***Case report***

**RECONSTRUCTION OF A LARGE UPPER EYELID DEFECT DUE TO HUMAN BITE WITH CUTLER-BEARD TECHNIQUE**

**Abstract**

Human bite injuries of the eyelid is rare, even more so bites associated with tissue loss or defect. Human bites are particularly known for their propensity to cause infections at the site of the bite injury as well as posing a potential risk for transmission of systemic diseases. We report the case of a 36 year old man that presented to our hospital 5 days after he sustained human bite injury to his right eyelids during a fight with complaints of inability to close the right eye associated with pains and blurring of vision. Examination revealed a large (65%) right upper eyelid defect, severe lagophthalmos and exposure keratopathy. The upper eyelid defect was successfully reconstructed using Cutler-Beard technique. Most reported cases of use of Cutler-Beard technique for reconstruction of large upper eyelid defects in the literature were following tumour excision. This case adds valuable insight into the versatility of this reconstructive approach in atypical and high-infection-risk scenarios of large upper eyelid defect.

Key word: Human bite, upper eyelid, defect, Cutler-Beard

**Introduction**

Full thickness defects of the upper eyelid are caused by tumour excision, trauma or congenital colobomas (Li 2018). The Cutler-Beard technique (CBT), also known as the bridge flap technique, was first introduced in 1955 by Norman Cutler and Crowell Beard to reconstruct significant upper eyelid defects where more than 50% of the lid margin is involved, and the Tenzel semicircular flap procedure is insufficient (Cutler and Beard 1955). Human bite injuries of the eyelid is rare, even more so bites associated with tissue loss or defect (Okonkwo and Ezeh 2022). Human bites are particularly notorious for their tendency to cause infection at the site of the bite injury and to pose a potential risk for transmission of systemic infection because of high load of pathogen in human saliva (Yacoub et al 2014). Most reported cases of use of CBT for reconstruction of large upper eyelid defects were following tumour excision (Hsuan and Selva 2004, Rahmi et al 2014, Bengoa-Gonzalez 2019). In this report, we highlight a rare but clinically significant cause of upper eyelid tissue loss: human bite injury, and its successful management using the Cutler-Beard technique. While CBT is well-established for reconstructing post-tumor excision defects, its application in traumatic eyelid loss due to human bite is scarcely reported**.**

**Case presentation**

A 36 year old man presented to our hospital 5 days after he sustained human bite injury to his right eyelids during a fight. He complained of inability to close the right eye associated with pains and blurring of vision. On clinical examination, his visual acuities were 6/18 and 6/6 on the right and left eye respectively. There was approximately 65% full thickness loss of the right upper eyelid margin involving the entire lateral and part of middle third of the upper eyelid with resultant lagophthalmos and exposure of the cornea (Figure1A). There was central cornea epithelial erosion (exposure keratopathy) evident on fluorescein staining (Figure 1B. The upper eyelid defect extends approximately 27 mm horizontally (including a 7 mm lateral extension from the lateral canthus) and 11 mm vertically from the eyelid margin. There was also a full thickness laceration wound on the lateral third of the lower eyelid. The rest of the ophthalmic examination findings of both eyes were within normal limits. The patient was admitted and worked up for surgical reconstruction of the right upper eyelid under general anaesthesia. As part of preparation for surgery, written consent was obtained and routine haematological test were done on him and all results were within normal limits.



Figure 1 Patient at presentation (A) Large upper eyelid defect extending lateral to the lateral canthus (B) Severe lagophthalmos. Also visible is central cornea epithelial erosion stained with fluorescein dye

Preoperatively he was started on broad spectrum antibiotics tablets Augmentin 1000mg twice daily, tablets metronidazole 400mg thrice daily and an analgesic tablets ibuprofen 400mg twice daily. Eye drops methylcellulose hourly right eye and ointment chloramphenicol noctate to protect the exposed cornea from further desiccation and ulceration. He was also given tetanus toxoid injection because he was not sure of his immunization status. At surgery after routine cleaning with 10% povidone iodine and draping, the wound was thoroughly irrigated with normal saline and debrided. The upper eyelid defect was then reconstructed using Cutler-Beard technique which involves a two stage full thickness advancement flap from the lower eyelid. Stage one: The full thickness lower eyelid laceration was first sutured using 6/0 vicryl. The upper eyelid defect was measured with calipers and marked out on the lower eyelid medial to the lower eyelid margin laceration. A full thickness (cutaneo-myo-conjunctival) horizontal incision was made 2 mm below the inferior border of the lower eyelid tarsal plate. The two vertical limbs of the flap were inferiorly directed to the conjunctival fornix. The flap was then advanced under the bridge of the inferior eyelid margin. Conjunctiva, muscle and skin of the lower eyelid flap were sutured to their equivalent on the upper eyelid defect using 6/0 vicryl in an interrupted fashion. A myo-cutaneous flap was then raised lateral to the lateral end of the upper lid defect and advanced medially and sutured to the lateral border of the bridge flap to reconstruct the lateral canthus (Figure 2). Second stage: After 7 weeks, the Cutler-Beard bridge flap was divided. The division was made at a level about 1.5 mm below the desired height of the new upper lid margin with the scissors angled in such a way that the conjunctiva was longer than the skin. This extra 1.5 mm segment help to prevent potential post-operative eyelid retraction. The upper eyelid conjunctiva was then advanced anteriorly onto the newly created upper lid margin for about 2 mm with running 6/0 vicryl to create anteriorly located myo-cutaneous junction. This is to minimize the chance of keratinized skin from the new upper lid margin causing keratopathy. The granulation tissue of the lower lid bridge was then denuded using size 15 blade and the superior edge of the flap was attached to the bridge using 6/0 vicryl. Antibiotic ointment was then applied to all the surgical sites.

At 4 weeks follow up, the cornea epithelial erosion have healed completely and visual acuity on the right eye was now normal. There was no lagophthalmos and the eyelids closed and opened normally. The patient was quite happy with the outcome (Figure 3).



Figure 2. Appearance of the upper eyelid defect after first stage reconstruction with Cutler-Beard technique (A) At one week (B) At 7 weeks



Figure 3. Appearance of the reconstructed large upper eyelid defect one month after second stage of Cutler-Beard procedure. (A) Good eyelid opening (B) Good eyelid closure. No lagophthalmos

**Discussion**

Human bites are serious injuries that may result in infection, loss of function and gross disfigurement as seen in this case. Infection from oral contaminants, tissue damage and difficult surgical reconstruction make the management of human bites injuries a challenge (Okonkwo and Ezeh 2022). Key steps towards infection control following human bite include antibiotics therapy to prevent or treat infection, cleansing of the wound and copious irrigation with saline, 1% povidone iodine or tap water at body temperature. This should be followed by debridement of devitalized tissue if required.

Bites to the eyelids is rare but can pose a particular threat in terms of eye closure and corneal protection as seen in this patient. The primary goal of eyelid reconstruction is to restore eyelid structure and function, achieve a cosmetically acceptable appearance with minimal surgical morbidity, and, more importantly, maintain ocular surface homeostasis to prevent visual impairment (Cervatiuc et al 2023).

The Cutler-Beard technique has proved to be a suitable way of meeting these goals because the flap provides a perfect integration into the recipient bed (Bengoa-Gonzalez et al 2019). The challenges of surgical reconstruction of eyelid defect following human bite depend on the fullness and extent of tissue loss and whether or not the avulsed part is available for reconstruction. In this case the avulsed part of the eyelid was unavailable for reconstruction at time of surgery. We reconstructed the avulsed defect of the upper eyelid using Cutler- Beard advancement bridge flap from the lower eyelid. Advantages of this technique include optimal color match due to similarity of the flap to missing skin in color and its good vascular supply essential for successful flap survival and tissue healing (Beri et al 2022). Furthermore the flap is usable for the reconstruction of nearly all forms of superior eyelid defect of more than 50% (Rahmi et al 2014). However, a disadvantage of the CBT is the prolonged occlusion of the eye (6 to 8 weeks) during the healing period (Beri et al 2022, Wilhem et al 2025). For this reason it is not a preferred option for reconstruction of large upper eyelid defects in individuals with monocular vision as well as young children (less than 7 years) due to its potential to cause occlusion induced amblyopia (Beri et al 2022). Another disadvantage of CBT is the absence of eyelash on the reconstructed upper eyelid. This can be addressed with the use of artificial eyelashes (Rahmi et al 2014).

 **Conclusion**

Although rare, human bite eyelid injuries are potentially dangerous wounds and can constitute a significant cause of morbidity. The Cutler-Beard advancement flap is a useful technique in the reconstruction of select cases of human bite injury involving the eyelids with significant tissue defect.

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