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Immortal plain gut sutures: A case report

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ABSTRACT

Purpose: We report the case of a 79-year-old male who presented with irritation and foreign body sensation due to the subconjunctival plain gut sutures that did not dissolve three years after undergoing pars plana vitrectomy (PPV) for macular hole repair.

Observation: A 79-year-old male presented with foreign body sensation and irritation in his left eye. On slit lamp examination, the source of the foreign body sensation was two apparently intact plain gut sutures were visible under the conjunctiva, nasal and temporal to the cornea. These plain gut sutures were placed at the conclusion of PPV surgery three years prior to presentation. After discussion, the patient elected suture removal, and two thin, translucent suture fragments were removed. Histopathologic evaluation revealed eosinophilic dense collagenous material with frayed edges, compatible with gut suture, associated with rare macrophages and scant fibrous tissue.

Conclusion and importance: The sclerotomies created for PPV occasionally need to be sutured at the conclusion of surgery to ensure wound closure, to retain tamponade, or to reduce endophthalmitis risk. Plain gut sutures have been shown to cause less scleral inflammation and to improve patient comfort compared to Vicryl sutures. However, in this case the plain gut sutures had not dissolved three years after PPV and had caused discomfort for patient and needed to be removed.

1. Introduction

The sclerotomies created during microincision pars plana vitrectomy (PPV) may be self-sealing; however, sclerotomy closure is often facilitated by air or gas tamponade and occasionally diathermy. While generally less common, sutures may be required if the sclerotomies do not self-seal, if retention of tamponade is paramount, or if there is increased concern about endophthalmitis or ocular trauma in the immediate post-operative period.[1] Plain gut sutures, polyglycolic acid, and polyglactin 910 are commonly used. Among dissolvable sutures, plain gut has the lowest observed adverse reactions at 2% compared to 30% in polyglycolic acid and 14% for polyglactin 910 sutures.[2]

Another advantage of plain gut suture is its rapid degradation compared to other sutures, losing most of its strength between day seven and day 10. Complete dissolution of the suture typically occurs within 90 days. This short lifespan is accredited to its unique composition of sheep or bovine intestinal tissue and/or sheep submucosa.[3]

We report a case of 6-0 plain gut suture (Ethicon, Raritan, NJ) that remained under a patient's bulbar conjunctiva and within the sclera for more than 3 years after PPV closure.

2. Case

A 79-year-old male with a history of insulin-depended type 2 diabetes mellitus, osteoarthritis, 7th nerve palsy, cardiovascular disease, and a history of treated Lyme disease presented with a chronic irritation and foreign body sensation in the left eye. His medications included those for diabetes, cardiovascular disease, and gastrointestinal reflux. He was not on corticosteroids or other immunosuppressive agents. On slit lamp examination, it was noted that the cause for the foreign body sensation was 2 plain gut sutures located under the conjunctiva, nasal and temporal to the cornea. These sutures were placed at the conclusion of PPV for macular hole repair three years earlier.

The patient elected surgical removal of the sutures. Lidocaine 1%

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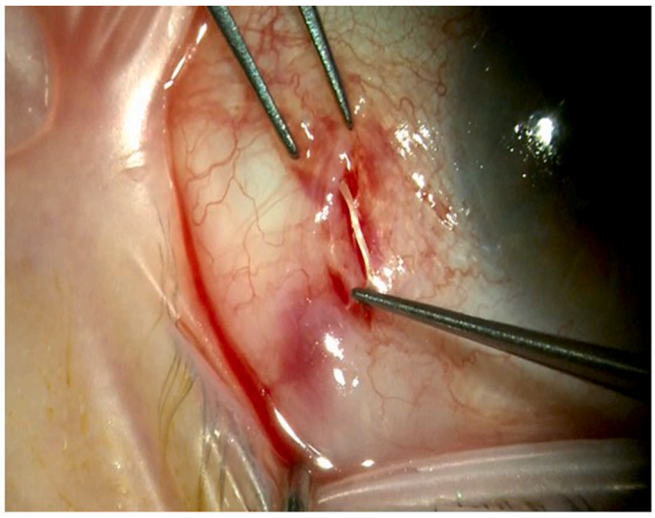

Fig. 1. Intraoperative photograph shows the suture. The plain gut sutures were exposed after conjunctival incision, and they were removed.

with a 1:100 dilution of epinephrine was administered into the subconjunctival space. Next, an incision was made in the nasal and temporal conjunctiva, and two thin, linear, foreign bodies were removed from the subconjunctival space (Fig. 1). Maxitrol ointment was applied, followed by a patch and shield.

Macroscopic evaluation revealed two white translucent suture fragments, 2 mm and 3 mm in length and less than 1 mm in diameter (Fig. 2A). Microscopically, the sutures were composed of dense, collagenous material with frayed edges, associated with rare macrophages and a focus of fibrosis (Fig. 2B). There was no evidence of acute or granulomatous inflammation. No organisms were identified. Two months after suture removal, the foreign body sensation was gone, the eye was quiet, and the patient was happy.

3. Discussion and conclusion

Biologic material such as plain gut are absorbed by proteolytic enzymatic digestion. In this 79-year-old male, the subconjunctival plain gut suture nasal and temporal to the cornea did not dissolve three years after PPV. To the best of the authors' knowledge, no similar observations in the human eye have been reported. There are both an acute and chronic phases to suture dissolution. The acute reaction reflects the injury inflicted by the passage of the needle and suture, and usually lasts for five to seven days. Once the initial reaction subsides, a thin connective tissue capsule, along with a few histiocytes and lymphocytes around the suture, forms around the suture. In contrast to non-absorbable sutures, absorbable sutures elicit a second phase of reactions called absorption. During the absorption phase, cells are almost exclusively monocytes with a few lymphocytes and scant or no polymorphonuclear neutrophils. After the absorption phase is complete, the site is marked by a collection of monocytes with characteristic brown, foamy cytoplasm.[4] However, in our case, the inflammatory reaction was limited to few macrophages and scant fibrosis.

In a study by Postlethwait et al., tissue reaction to sutures was studied in 666 specimens obtained from patients, ranging from one day to 23 years after the operation. They had 46 human tissue specimens containing catgut sutures, and the longest time a catgut suture had been in the tissue was 11 years after vaginal cuff closure. All catgut sutures that had lasted long in this study were surrounded by a connective tissue capsule with no evidence of absorption.[5]

We hypothesize that in our case, the early formation of dense, collagenous material and fibrosis in the early acute phase, has stopped the further migration of cells required to complete the acute phase reaction and commence the absorption phase. The pathology report also confirmed the lack of lymphocytes and any monocytes with foamy cytoplasm, which indicates that the absorption phase was never initiated in our case. In summary, this is a rare instance of plain gut suture "immortalized" without evoking an immune response.

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Patient consent

Consent has been obtained from the patient.

Authorship

All authors attest that they met the current ICMJE criteria.

Research ethics

Written consent to publish potentially identifying information, such as details or the case and photographs, was obtained from the patient(s) or their legal guardian(s).

Declaration of competing interest

The following authors have no financial disclosures: (HA, KL, RM,

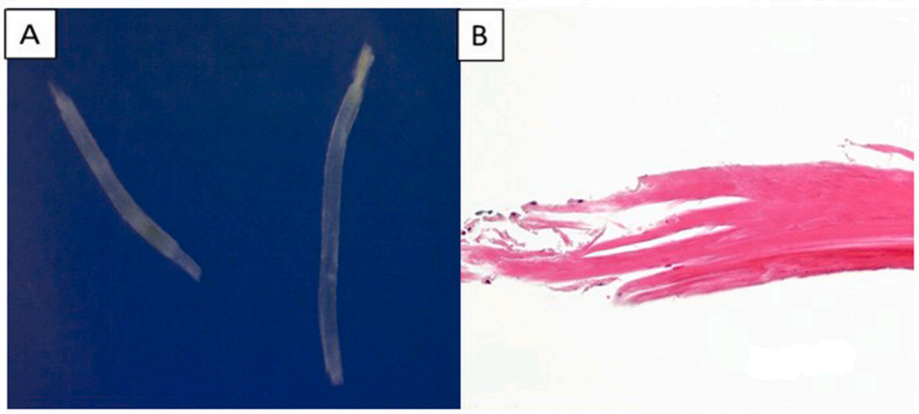

Fig. 2. Suture material, gross and microscopic findings. A. Two translucent suture fragments with frayed edges. B. The suture material is composed of a dense eosinophilic collagen with frayed edges, surrounded by few macrophages (arrow) [hematoxylin-eosin stain, ×200].

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