

# Comparing suture vs. skin adhesive for blepharoplasty closure

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## Background

Blepharoplasty is currently one of the most frequently performed facial surgeries, both for therapeutic and aesthetic purposes. As it is a surgery with aesthetic repercussions at the facial level, the surgeons who perform it have sought over the years to refine details in the technique that can improve the aesthetic result and not disrupt and even improve the patient's facial harmony. One of the surgical variants that has been introduced for this procedure are tissue adhesives such as cyanoacrylate and the like, which have shown some advantages regarding the reduction in surgical time, with minimal variations in the rate of dehiscence or infections and with very similar characteristics regarding the aesthetic result, satisfaction of the surgeon and the patient.

**Keywords.** Blepharoplasty, skin closure, skin adhesive.

**B**lepharoplasty is currently one of the most frequently performed facial surgeries, both for therapeutic and aesthetic purposes. According to the American Society of Plastic Surgeons (1), it was the second most performed facial surgery in 2020 with a total of 325,112 procedures during that year, only below nose reshaping. However, although upper eyelid remodeling surgery (blepharoplasty) is a fairly common procedure and apparently without excessive technical difficulty, it has a complication rate that ranges between 2-10% of patients (2-3) according to what is reported in world literature.

Among the mild complications, mild ecchymoses or periocular edema are mentioned, while among the more serious ones that may require reintervention or surgical revision, the removal of excess upper eyelid skin is described, resulting in difficulty closing the eye. This, in turn, can cause chronic dry eye problems and a risk of corneal injury. For this reason, conservative skin excision is recommended. Other complications include blepharoptosis (due to tarsal muscle injury), eyelid asymmetry, or blindness, which is extremely rare (4).

Given the characteristics of the procedure, as it is a surgery with aesthetic repercussions at the facial level, the plastic surgeons and ophthalmologists who perform the procedure have sought over the years to adjust details in the technique that can improve the aesthetic result of the procedure and not disrupt and even improve the patient's facial harmony. One of the innovations in this procedure that has demonstrated

some advantages over the standard procedure is the use of tissue adhesives.

## Indications and approaches

Blepharoplasty is indicated for functional purposes of the eyelid, such as epiblepharon with loss of eyelashes, dermatochalasis, blepharochalasia, as well as for cosmetic purposes. There are multiple techniques for blepharoplasty, which we can classify into non-incision methods and incision methods, including a third category that could be classified as a mini-incision. The incision technique is the one used in aesthetic procedures, while the partial incision method has the advantage of being minimally invasive and can also remove excess fat (6).

The incision technique is indicated in the presence of redundant skin or dermatochalasia, ptosis, scars on the upper eyelid, asymmetric eyelids, revision surgeries and fat prolapse (7).

## Principles of the blepharoplasty technique

The upper blepharoplasty surgical technique involves a skin pinch test to determine the amount of skin that will need to be removed. In a standardized manner, skin marking, injection of local anesthesia, incision in the skin and muscle, fat extraction, fold-forming suture at the eyelid level and the closure technique are performed (figure 1). Blepharoplasty can be performed under general or local anesthesia, based



**Figure 1. A)** Preoperative marking of the eyelid skin segment to be resected. **B)** Postoperative result using eyelid closure with interrupted 6-0 non-absorbable monofilament suture.

on patient and surgeon preference, the need for concomitant operations, and the surgical plan.

When starting blepharoplasty, an incision is made in the natural fold of the skin of the upper eyelid, which will later help us hide the scar in that same fold. The next step is to eliminate excess fat and skin. To close the upper eyelid incision, absorbable sutures, non-absorbable sutures, tissue adhesives and even adhesive bands can be used, although the benefits over the conventional suture closure technique have not been clearly identified(8-9).

**Suture vs tissue adhesives**

Given the characteristics of the eyelid skin, being one of the locations on the body with the highest healing speed, one can be relatively flexible in closure techniques without having a negative aesthetic or functional result. In most centers where the procedure is performed, a non-absorbable monofilament suture (Nylon 6-0 or 7-0) is preferred; when this is the case,

the suture material is removed after five to seven days (8, 10).

In the last decade, the use of tissue adhesives has gained relevance, mainly an adhesive made of a polymer called cyanoacrylate, which is applied to the incision once the edges have been addressed. This polymer, as well as other similar adhesives, works by improving wound closure through self-polymerization, which brings the edges of the wound closer together, favoring the re-epithelialization process (11).

Cyanoacrylate can solidify in a few seconds once it has come into contact with water and although it has demonstrated a certain degree of toxicity in contact with deep tissues, it has proven to be very useful when dealing with skin wounds, coupled with its bactericidal effect, especially against organisms. gram-positive[6, 11], which has placed it as a recurring element among US ophthalmologists since the 1970s. Another positive effect of the use of cyanoacrylate-based tissue adhesives is the shorter surgical time, as some studies have described. Perin et al., in their 2008 study, demonstrated the closure of the gap between the edges of the skin lasting from 5.3 to 8.2 minutes, with an average time of 6.9 minutes and the glue crust remaining for 7 days (9). . Similarly, Suriano et al., in 2011 compared closure with cyanoacrylate vs. intradermal suture with 6-0 absorbable monofilament, obtaining a closure time for cyanoacrylate of 6.06 minutes vs. 11.91 minutes for closure with suture, identifying a statistically significant difference in favor of the use of tissue adhesive, with a T value of 20.34 (p <0.05) (12).

Dumville et al. were more ambitious and in 2014 carried out a meta-analysis of adhesives vs sutures, in which they compared dehiscence, infection, cosmetic result, patient satisfaction, surgeon satisfaction and surgical time used for wound closure. Obtaining the results summarized in table 2.

Staggered edges (edges that are not in the same plane)	0	1
Contour irregularities (wrinkled skin near the wound)	0	1
Margin spacing (space between sides)	0	1
Edge inversion (wound not everted correctly)	0	1
Excessive distortion (swelling, edema, infection)	0	1
General appearance (subject appearance)	0	1
Total		

\*Each category on the Hollander scale is assigned a value of “0” if present and “1” if not present; For the “General appearance” category, “Poor” is considered “0” and “Good” is considered “1”. The sum of all the elements is the score; a score of 6.0 would mean an optimal result.

**Table 1.** It is possible to evaluate the cosmetic result of surgery using the Hollander wound evaluation scale. Hollander scale for cosmetic appearance\*(5)

	Skin adhesives		Suture		Tau2	Chi2	Overall	In favor of	Valor de P
	n	Eventos	n	Eventos					
Dehiscence	445	15	490	3	0,0	2,71	1,87	Sutura	0,062
Infection	460	12	517	6	0,0	2,79	1,49	Sutura	0,14
<b>Cosmetic result</b>									
Patient satisfaction	82	NA	117	NA	0,0	0,00	0,82	Adhesivos	0,41
Surgeon satisfaction	460	NA	517	NA	0,0	2,79	1,49	Sutura	0,14
Closing time	82	NA	117	NA	0,0	0,00	0,82	Adhesivos	0,41

**Table 2.** Results of the adhesives vs suture meta-analysis, Dumville, et al (13).

## Discussion

The use of tissue adhesives has evidence of improving certain parameters during blepharoplasty surgery, however, it is important to consider its costs, availability in ophthalmological or public health centers where, since it is not used routinely, its existence may be reduced or very absent, even in the days where numerous blepharoplasty procedures are performed, what is the real benefit regarding the time in the operating room. It is wise to take into account that there could be specific scenarios where the use of tissue adhesives for skin closure could offer a greater benefit to the patient than closure with sutures.

## Conclusion

Blepharoplasty is one of the most frequently performed aesthetic procedures on our continent, so it is worth knowing its variants and the resources that are available to improve times, complications and the aesthetic results of patients. Tissue adhesives such as cyanoacrylate and similar have demonstrated a reduction in surgical time, with minimal variations in the rate of dehiscence or infections and with very similar characteristics regarding aesthetic results, surgeon and patient satisfaction. Therefore, these adhesives represent a quick and safe alternative to use to close the upper eyelid during a blepharoplasty.

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