene sutures had suture-related complications other than high astigmatism that necessitated their removal during a mean follow-up of 3 years. The most common (60%) of these complications was loose suture with adherent mucus and corneal vascularization. None of these patients had suture removal throughout 7-month period after the operation for problems other than high astigmatism.

Similar results were reported by King et al (5), which showed that 20% of patients with Mersilene sutures needed suture removal for problems except astigmatism within 3 years of surgery, the commonest of which was loose suture. Moreover, an electron microscopic analysis of these sutures after 48 months in situ has shown mini-

mal erosion, approving their finding of no clinical biodegradation.

We were unable to find any literature report presenting the outcome of Mersilene sutures after pediatric cataract surgeries. Similar to the article stated above regarding adults (6), broken sutures were not found in our pediatric case series. However, two important differences exist: 1) whereas no case of corneal vascularization was associated with suture loosening in our study, suture loosening was the most common complication in adults; 2) while 17% of our pediatric cases had suture-related complications, requiring their removal, during the first 6-month period after the operation, none of the adults had such problems so early after the operation. Therefore, we recommend routine frequent check-up of these pediatric patients for suture-related complications during the first weeks after the congenital cataract operation. More research is needed in order to find out why children react so quickly to these sutures even without observed stimuli such as loose suture.

We formerly found an association between patients' age and postoperative astigmatism after congenital cataract surgery (9). Based on the fact that our results regarding suture-related complications in kids were so different from those published about adults, we wanted to check if an association exists between these complications and the children's age. As can be seen from the results, such association was not found: patients' age was similar in those who have undergone suture removal (Group 1) and in those who have not (Group 2). More research, using larger patient groups, is needed in order to verify this result.

In adults, an effective way to reduce or eliminate the postoperative astigmatism is through the removal of one or more interrupted or continuous sutures. This procedure relieves wound compression, thereby altering the corneal curvature, and is recommended only in eyes with postoperative astigmatism of at least 3 D (7, 8). However, we showed that in children high early postoperative astigmatism after congenital cataract surgery has spontaneously reduced during the first months after the surgery (9).

Therefore, in this case series the indication for suture removal was local reaction to the suture material and not high postoperative astigmatism. This policy is demonstrated in Figure 1: the mean astigmatism level of 1.7 D in those patients who have undergone suture removal (Group 1) was lower than the mean astigmatism of 2.3 D in those who have not (Group 2). As expected, a regression of nearly two-thirds of the astigmatism mean was seen in the patients of Group 2 during follow-up period, reaching a mean level lower than 1 D 6 months after the operation. Interestingly, a decrease in astigmatism also was seen in Group 1, even though all the sutures were removed, not only those in the steep meridian.

Suture removal in adults is an office procedure, done at the slitlamp using local anesthetics. On the contrary, general anesthesia and operation room are needed in children for this procedure. Furthermore, we found that children are exposed to the risk of infection after suture removal, similar to previously published data in adults (10). Several measures were taken in order to prevent this complication: 1) identification and treatment of concurrent infection with antibiotics; 2) application of povidone-iodine 5% solution before and after the procedure; 3) cutting of the sutures in one of the external corners of the loop in order to prevent access of the exposed part of the suture to the eye; 4) postoperative prophylactic antibiotic prescription; 5) careful follow-up after the procedure for early diagnosis and treatment of infection.

In conclusion, removal of Mersilene sutures, used for small incision congenital cataract, may be needed due to corneal vascularization, which in contrast to adults occurs during the first months after the surgery even without the triggering of loose sutures. Nevertheless, no association was found between children's age and the appearance of those problems. The procedure of suture removal in children must be done in an operation room under general anesthesia, and despite meticulous precautions may be complicated by infection. Therefore, it should not be used to treat postoperative astigmatism, which usually regresses spontaneously during the first postoperative months. Further study is needed in order to find methods for section closure without those suture-related complications.

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