DO MERSILENE SUTURES NEED TO BE REMOVED AFTER CATARACT SURGERY?

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SUMMARY

A major disadvantage of nylon sutures is the need to remove them post-operatively to prevent suture fracture and irritation. Mersilene (polyester) sutures do not hydrolyse or disintegrate and are in theory superior to nylon. Fifty-two consecutive patients were examined an average of 3 years after uncomplicated extracapsular cataract extraction with corneal sections sutured with interrupted 11/0 polyester. It was found that 29% had suture-related problems and required, or had previously undergone, suture removal for reasons other than high astigmatism. The most common problem was a loose stitch with adherent mucus and corneal vascularisation (17% of patients at review). Sixty-six per cent of patients with loose sutures reported discomfort. We would not advocate prophylactic removal, but patients with polyester sutures should be advised to return if they become symptomatic.

Degradation of nylon corneal sutures is a recognised cause of ocular morbidity following cataract extraction. Suture fracture and loosening can cause significant problems, ranging from irritation and recurrent conjunctivitis to giant papillary conjunctivitis, suture abscesses and even endophthalmitis.[1–4] Consequently routine prophylactic removal has been suggested by several authors.[1,4] Monofilament polyester sutures (Mersilene) do not hydrolyse or disintegrate,[5] and are in theory superior to nylon in terms of patient comfort and clinic time spent removing sutures. Polyester sutures are stronger than nylon, permitting use of a finer size (11/0 instead of 10/0). In this paper we review the condition of 11/0 polyester corneal sutures an average of 3 years after routine extracapsular cataract surgery.

PATIENTS AND METHODS

Seventy consecutive patients who had undergone extracapsular cataract extraction at least 2½ years previously were recruited from the theatre record and invited for review. The surgery involved a corneal section closed with five interrupted 11/0 polyester sutures. The sutures were rotated to bury the knots. The patients were questioned about symptoms that may have been attributable to their corneal sutures, such as irritability, discomfort and discharge. Slit lamp examination was performed to assess the state of the suture, presence of corneal vascularisation, conjunctival injection, presence of mucus and giant papillary conjunctivitis. If the corneal sutures had been removed previously, the cause for removal was ascertained from the patient's notes. Any loose or broken sutures were removed.

RESULTS

Fifty-two patients attended for review. The average length of time after surgery was 3 years (range 30–43 months). The majority of operations were performed by one consultant (32 cases or 62%); the rest were carried out by three surgeons in training. Fifteen patients (29%) were found to have suture-related problems or had previously undergone suture removal for reasons other than high astigmatism (Table I). Out of a total of 260 sutures (5 sutures in each of the 52 patients) 16 (6%) were removed.

At the time of review 9 patients (17%) had a loose suture with adherent mucus and corneal vascularisation. Of these, 6 (66%) were symptomatic (with 3 patients (33%) reporting mild irritation and 3 (33%) epiphora). These loose sutures were removed. None

Table I. Cause and timing of removal of sutures

Reason for removal of suture	Prior to discharge from clinic (less than 9 months post-operatively)	At review (30–43 months post-operatively)
Loose suture	2	9
Not buried	1	0
Unclear	3	0
High astigmatism	1	0

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of the patients reviewed had broken sutures, giant papillary conjunctivitis or suppurative keratitis.

Of the patients who had had sutures removed prior to discharge, the reason for removal was a loosening of the suture in 2 patients, occurring at 7 and 9 months post-operatively. Only one patient had had any sutures removed for astigmatism, at 2 months post-operatively. An additional patient had a suture removed at 8 months as the ends were not fully buried. The reason for suture removal could not be ascertained from the notes in 3 patients.

DISCUSSION

We have shown that 29% of patients with polyester sutures used for closure of corneal sections in cataract surgery require suture removal due to suture-related problems other than high astigmatism. Seventeen per cent of patients had loose sutures with adherent mucus and corneal vascularisation at the time of review, of whom 66% were symptomatic and required removal of the loose stitch. These results are similar to those of a recent study which showed that 20% of patients with polyester sutures needed suture removal for problems other than astigmatism within 3 years of surgery (13% of patients needed to have sutures removed for suture-related problems prior to discharge, and a further 7% at the time of review). However, none had symptoms which were attributable to their sutures.[5] This other study also found that the commonest problem was a loose suture.

The loosening of polyester sutures occurred in a surprisingly high percentage of patients, given that polyester is thought to be relatively non-biodegradable. Electron microscopic analysis of polyester sutures after 48 months *in situ* has shown minimal erosion, with only shallow grooves and laminations of the suture surface.[5] It is possible that some of these sutures were loose from the time of surgery; however, there was no evidence for this in the patients' notes. Other sutures may have loosened much later, possibly related to a reduction in tensile strength leading to relative lengthening of the suture. Some authors have postulated that there is a progressive loss of elasticity of polyester sutures, but that this is slower than occurs with nylon.[6] The hydrolysis of nylon sutures causes problems relatively early, before the reduction in their tensile strength has allowed them to loosen. Polyester sutures do not degrade early, and are present for long enough to lose their elasticity and become exposed. It is possible that with time more and more polyester sutures will loosen and become symptomatic. Further studies may demonstrate this and allow full evaluation of the role of polyester sutures in the long term.

A second possible method for suture loosening may be that if sutures are initially tight they exert stresses on the corneal stroma situated between the suture, which may cause remodelling of the compressed stroma, allowing the suture to become exposed.

Nylon sutures have a much higher incidence of complications after cataract surgery and can cause sight-threatening pathology.[1–4] Broken nylon sutures were found in 90% of patients after 3 years and caused symptoms in over half.[4] The symptoms caused by broken nylon sutures are severe enough to necessitate a casualty attendance, and in one study 14% of all clinic-registered patients seen in an ophthalmology casualty department attended with symptoms resulting from loose or broken nylon sutures.[2] No incidence of severe symptoms, requiring the patient to attend casualty have been reported in this study or previous reports on polyester sutures. We found the symptoms to be relatively mild, such as slight foreign body sensation and epiphora. None of our patients had giant papillary conjunctivitis or suppurative keratitis, which have been found to occur with the use of nylon corneal sutures. In one study of patients attending a casualty department over a 6 week period with symptoms resulting from loose or broken nylon corneal sutures, 25 of 44 patients (57%) were found to have giant papillary conjunctivitis, and 2 of 44 had suppurative keratitis.[2] The potential risk of sight-threatening pathology and the high incidence of symptoms associated with corneal sutures left *in situ* has led several authors to advocate removal of nylon sutures routinely at 3–12 months post-operatively.[1,4] This is obviously time-consuming for both patients and ophthalmology departments. The removal of nylon sutures even 6 months post-operatively can lead to unwelcome changes in astigmatism requiring a change in lens prescription.

We would advocate the use of polyester sutures rather than nylon for closure of corneal sections following cataract extraction, as polyester sutures do not undergo suture breakage and have a low risk of consequent ocular complications. The loosening of polyester sutures does not seem to cause severe symptoms or significant ocular pathology, and routine prophylactic removal of polyester sutures is probably not necessary; however, further long-term studies are necessary to demonstrate whether progressive loosening of sutures will occur with time. Patients should be advised to return if they become symptomatic.

The authors have no proprietary interest in the Mersilene suture.

Key words: Cataract extraction, Mersilene, Nylon, Polyester, Suture.

REFERENCES

1. Danjoux J, Reck AC. Corneal sutures: is routine removal really necessary? Eye 1994;8:339–42.

2. Archeson JF, Lyons CJ. Ocular morbidity due to monofilament nylon corneal sutures. Eye 1991;5:106–12.
3. Nirankari S, Karesh JW, Richards RD. Complications of exposed monofilament sutures. Am J Ophthalmol 1983; 95:515–9.
4. Jackson H, Bosanquet R. Should nylon corneal sutures be routinely removed? Br J Ophthalmol 1991;75:663–4.
5. King AJ, Deane J, Sandford-Smith J. *In situ* degradation of 11/0 polyester (Mersilene) suture material following cataract surgery. Eye 1994;8:676–9.
6. Cravey TV. Long-term corneal astigmatism related to selected elastic, monofilament, nonabsorbable sutures. J Cataract Refract Surg 1989;15:61–9.