Paediatric Tongue Laceration – An Unique Repair

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ABSTRACT

Tongue laceration provides a challenge for an emergency physician with a thought to suture or not to suture, because of the behaviour of paediatric patients are of major consideration. Traditional wound closure typically involves local anaesthesia, sedative drugs, or even general anaesthesia, which are time consuming and some of them are often anxiety provoking for surgeons, patients and their parents and are also associated with other complications. N-2-butyl-cyanoacrylate has been used in this case report in the context of the emergency department for successful repair of laceration, although it is not generally used for the intraoral and mucosal surface. The case report describes the need for careful assessment of tongue laceration and alternative manner of tongue laceration repair by use of N-2-butyl-cyanoacrylate, which was less time consuming and was well accepted by the child, parents and operating surgeon. The healing was satisfactory after a follow up of one month, with minimal scar formation and no sign of infection. KEYWORDS: Tongue Laceration, N-2-Butyl-Cyanoacrylate, An Alternative To Suture, Adhesive, Emergency Department

INTRODUCTION

Paediatric tongue laceration possess dilemma to the operating surgeon to suture, not to suture or any alternative manner to approximate the wounds. Wound closure is a part of any surgical procedure and the objective of laceration repair or incision closure is to approximate edge of the wound so the natural healing process may occur.¹,²

There has been a continuous discovery for sutureless approximation of incised or lacerated wounds. Cyanoacrylates are among one of them. They carry the advantage of rapid application, patient comfort, haemostasis without provoking any anxiety for suture placement.³,⁴

In this case report a successful application of N-2-butyl-cyanoacrylate over dorsum of the tongue laceration which had shown satisfactory healing and also a promising alternative to sutures.

CASE REPORT

A 5-year-old boy presented to the emergency department of Kempe Gowda Institute of Medical Science Bangalore, with a chief complaint of pain and bleeding from the tongue after a self-fall in his residence. On general examination the patient was conscious, uncooperative, well oriented to time, place, person and situation, no history of loss of consciousness, seizures, ear, nose and throat bleed, neck stiffness or injury to other parts of the body, pulse - 74/m. intraoral examination revealed mouth opening to be 3cm, a laceration over dorsum of the tongue a slash injury 3.5 x 1cm distal to the tip of the tongue and 2 x 1 cm proximal to the tip of tongue [fig1]. There was no active bleeding or lateral border laceration but the gaping nature of the wound, made us to reapproximate it.

The child’s parent was explained about the painful nature and anxiety related to local anaesthesia and suturing. The need for repair and accompanying risk and complication of procedural sedation or general anaesthesia was also explained. However, the patients parent was not willing for the above treatment. So an alternative modality of reapproximation was to deliver as gaping of 1cm was present. N-2-butyl-cyanoacrylate was used to approximate the tongue laceration, but the parents were informed about the complication related to its use like adhesive failure, allergy. However, the parents were informed about the complication related to its use like adhesive failure, allergy. They were also willing to accept the complication related to its use like adhesive failure, allergy.

Fig 1 – tongue laceration measuring 3.5 x1 cm over mid dorsum of tongue , another laceration measuring 2 x 1 cm proximal to the tip of tongue , gaping nature of tongue wound is also seen.

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is not indicated for intraoral use. But child’s parent was willing for this treatment modality, so we took written consent from the child and his parents.

The child’s tongue was grasped with gauze, lignocaine topical spray was applied over the wound site. the lacerated site was irrigated with normal saline and betadine, the site was again dried thoroughly with gauze, wound edges were reapproximated in its anatomical site. N-2-butyl-cyanoacrylate was applied in 2 layers over the lacerated sites and allowed to dry [fig 2]. Good approximation was achieved and the child was instructed not to manipulate the closure which may cause the removal of the glue and failure of the procedure. The child was kept under observation for a day and to see that the adhesive material remains in its place, the child’s parent was instructed to return to the department if any wound dehiscence or any other complications arises. At 48 hrs wound check visit, the wound was fairly approximated with minor detachment, the parents were instructed to maintain good oral hygiene and to return if any wound dehiscence is noticed. The minor detachment was let to heal secondarily. The tongue was evaluated after 21 days, healing was excellent with minor scarring and without any complication due to the use of N-2-butyl-cyanoacrylate [fig 3].

**DISCUSSION**

Wound closure is a part of any surgical procedure. The purpose of all wound closure is to approximate the wound edge so as to facilitate natural process of uneventful healing for favourable cosmetic and functions.  

Approximation of paediatric tongue laceration requires prompt judgement skill. The most common location for tongue laceration is in the anterior dorsal of the tongue, next common location is mid dorsal and anterior ventral. A wound located in the dorsal should also be looked for any ventral counterpart, if any crown fracture of the tooth is present, the fracture fragment should be looked in the wound site. A fall in the house is the most common cause, the frequency of injury increases from anterior to the posterior region on both surfaces. Haemorrhage, disfigurement, infection, loss of function, edema which can cause airway obstruction, these are common concern in a tongue laceration.  

Andreasen and Andreasen suggest suturing of both dorsal and lateral border injuries. Powers et al. suggest loosely suturing tongue wounds and placing deep wounds in layers. Donat et al. recommend suturing only wounds larger than 2cm or when haemorrhage is concern. Touloukian warns that suturing may predispose the tongue to invasive, closed space infection. English et al. suggest that small laceration need not be sutured when margins are at good approximation. A tongue laceration should be sutured when it is gaping at rest. Patel et al. presented a case of a gaping wound over the dorsum of the tongue. Which was left alone to heal secondarily and no intervention was made, it was seen that the lacerated tongue healed excellently well and had minimal scarring. Kazzi et al. presented a case report in which he showed successful closure of paediatric tongue laceration in a 10 yrs old child with 2-octyl cyanoacrylate. Tongue has a rich vascular supply, primary healing occurs once the 2 lacerated edges are approximated under local anaesthesia or general anaesthesia. Administration of antibiotic and analgesics if required, oral hygiene instruction should be given as chances of infection are utmost due to oral microflora. It was studied that suturing a tongue laceration does not improve the outcomes or morbidity associated with the type of injury.

The most commonly used method for closing lacerated tongue wound is suturing. It has various advantages like careful closure, good tissue approximation, highest resilient strength, lowest dehiscent rate. However, it has some disadvantages like requirement of anaesthesia, associated needle prick injury general tissue reactivity, higher cost, more time consuming, need for suture removal. Over past 3 decades, new biomaterial has been discovered which can replace conventional suture material like staples, adhesive strips, and tissue adhesives.
Tissue adhesives like cyanoacrylate have come a long way in the management of wound closure but still its use in the tongue laceration are very rare, only one case report have been previously documented in the literature, but not a single case report is present in which N-2-butyl-cyanoacrylate is used for closure.

The purpose of the indexed case report is to highlight the treatment modality of paediatric tongue laceration with N-2-butyl-cyanoacrylate in an emergency department and to assist the surgeon in the management of this unique and highly specialized area of traumatology.

Cyanoacrylate includes short chain (methyl, ethyl) and longer chain (butyl, isobutyl, isoacyrl, octyl-cyanoacrylate derivatives).

Cyanoacrylates were first recognized to have adhesive properties by Coover in 1959. Their formula is CNCH2=COO-R where R is side chain. Some authors have reported the clinical use of cyanoacrylate with several advantages like the ease of application with shorter operative time, formation of a protective barrier, painless application, no apprehension by patient and their care takers. Disadvantages include reduced tensile strength, avoided over areas subjected to frequent moisture and friction such as heels and palm, infected wounds, immunocompromised patients and patients with known allergy to cyanoacrylate and formaldehyde.

Studies conducted by Kumar MS et al. made a comparison between silk suture and N-butyl-2-cyanoacrylate in closing surgical site incisions, and it was found that the use of cyanoacrylate glue has resulted in less postoperative inflammation, good clinical and histological healing when compared to the silk sutures. The sutured wound in oral cavity possess more chances of infections due to deposition of plaque and food debris, sometimes the wound debris is not up to the mark and can cause fistulation and granuloma formation, which can also result from incompatibility of suture material perse.

Studies conducted on animals intraoral application of cyanoacrylates have been successful and are safe and suitable without any significant difference in liver and kidney functions.

On an economical point of view after comparing non absorbable suture, absorbable suture and cyanoacrylate, it was found that cyanoacrylate was cost effective over facial laceration.

CONCLUSION

In particularly young children behaviour management needs to be seriously considered as sedation or general anaesthesia may be required to place suture which has other disadvantages so an alternative means of tongue laceration closure with tissue adhesive like N-2-butyl-cyanoacrylate could be a treatment modality which has good cosmetic outcome, minimal scarring, and good paediatric patient cooperation. Closure of wounds without the need for suture material will be a major advancement, an opportunity to improve care, especially in children and reduced pain caused by suture needle prick.

REFERENCES


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