Canalicular laceration: the stick utilization of Veirs modified

Laceração canalicular: a utilização do bastão de Veirs modificado

Silvia Helena Tavares Lorena[1], João Amaro Ferrari Silva[2]

ABSTRACT

The authors describe the stick utilization of Veirs modified as modelling intracanalicular facilitating canaliculo suture lachrymal and avoiding its estenose. The technique consists in the stick introduction of Veirs modified in the lumen canalicular by the lacrimal point, in direction to the lachrymal sack. To follow the distal terminations and near of canaliculo hurt are identified and the lateral and medial region of the mucosa canalicular are sutured mouth to mouth, with points separated of polivicryl 8.0, letting well the wound edges, around of the stick. The wound reconstruction is completed by plans.

Mononylon thread 6.0 of the stick that is externalized by the lachrymal point will be fastened to the eyelid skin in right angle. The stick remains for 4 to 6 weeks in the canalicular lumen.

Keywords: *Lacrimal apparatus/surgery; Eyelids/injuries; Suture techniques; Case reports*

RESUMO

Os autores descrevem a utilização do bastão de Veirs modificado como modelador intracanalicular, facilitando a sutura do canalículo lacrimal e evitando a sua estenose. A técnica consiste na introdução do bastão de Veirs modificado no lúmen canalicular pelo ponto lacrimal, em direção ao saco lacrimal. A seguir as terminações distal e proximal do canalículo lesado são identificadas e a região lateral e medial da mucosa canalicular são suturadas boca a boca, com pontos separados de polivicryl 8.0, deixando bem coaptadas as bordas da ferida, ao redor do bastão. A reconstrução da ferida é completada por planos.

O fio de mononylon 6.0 do bastão que se exterioriza pelo ponto lacrimal será fixado à pele da pálpebra em ângulo reto. O bastão permanece por 4 a 6 semanas no lúmen canalicular.

Descritores: Aparelho lacrimal/cirurgia; Pálpebras/lesões; Técnicas de sutura; Relatos de casos

[1]Ph.D. Student, Lacrimal Apparatus Unit, Federal University of São Paulo (UNIFESP), São Paulo/SP, Brazil.
[2]Head of the Lacrimal Apparatus Unit, Federal University of São Paulo (UNIFESP), São Paulo/SP, Brazil.

Work conducted at the Lacrimal Apparatus Unit, Federal University of São Paulo (UNIFESP), São Paulo/SP, Brazil.

The authors declare no conflicts of interest

Received for publication: 20/10/2010 - Accepted for publication: 26/6/2011

Introduction

Canalicular laceration occurs as a result of trauma in various contexts, including domestic trauma, car accidents, sports, and dog bites.[1] A patient with canalicular laceration should undergo a complete eye examination, including tests such an orbital radiography when there is suspicion of orbital fracture or foreign bodies, and also a brain CT scan if the patient becomes unconscious. The need for tetanus prophylaxis should be assessed in all patients, and in cases of dog bites, rabies prophylaxis and the use of systemic antibiotics should be considered.[2]

Prevention of post-traumatic epiphora is based on correct diagnosis and treatment.[3,4]

It is important to repair injured canaliculi, as studies using scintigraphy have shown that the drainage of tears is made by the superior and inferior canaliculi in similar proportions.[5]

Canalicular lacerations should be operated within 12 to 48 hours to prevent tissue oedema, thus facilitating surgical handling.[6,7]

Surgical repair of canalicular lacerations is done under general anaesthesia, since local anaesthesia can distort canalicular anatomy, complicating their identification. A surgical microscope or magnifying glass is used, and it is essential to introduce a stent in the lumen of a torn canaliculus through the lacrimal punctum. Stents can be made of stainless steel or silicone.[6] Silicone stents are more frequently employed for canalicular intubation, through techniques that utilise the Crawford, Worst, and Pigtail probes.[3]

Controversy exists as to the optimal surgical technique.[3] According to the literature, satisfactory results are achieved without intubation, by suturing the canaliculus using a monofilament.[7] In the Brazilian literature, use of the Johnson wire has been described using a 30mmX7 injection needle, which prevents stenosis after canalicular laceration. The advantages of this technique are good fixation, greater availability, and low cost.[8] Other authors describe the use of a teflon catheter as an intracanalicular stent. A teflon catheter (number 22 or 24) is used in the canalicular lumen, facilitating suture. Of the 11 cases of canalicular laceration operated with this technique, 8 (72%) were successful. No intra- or postoperative complications were reported.[9]

We present a new technique that uses a modified Veirs rod to facilitate canalicular suture.

Methods

The modified Veirs rod[1] (Figure 1) is hand made from a 30mmx7 needle (22 G) following the steps below.

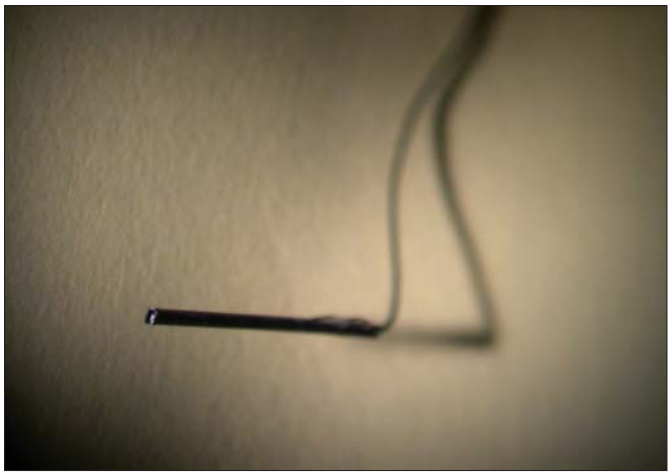

Figure 1. The modified Veirs rod

1. First, the metallic part should be separated from the synthetic part using a Kelly clamp and polishing the ends of the needle.

2. The needle thus becomes a rod measuring 11-13 mm (the modified Veirs rod).

3. A mononylon 6.0 suture is then introduced into one end of the needle and fixated with cyanoacrylate glue.

Surgical Techinique

The procedure is done under general anaesthesia, and a surgical microscope or magnifying glass should be used to identify the proximal and distal stumps of the lacerated canaliculus.

Once the stumps are identified, the lacrimal punctum is dilated (Fig. 1) and the modified Veirs rod is introduced into the canalicular lumen (Figure 2).

The superior, lateral and medial regions of the canalicular mucosa are then sutured end to end, performing separate sutures with braided polyglactin Vicryl™ (8-0). The wound edges around the rod should be well coapted. Wound reconstruction is done in planes: A continuous suture is done in the tarsal conjunctiva with polyglactin braided Vicryl™ (6-0); a separate suture is done in the muscle layer with polyglactin braided Vicryl™ (6-0); and the skin suture is done separately with black nylon monofilament 6-0 (Mononylon™).

The mononylon 6.0 suture in the rod that comes out through the punctum will be fixed to the eyelid skin with polyglactin braided Vicryl™ (8-0). The rod remains in the canalicular lumen for 4-6 weeks.

In summary, the surgical steps are:

Figure 2. Dilation of the lacrimal punctum

Figure 3. Intubating the lacerated canaliculus with the modified Veirs rod

Figure 4. Suturing the canalicular mucosa

Figure 5: Eye inspection

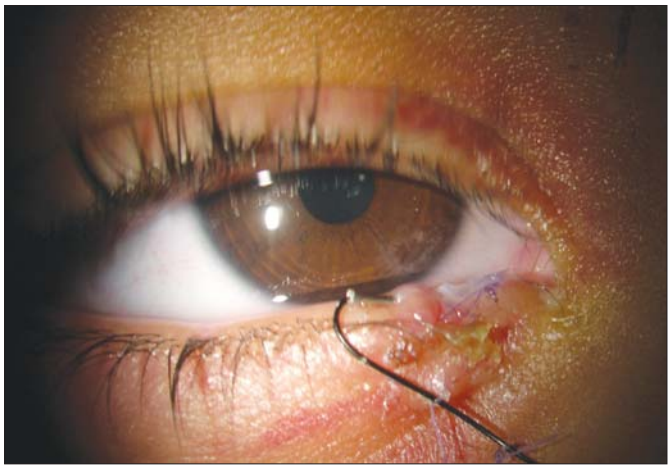

Figure 6. Introducing the modified Veirs rod into the canaliculus

1. Dilating the lacrimal punctum of the lacerated canaliculus after identifying the proximal and distal stumps (Fig. 2)

2. Introducing the modified Veirs rod into the lacerated canaliculus (Figure 3)

3. The superior, lateral and medial regions of the canalicular mucosa are sutured end to end, using separate sutures with braided polyglactin Vicryl™ (8-0). The wound edges around the rod should be well coapted.

The advantages of using the modified Veirs rod are: monocanalicular technique; prevents probing of the inferior lacrimal pathway; flat learning curve; short surgical time; wide availability; and low cost.

Case Report

JCS, 4-year-old mixed-race female born and living in São Paulo, complaining of tearing in the right eye after being bitten by a dog one day earlier. Medical history: The tearing started after the dog bite; the patient was taken to the emergency room of São Paulo Hospital, where she was hospitalised and prescribed Cephalexin 25 mg/kg every 6 hours and received rabies and tetanus prophylaxis. Ophthalmic examination showed a vision of 1.0 in both eyes, no ocular proptosis, normal extraocular movements, hyperaemia and oedema in the medial corner of the lower lid of the right eye, and canalicular laceration (Figure 5). Milder test in the RE: +++.

The child underwent surgery to correct laceration of the inferior canaliculus of the right eye 24 hours after trauma due to a dog bite; the technique consisted of canalicular intubation using a modified Veirs rod (Figure 6).

There were no intra- or postoperative complications. The modified Veirs rod remained in the canaliculus for 1 week. The patient underwent postoperative follow-up for 2 months. During this period the canaliculus remained patent, which was verified using the primary Jones test.

The Milder test was performed in the 12th postoperative day (Figure 7).

Figure 7. Milder test in the 12th postoperative day

Discussion

The materials used for canalicular intubation have been improving since the first operation for canalicular laceration described in 1913[6].

The Worst probe is used only for monocanalicular repair and is contraindicated in lesions of the common canaliculus and lacrimal sac; furthermore, it is not always available in emergency units. When used by inexperienced surgeons, this kind of probe can cause canalicular damage with the formation of false pathway.[3,6,10,11]

Remky probes are unsightly and can damage the lacrimal punctum.[6]

Crawford probes may not be tolerated by children, since the silicone stent should remain in the canaliculus for a period sufficient to heal the duct and prevent stenosis; there is no consensus as to how long the stent should remain in the canaliculus. Possible complications of silicone stents are: pyogenic granuloma, canalicular inflammation and infection, migration, nasal irritation, corneal abrasion, and extrusion of silicone in the case of bicanalicular intubation.[6,11] The main drawbacks of the Crawford probe are its low availability and high cost.

Due to the complications of the above methods, canalicular repair with the modified Veirs rod can shorten surgical time, with low cost and wide availability.

The modified Veirs rod is a metal canalicular stent made from a needle turned into a 11-13 mm rod. Its metallic part is

separated from the synthetic part using a Kelly forceps, and the needle ends are polished.

A mononylon 6.0 suture is then introduced into one end of the needle and fixated with cyanoacrylate glue.

The technique is indicated in regular, oblique, and cross-sectional canalicular lacerations. Its disadvantage is that the suture may break and the stent may be retained within the canaliculus, requiring additional surgery for its removal. No intra- or postoperative complications occurred in our study. The technique was employed in one patient, who underwent postoperative follow-up for 1 year. The outcome was excellent and the operated canaliculus remained patent.

In the Brazilian literature, use of the Johnson wire has been described using a 30mmX7 injection needle, which prevents stenosis after canalicular laceration. The advantages of this technique are good fixation, greater availability, and low cost. All patients operated with this technique had excellent outcomes.[8]

Other authors described the use of a teflon catheter as an intracanalicular stent. A teflon catheter (number 22 or 24) is inserted into the canalicular lumen, facilitating suture. Of the 11 cases of canalicular laceration operated with this technique, with an average postoperative follow-up of 6 months, 8 (72%) were successful, with canalicular patency as evidenced through clinical observation and the Jones test. No intra- or postoperative complications occurred.[9]

A greater number of procedures using the modified Veirs rod need to be evaluated to determine the actual efficacy of the technique.

References

1. Slonim CB. Dog bite-induced canalicular lacerations: a review of 17 cases. Ophthal Plast Reconstr Surg. 1996;12(3):218-22.
2. Matayoshi S, Kikuta HS. Inflamação e infecção palpebral, orbitária e lacrimal. In: Takahashi WY. Traumatismos e emergências oculares. São Paulo: Roca; 2003. p.156.
3. Jordan DR, Nerad JA, Tse DT. The pigtail probe, revisited. Ophthalmology. 1990;97(4):512-9. Comment in Ophthalmology. 1990;97(11):1399-400.
4. Loff HJ, Wobig JL, Dailey RA. The bubble test: an atraumatic method for canalicular laceration repair. Ophthal Plast Reconstr Surg. 1996;12(1):61-4.
5. Paulsen FP, Thale AB, Hallmann UJ, Schaudig U, Tillmann BN. The cavernous body of the human efferent tear ducts: function in tear outflow mechanism. Invest Ophthalmol Vis Sci. 2000;41(5):965-70.
6. Reifler DM. Management of canalicular laceration. Surv Ophthalmol. 1991;36(2):113-32. Comment in Surv Ophthalmol. 1991;36(4):323-4.
7. Adenis JP, Robin A. [A new method of canalicular surgery: monofilament sutures without intubation. Study of 23 cases]. J Fr Ophtalmol. 1982;5(8-9):515-8. French.
8. Bison S, Soccol O. Confecção artesanal de arame de Johnson. Arq Bras Oftalmol. 1998;61(5):599-601.
9. Rossi JV, Costa MN. Laceração canalicular: uma técnica simplificada de sutura. Arq Bras Oftalmol. 2003;66(3):351-4.
10. Long JA. A method of monocanalicular silicone intubation. Ophthalmic Surg. 1988;19(3):204-5.
11. Sato K, Kawai K. [Repair of canalicular lacerations using silicone tubes (80 cases)]. Nippon Ganka Gakkai Zasshi. 2002;106(2):83-8. Japanese.

(*) O bastão de Veirs modificado, "palestra proferida por dr. Zeniro SanMartin no XXXIII Simasp - Unifesp em 5 de março de 2010.