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RESEARCH ARTICLE

FACIAL WOUND ASSESSMENT KIT

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Abstract

Facial wounds are a frequent reason for emergency room visits. The goals of laceration repair are to achieve hemostasis, avoid infection, restore function to the involved tissues, and achieve optimal cosmetic results with minimal scarring. Therefore, these cases are most appropriately managed by plastic surgeons who have a thorough knowledge of anatomy, aesthetic sense, and meticulous expertise in atraumatic tissue manipulation, combined with the surgical skill to repair any structure. You need to know what to do and what not to do : whether to suture or leave open. What local anesthesia to use and how. What equipment to use (and have it available beforehand). Whether to give antibiotic therapy and what kind. How to avoid aesthetic or functional after-effects. Which dressing to use depending on the state of the wound. This article will serve as an aid to wound management and review repair techniques for high-risk areas of the face.

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Introduction:-

Facial wounds are the most frequent facial emergency. They often occur in the context of polytrauma and the management must be multidisciplinary. Road accidents are the main cause. They affect all ages and all sexes but seem to be the prerogative of young males. The face consists of several organs and aesthetic units. The final outcome depends on initial wound care and primary repair. Some of the important cosmetic results we have to focus on as plastic surgeons are wounds of the face. And the very important part of our job is to get this patient the best result. This book is primarily intended to be practical and to help medical students and physicians around the world in their daily practice.

Initial Assessment:

Facial wounds can be isolated or occur as part of a polytrauma. Depending on the lesions, the order in which they should be treated should be determined in agreement with the care teams, without delaying the repair of facial wounds too much on the pretext that other more urgent pathologies have priority in the course of treatment. The date, time, mechanism of occurrence and causative agent, and time since trauma are noted.

The examination of the face should be done in a room with appropriate lighting to determine the number, size, shape, location, and appearance of the wounds. An oral and eyeball examination should be performed as well as a

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search for lacrimal wounds. A diagram and photographs should be taken. An assessment of tetanus vaccination status is required [1]. (table 1)

Table 1:- immunization against tetanus in case of a wound.

Complete vaccination with last booster less than 5 years ago	Nothing
Complete vaccination and more t han 5 years since the last booster	Vaccine reminder
Complete vaccination and time to last booster greater than 10 years, or if incomplete vaccination	Immunization booster and 250U immunoglobulin
Absent or questionable immunization, elderly, substance abuse, HIV	Vaccine and immunoglobulin 500U

If the wound is clean, without infectious signs and risk factors, antibiotic therapy is not required.

If the wound is contaminated without clinical or general infectious signs but with infectious risk factors: for a heavily contaminated wound, Penicillin M is given, in the case of an associated open fracture with cartilage, tendon, or joint exposure, second generation cephalosporin is given, in the case of contact with soil, diabetes or other infectious risks related to the terrain, amoxicillin associated with clavulanic acid is prescribed. Antibiotic therapy will be continued for three to seven days and there is no need to take systematic bacteriological samples right away.

If the wound is dirty and infected, a sample must be taken while leaving the wound open under twice-daily dressings.

Material:-

Instrumentation:

Instrumentation that must be ready before any procedure: Blades n° 11 and 15, straight and curved pointed scissors, fine dissecting forceps type Adson 12cm with claws, fine hemostasis forceps type Halstead curved 12 cm, single and double hooks, fine needle holder, a curette, two retractors, syringes with screw tip of 2.5 or 5 cc. Microsurgical instruments and microscope as needed.

The threads:

The available threads are classified as absorbable/non-absorbable, natural/synthetic, monofilament/braided. Braided sutures are easy to handle and have good knotting qualities. However, bacteria can enter the braids and escape phagocytosis and can lead to infection. Monofilaments cause much less tissue reaction and glide easily through the tissue. [2]

Non-resorbable sutures are used to suture the skin. These are nylon or polypropylene monofilaments of varying caliber depending on the type of suture and the site of the wound: for the face (6/0) and where the skin is thicker (5/0, 4/0). Absorbable sutures are used for the deep planes (muscles and subcutaneous tissues): 4/0 and 5/0. They are resorbed in two to three months. [3]

Rapidly resorbing sutures are used for intradermal surgeries, which makes their use exceptional in traumatic wounds because of the risk of infection, which may require the release of a few stitches. In addition, their resorption time is about ten days, which, for separate stitches, would result in a more marked scar than with stitches removed after five or seven days, depending on the type of suture and skin. [4]

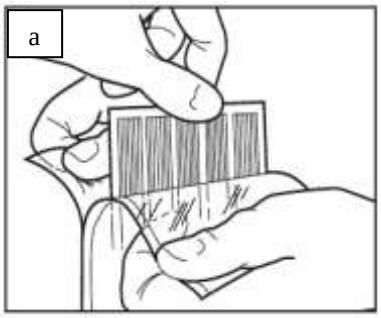
The most commonly used needle body is the 3/8 circle, triangular section 9 to 13 mm.

Alternatives to suture:

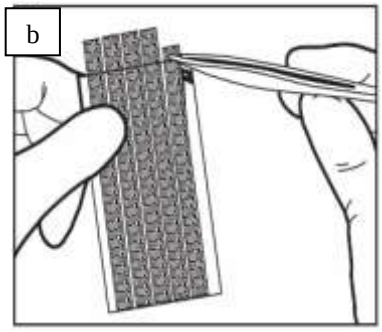
Adhesive sutures are easy, painless, and are performed without the need for anesthesia [5]. They are microporous strips that allow the passage of gas and water from the surface of the skin, making the environment unsuitable for bacterial proliferation, thus reducing wound infections [6]. They are used for small, dry superficial wounds with clean edges that do not bleed. They should be avoided in mucous membranes and areas that retain moisture [7].

They are placed perpendicular to the scar and left in place for one week. They should be placed correctly and without tension [8]. Their use is also indicated as a complement to the skin suture and also after the removal of the stitches.

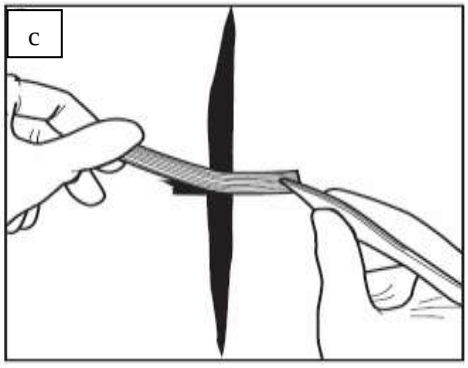
Figure 1:- How to apply adhesive strips [8][20].



1-a : Clean and dry skin at least 5cm around wound then peel back package tabs to access the sterile strip.



1-b : Remove card, using sterile precautions as necessary.



1-c: Wound closure generally starts at the middle of the wound.
Closures must be applied without tension. The rest of the wound should be closed with additional Strip closures spaced approximately 3mm.

The skin glue forms a transparent and flexible adhesive film on contact with the skin. It can be used on wounds of limited size, less than 10 cm, not requiring suture of the deep planes and without excessive tension, on frank, linear, not bleeding wounds. To apply it, the eye must be protected with a gel or a compress. The application must be done in a very thin layer, taking care to bring the edges together so that the product does not penetrate the wound, which would prevent healing. The skin must not be in contact with the end of the tube, otherwise, its orifice will be blocked. After the first layer has dried, reinforce by applying thicker layers of glue that extend well beyond the sides. It can be removed like a film on the 8th day. [9]

Anesthesia:

Lidocaine hydrochloride is the most commonly used local anesthetic. For adults, the maximum dose should not exceed 400 mg. For children, the dose used should be between 2 and 7 mg/kg. The contraindications to its use in local or locoregional anesthesia are: recurrent porphyria, taking beta-blockers, hypersensitivity to Lidocaine hydrochloride. Overdosage can cause neurological manifestations that can go as far as epilepsy or cardiac manifestations such as rhythm disorders. Overdose is treated by intravenous injections of benzodiazepines at 1mg/kg.

Vasoconstrictor catecholamines = epinephrine are often added to anesthetic solutions to reduce bleeding and improve the quality of the repair by allowing more precise surgical gestures: very used in plastic surgery. Their use should be avoided in anatomical areas whose vascularization is based solely on arterioles (e.g. nose, earlobes).

Topical anesthetics can also be used, especially in children and patients who cannot tolerate injections.

It is done after a first gentle detersion of the wound in truncular or from close to close. Repeat preferably in the already infiltrated areas by injecting very gently. Then wait five to ten minutes after infiltration. [10]

Wound cleaning and disinfection:
The cleaning is done with saline with a compressor under pressure with a syringe. If an antiseptic solution is used, it must not be stained. All devitalized tissue must be debrided conservatively. The search for foreign bodies is mandatory to avoid infection and chronic inflammatory phenomena. [11] Disinfection is done by brushing with a non-alcoholic antiseptic.

Trimming:
On the face, it is necessary to be sparing given the great vitality of the tissue. The edges are regularized and equalized to obtain a good confrontation. In oblique wounds, care must be taken to have the same height on each edge and no bacteriological sampling is systematic.

Stitches:
They are done plane by plane from the depth to the surface. The suture starts in the middle of the wound, then the other stitches are placed symmetrically until the wound is closed. The deep stitches are tied internally with absorbable thread. The last subcutaneous plane must perfectly face the edges and the skin must be sutured with a minimum of tension.

The intradermal continuous suture is reserved for linear wounds without tension and clean. The horizontal mattress technique is used for high tension wounds on fragile skin because they distribute tension along the wound edge. The vertical mattress sutures are best for the eversion of wound edges, especially in concave skin surfaces. Half buried mattress suture is ideal for triangular edge closure as it does not compromise blood supply which theoretically reduces tip necrosis.

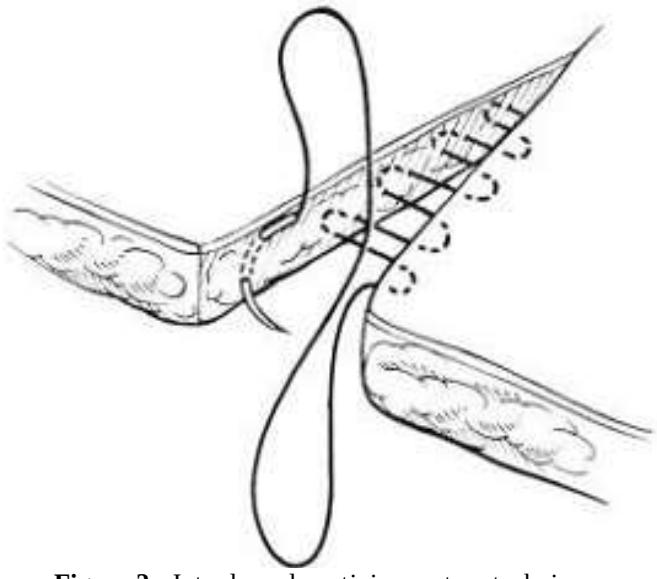


Figure 2:- Intradermal continious suture technique.

Figure 3:- Halfburied mattress suture technique.

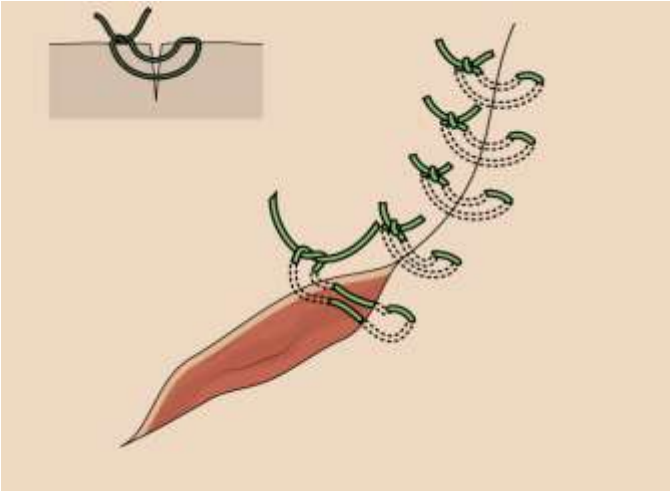


Figure 4:- Vertical mattress suture technique.

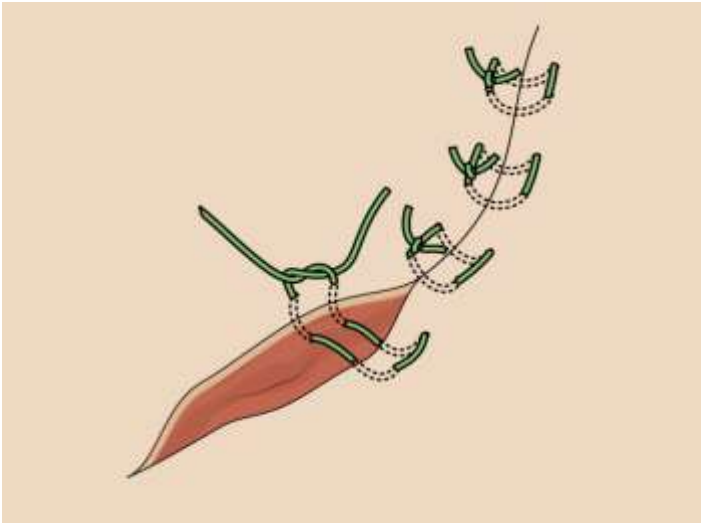


Figure 5:- Horizental mattress suture technique.

Uncontaminated wounds are closed up to 12-24 hours after wounding. Soiled wounds with a high risk of infection, wounds were seen late (the notion of delay varies between 12 and 24 hours) are not sutured. [12]

Bandages:
Sutures are removed from the face after 5 days, 3 days for the eyelids, and 7 to 10 days for the scalp. [5]

Table 2:- Dressing of open wounds.

Anfractuous wounds	Hydrocolloids. Alginates in wick Hydrocellular dressings
Exuding wounds	Alginates. Hydrocellular dressings. Hydrofiber dressings. Dressings with charcoal for detersion of infected or smelly wounds.
Bleeding wounds	Alginates
Budding wounds	Hydrocolloids. Hydrogels. Hydrocellular dressings. Fatty dressings. Corticoid ointment on a dressing impregnated with Vaseline
Epidermization	Hydrocolloids. Hydrogels. Hydrocellular dressings. Fatty dressings.

All dressings change as the appearance of the wound changes. The choice of dressing depends on the appearance of the wound, the stage of healing, the condition of the skin around the wound and the existence of an infection (table 2). After removal of the sutures, advise the patient to apply a sun protection cream on the scar for one year.

Scalp wounds :
The complexity of this region consists in the richness of its blood flow which will limit the evaluation of the initial state of the wound but also its manipulation. This region is characterized by a rich vascularization provided by three branches of the external carotid artery and two branches of the internal carotid artery, hence the interest in making direct pressure on the blood vessels. Once hemostasis is obtained, a careful reassessment is necessary to judge the condition and depth of the lesion. The layers of the scalp are from surface to depth: the skin, the subcutaneous tissue, the galea, Merckel's subaponeurotic space, and finally the periosteum. [13]

Shaving is not recommended in this area [14]. Adhesive strips can be used for scalp wound closure for wounds where there is no active bleeding, less than 10 cm long with hair length greater than 3 cm.

Topical anesthetics, local anesthesia, or locoregional anesthesia can be used on the scalp. Local anesthesia with vasoconstrictor catecholamines reduces both bleeding and pain. Loco-regional anesthesia can improve the aesthetic result since the subcutaneous infiltration could shift the margins.

The suture material that can be used: Nylon or Cutgut sizes 3-0 4-0 or also staples [15]. The choice of suture type depends on the depth of the wound. For a wound up to the galea, it is recommended to use single stitches with 4-0 non-absorbable nylon or polypropylene. For a wound involving the muscle layer: reverse stitches with 4-0 absorbable thread and for the skin single stitches with 4-0 non-absorbable Nylon or polypropylene thread.

Some elements that can help the surgeon for the removal of the threads: choose a different color of thread than the hair and leave their ends long. After suturing, a pressure bandage should be applied to prevent hematoma formation. [16]

Forehead wounds :
Their approach is similar to scalp wounds, but the scars are more apparent when there is damage to the muscles, especially the muscles of expression. For deep wounds 5-0 absorbable sutures are used and for the skin 6-0 non-absorbable sutures. Adhesive sutures may be sufficient when the deep layers are well repaired with no tension at the edges. [9]

The eyebrows should never be shaved, they are markers for the approximation of the edges and they must remain symmetrical. Here again, it is preferable to use a thread of a different color than the hair.

Eyelid wounds:
The eyelids are both functional and aesthetically important. The anatomy of the eyelid consists of 5 layers, from surface to depth: skin, subcutaneous tissue, orbicularis muscle of the eye, tarsus, and palpebral conjunctiva. The skin of the eyelid is thin and does not offer significant protection to the globe against penetration by penetrating objects.

Repair should be undertaken only after a thorough examination of the complete eye that includes assessment of visual acuity, extraocular muscle status, examination of the cornea for abrasions and/or foreign bodies, and, most importantly, the risk of globe rupture [17]. If the upper eyelid is damaged, it should be reconstructed to avoid exposure keratitis. A lacrimal duct injury should be considered for eyelid lacerations within 6 to 8 mm of the medial canthus. Superficial eyelid lacerations can be repaired with 6-0 or 7-0 nonabsorbable nylon or polypropylene sutures using separate single sutures.

Nose wounds:
The nose is made up of cartilaginous and bony structures that are separated in two by the septum. A speculum examination should be performed to detect lacerations of the mucosa, cartilage, bone and also to look for the presence of a hematoma. Any hematoma should be drained: insertion of an 18 gauge needle or otherwise make an incision and a nasal swab should be inserted after drainage with prescription of prophylactic antibiotic therapy. The possibilities of anesthesia in this area are insertion of cotton swabs or gauze pads soaked with Lidocaine and epinephrine in the nasal cavity, local anesthesia or loco-regional anesthesia.

Superficial lacerations can be closed with 6-0 non-absorbable sutures with single stitches, taking care to preserve any damaged cartilage. Deeper lacerations should be closed as follows: First, place a 5-0 nonabsorbable suture to align the wing margin skin and the skin of the nares without tying it and then manipulate the initial stitch with gentle traction to align the mucosal and cartilage layers, use a 5-0 absorbable suture to secure the mucosal layer and if necessary use a second 5-0 nonabsorbable suture to bring the cartilage closer together and finally tie the initial stitch. [18]

Lip wounds:
Four anatomical layers form the lips, from the inside to the outside: the mucosa or vermilion, the submucosal layer, the muscular layer, and the skin [19]. The aesthetic appearance of the lips depends on their different components: nasolabial fold, labiomental fold, philtrum, and mucocutaneous line.

The ultimate challenge in this area is a wound that crosses the vermilion edge. When repairing this type of wound, the first stitch must line up exactly with the edges of the vermilion and may not be tied until the rest of the laceration is repaired. Deep wounds should be closed in layers, starting with the mucosal layer and then the muscle layer. The muscular layer is closed with an absorbable suture with single stitches or U-stitches. The external mucosa with absorbable suture 4-0 separate stitches. And the skin with a 6-0 non-absorbable suture.

Figure 6:- Isolated frontal wound secondary to a fall.

Figure 7:- Eyebrow wound in a polytrauma in a young Patient.

Figure 8:- Wound in the context of an assault on an old scar.

Figure 9:- Post-traumatic wound of the temporal region.

Figure 10:- Nose wound due to a motorcycle accident.

Conclusion:-

There are many factors involved in the choice of skin closure material, including the type and location of the wound, the materials available, the surgeon's expertise and preferences, and the patient's age and health status. Repairing and restoring the function and aesthetics of the face is an important task, as the face is an important physical feature for social interactions in everyday life hence the value of a good command of this subject.

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