

PRIMENA DERMABOND® KOŽNOG LEPKA U REKONSTRUKCIJI POVREDA KOŽE KAPKA

THE APPLICATION OF DERMABOND® SKIN ADHESIVE IN THE RECONSTRUCTION OF THE EYELID INJURY

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Kratak sadržaj

U radu je prikazana primena octyl-2-cyanoacrilatnog (Dermabond®) kožnog lepka poslednje generacije iz grupe cianoakrilata. U rekonstrukciji razderne povrede kože gornjeg kapka, kod pacijentkinje ženskog pola, starosti 71 god., za fiksaciju kože rekonstruisanog kapka, tri puta je nanesen Dermabond® kožni lepak. Postignuto je primarno spajanje rane a postoperativni estetski i funkcionalni rezultat je posle deset dana bio izvrstan. Pacijentkinja je intervenciju podnela odlično. Nisu primećeni znaci zapaljenja ili infekcije na mestu gde je rana spajana Dermabond® kožnim lepkom.

Ključne reči: razderne povrede, koža, kapak, Dermabond®, lepak

Summary

The paper presents the application of octyl-2-cyanoacrylate (Dermabond®) skin adhesive of the last generation of cyanoacrylates. In the reconstruction of the upper eyelid laceration, in the female patient of 71 years of age, the Dermabond® skin adhesive was applied three times for the skin fixation of the reconstructive eyelid. The primary wound binding was achieved, and after ten days, the post-operative and esthetic results were excellent. The patient underwent the operation quite well. The signs of inflammation and infection were not noticed at the place of wound binding by Dermabond® skin adhesive.

Key words: laceration, skin, eyelid, Dermabond®, adhesive

Uvod

U hiruškoj praksi se više od dvadeset godina sprovode istraživanja kako bi se pronašla zamena za spajanje tkiva šavovima. Sredinom XX veka u hirurgiji su počela istraživanja za primenu cijanoakrilatih - polimernih tkivnih adheziva (lepkova) za bezšavno spajanje tkiva i kože. Klinička primena N-butyl-2-cyanoacrilata (Histoacril®, B. Brown Medical Inc., Scheffield, England) je počela 70-ih godina prošlog veka.¹ Histoacril® tkivni lepak pokazao je malu tkivnu toksičnost, dobru snagu spajanja tkiva i pružao je zadovoljavajući estetski efekat. Histoacril je imao neobične hiruške indikacije i koristio se

Introduction

For more than twenty years of surgical practice, there have been researches aiming at finding replacement for binding tissues with sutures. In the middle of XXth century the field of surgery was marked by investigations into the application of cyanoacrylate - polimer skin adhesives. Clinical application of N-butyl-2-cyanoacrylate (Histoacril®, B. Brown Medical Inc., Scheffild, England) started in the 70-ies of XXth.¹ Histoacril skin adhesive has proved little tissue toxicity, proper tissue binding strenght, as well as a satisfactory esthetic effect. Also, it had some unusual surgical indications and was used

kod graftovanja koštanog i hrskavičavog tkiva, popravku slušnih koštica, embolizaciju gastrointestinalnih ulcera, za embolizaciju u neurovaskularnoj hirurgiji itd.²

Octyl-2-cyanoacrilat (Dermabond®) je kožni lepak poslednje generacije iz grupe cianoakrilata koji pokazuje manju toksičnost i skoro 4 puta veću snagu spajanja tkiva nego Histoacril®. Posebna supstanca (plasticizers) je dodata Dermabondu® da bi on bio elastičan dok maksimalnu snagu spajanja ivica rane postiže posle dva i po minuta od nanošenja.³

Dermabond® je počeo da se koristi u SAD sredinom 90-tih^{4,5} a na našoj klinici od 2000. godine. U ovom radu je prikazana primena kožnog lepka Dermabond® pri spajanju i fiksaciji razderne povrede kože gornjeg kapka.

Prikaz slučaja

Pacijentkinja J.S., stara 71. g., primljena je kao hitan slučaj u našu kliniku zbog zadobijenih povreda gornjeg desnog kapka. Po prijemu su uzeti anamnestički podaci koji su ukazivali da se povreda dogodila slučajno. Pacijentkinja se u toku rada u svojoj bašti okliznula i nabola na vrh štapa koji pridržava cveće u bašti. Posle urađenog kliničkog pregleda ustanovljeno je da se radi o razdernoj povredi kože (dimenzije 18x7) gornjeg desnog kapka. Povreda je po dubini bila do kružnog mišića oka ali bez povrede sadržaja očne jabučice (slika 1). Pacijentkinja nije imala pozitivnu anamnezu na hronične internističke



in bone and cartilage tissue grafting, repairment of minor hearing bones, in gastrointestinal ulcer embolization, embolization in neurovascular surgery.²

Octyl-2-cyanoacrylate (Dermabond®) is skin adhesive of the last generation of the group of cyanoacrylates showing lesser toxicity and four times greater strenght of tissue binding when compared to Histoacril. The special substance (plasticizers) was added to Dermabond® to make it elastic. The maximal strength in binding wound edges was achieved in 2.5 min on the application.³

The first time Dermabond® was used in USA was in the mid-nineties,^{4,5} and we, at our clinic, have been using it since 2000. This paper presents the application of Dermabond® skin adhesive in binding and fixation of the upper lid skin laceration.

Case report

The patient J.S., 71 years of age, was admitted at our clinic as an urgent case because of the upper right eyelid injury. On admission we took anamnestic data which revealed that the injury was inflicted accidentally. While working in the garden, the patient slipt and fell on the top of the stick supporting flowers. Having done the clinical examination, we registered a skin laceration (dimensions: 18x7 mm) of the upper right eyelid. Regarding depth, the injury reached the orbicularis oris muscle, but there was no any injury of the eyeball content (Figure 1). The patient had no positive history of chronic internistic dis-

Slika 1. Razderna povreda kože gornjeg kapka

Figure 1. Upper eyelid laceration wound

bolesti, nije gubila svest i stigla je u našu kliniku dva sata od povrede. Zato je odlučeno da se odmah pristupi rekonstrukciji kapka i to bez lokalne anestezije. Posle toaleta rane i minimalnog debridmana ivica rane kao i hemostaze, delovi kože kapka vraćeni su na početnu, anatomska poziciju. Za fiksaciju kože korišćen je kožni lepak Dermabond® (Ethicon Inc., Somerville, NJ, USA) (slika 2). Oko je izolovano ga-



Slika 2. Ampula kožnog lepka Dermabond®

Figure 2. Dermabond® skin adhesive ampule

zom a pacijentkinji je rečeno da stalno drži oko zatvoreno dok se cela procedura ne završi. Ampula sa Dermabond® lepkom polomljena je van glave pacijentkinje, zatim je nežno pritisnuta ampula sve dok se lepak nije pojavio na vrh tampona na ampuli. Nanesen je jedan sloj Dermabond® lepka preko delova kože kapka koji su prethodno vraćeni na prirodnu poziciju. U razmaku od pola minuta dva puta je nanesen po jedan sloj lepka na kožu kapka. Posle 2–3 minuta kapak je bio rekonstruisan (slika 3). Pacijentkinja je posle intervencije mogla no-

ease, did not lose consciousness and came to our clinic two hours on gaining injury. That is why we decided to perform the eyelid reconstruction without local anaesthesia. Having done the wound toilette and minimal wound edges debridmant as well as hemostasis, parts of the eyelid skin were restored to their normal, anatomic position. For the skin fixation we used Dermabond® skin adhesive (Ethicon Inc., Somerville, NJ, USA)

(Figure 2). The eye was protected by gauze and the patient was told to keep the eye closed until the whole procedure was done. The Dermabond® skin adhesive ampule was opened away from the patient's head. Then it was squeezed gently until the content appeared on the tamponade top. One layer of Dermabond® skin adhesive was applied over the eyelid skin parts which were previously returned to their natural position. In intervals of half a minute, one layer of skin adhesive was applied on the eyelid skin two times respectively. 2–3 min after, the eyelid was reconstructed (Figure 3). After



Slika 3. Izgled gornjeg kapka posle rekonstrukcije i spajanja ivice rane sa Dermabondom®

Figure 3. Upper eyelid appearance after reconstruction and fixation with Dermabond®



Slika 4. Izgled gornjeg kapka 10 dana posle spajanja ivice rane sa Dermabondom®

Figure 4. Upper eyelid appearance 10 days after reconstruction and fixation with Dermabond®

imalno da otvara oči. Rekonstruisani kapak je imao normalnu pokretljivost. Nikakvi zavoji kao ni postoperativna toaleta rane nisu primenjivani. Pacijentkinja je dobila instrukcije da može da održava higijenu lica ali da blago i pažljivo vlaži povređeni kapak. Takođe, pacijentkinji je ordinirana antibiotska zaštita cap. palitrex 500 mg na 6 sati (ICN Galenika, Beograd, Srbija) kao i anti-tetanus zaštita, s obzirom na nastanak povrede. Zakazani su joj regularni pregledi svaki drugi dan. Posle deset dana kod pacijentkinje nije primećena infekcija kao ni reakcija kože na lepak. Postignut je izvrstan estetski rezultat (slika 4), a funkcionalno su pokreti kapka bili identični sa suprotnim, zdravim kapkom (slike 5 i 6).

the intervention, the patient could open her eyes normally and the reconstructed eyelid was of normal movability. No bandages as well as post-operativ toilette were applied. The patient was instructed to maintain face hygiene with gentle and careful wetting and wiping of the injured eyelid. Also, the antibiotic therapy was administered to the patient – palitrex 500 mg per six hours, (ICN Galenika, Beograd, Srbija) as well as anti-tetanus protection, considering the nature of injury. Regular control examinations were appointed every other day. After ten days neither infection nor skin reaction to adhesive were noticed. An excellent esthetic result was achieved (Figure 4) and the functional eyelid movements were identical to the movements of the opposite, healthy eyelid (Figures 5 and 6).



Slika 5. Izgled rekonstruisanog kapka pri otvorenom oku

Figure 5. Appearance of reconstructed eyelid with open eye



Slika 6. Izgled rekonstruisanog kapka pri zatvorenom oku

Figure 6. Appearance of reconstructed eyelid with closed eye

Diskusija

U ovom radu, primenom Dermabond® lepka u rekonstrukciji razderne povrede kože gornjeg kapka, postignuto je primarno zarastanje razderne rane kože gornjeg kapka. Konvencionalni tretman kod povreda, kao u ovom radu, podrazumevao bi ušivanje rane po slojevima brzo vezujućim cat-gatom i kože sa atraumatskim koncem 5-0. Kao zamena za ovakav postupak primenjen je bezšavni postupak spajanja ivica rane i postignut je iznenađujuće dobar estetski i funkcionalni efekat. Ovakav rezultat

Discussion

In this case, by application of Dermabond® skin adhesive in the reconstruction of the upper eyelid laceration, we achieved the primary healing of the upper eyelid laceration. Conventional treatment of an injury would presuppose wound suturing through layers with fast-binding cat-gut and skin suturing with atraumatic suture 5-0. As a replacement of this procedure we carried out the one of suturing wound edges but without stitches. We achieved suprisingly good esthetic and functional results which can be explained

se može objasniti dobrim fizičko-hemijskim svojstvima octyl-2-cyanoacrilata. Dermabond® lepak se nalazi u formi tečnog monomera.⁶ Kada tkivna tečnost kože dođe u kontakt sa monomerom, ona izaziva njegovu promenu u polimer koji brzo vezuje površinu epitelnih površina tako što pravi cianokrilatni most. Na ovaj način je površina rane prekrivena polimerom nepropusnim za vodu, a ispod površine rane odvija se normalna epitelizacija. U ovom procesu je moguće da se razvije toplota koju pacijenti mogu da osećati ali je ona prolaznog karaktera. Takođe, Dermabond® lepak sadrži supstancu koja mu daje plastičnost, tako da su pokreti bilo kog dela tela potpuno prirodni i bez ograničenja. Jedno od interesantnih svojstava Dermabond® lepka je njegov antibakterijski efekat koji je primećen u ovom radu.⁷ Dermabond® kožni lepak izaziva manju reakciju u tkivu nego šav rane sa cat-gutom.⁸ U odnosu na konvencionalni šavni materijal Dermabond® lepak ima posle 2–3 minuta snagu spajanja tkiva kao rana sedmog dana posle ušivanja.⁵ Pozitivni rezultati u opisanom slučaju nisu iznenađujući s obzirom da su Green i saradnici⁸ objavili prospektivnu kontrolisanu studiju o primeni Dermabonda kod blefaroplastika. Rezultati studije su pokazali odsustvo dehiscencija, infekcija, alergijskih reakcija i izvrsna svojstva Dermabonda®, uz istovetan kvalitet spajanja kože kao i sa 6-0 koncem (polipropilen).

Klinička primena Dermabond® kožnog lepka u odnosu na šavove kod zatvaranja rana u hirurgiji lica ima perspektivu jer Dermabond® lepak: postiže maksimalnu snagu spajanja tkiva posle 2½ minuta; ima jačinu spajanja tkiva kao rana sedmog dana posle ušivanja; može da bude nanesen bez anestetika; smanjuje vreme same intervencije; otporan je na vodu i ne zahteva previjanje; ima antibaktericidno delovanje; ne zahteva uklanjanje šavova i pacijenti ga izvrsno prihvataju. Indikovano je i u dečijoj traumatologiji kože.

by proper physical and chemical properties of octyl-2-cyanoacrylate. Dermabond® adhesive is in a form of liquid monomer.⁶ When tissue fluid gets in contact with monomer, it causes its change into polymer binding the epithel surface rapidly and forming a cyanoacrylate bridge. In this way, the wound surface is covered with waterproof polymer, with normal epithelization below the wound surface. Also, there is heat developing in this process, experienced by the patient, but is of transient character. Dermabond® adhesive contains the substance providing plasticity, so the movements of any part of the body are natural and unlimited. One of the interesting Dermabond® adhesive properties is its antibiotic effect noticed in this procedure.⁷ Also, Dermabond® skin adhesive causes lesser tissue reaction than a wound sutured with cat-gut. Compared to conventional suturing material, Dermabond® adhesive binding strength after 2–3 min is equal to the binding strength of the sutured wound after 7 days.⁵ Positive results described in this case are not surprising considering Green et al. publication of prospective control study on Dermabond® application in blefaroplastics.⁸ The study results showed absence of dehiscensions, infection, allergic reaction as well as presence of excellent Dermabond properties and identical quality of skin binding as 6-0 suture (polypropilen).

In comparison to suturing wound, clinical use of Dermabond® skin adhesive has prospects because of the following properties: it achieves maximal strength of tissue binding after 2.5min, it has tissue binding strength as a sutured wound after 7 days, it can be applied without administering antibiotic therapy, it can be applied without anaesthetics, it decreases duration of the intervention, it is waterproof and does not require bandaging, it has antibiotic effect, it does not require removal of stitches and patients adjust to it very well, it is also indicated in pediatric skin traumatology.

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