ECRONICON OPEN ACCESS

EC OPHTHALMOLOGY
Research Article

Local Anaesthesia in Oculoplastic Surgery: A Comparative Study of Two Different Techniques

Anna Laura Giacomin* and Ezio Vincenti

Ophthalmic Department of Camposampiero General Hospital, Padua, Italy

***Corresponding Author:** Anna Laura Giacomin, Divisione Oculistica Ospedale Civile Camposampiero, Via P. Cosma, Padova, Italy.

Received: February 26, 2017; **Published:** March 23, 2017

Abstract

Purpose: To compare efficacy, reliability, satisfaction and safety of a new loco-regional anaesthesia technique Vs the usual technique of local anaesthesia alone for eyelid surgery.

Methods: Two different randomly patient groups were studied. A special personality score was used in the inclusion criteria to test patient collaboration. The Group 1 included patients affected by unilateral surgical disease who were divided in a subgroup (A) treated with the new anaesthesia technique Vs a subgroup (B) treated with the usual one; the Group 2 included patients affected by bilateral eyelid disease who were treated with the two different anaesthesia techniques. The new anaesthesia technique was based on the association between neural block of supra-orbital or infra-orbital nerve and direct infiltration of tissues with a local anaesthetic mixture *ad hoc*. The usual anaesthesia technique concerned only direct infiltration of tissues with a standard mixture. Apposite scores were applied to grade satisfaction intra-operatively and postoperatively of patients. Also, judgement of surgeon was recorded.

Results: In the Group 1 no significant difference was observed regarding efficacy and satisfaction of both the patients and the surgeon. Conversely, in the Group 2 significant differences were observed in the intra-operative satisfaction scores and in the surgeon judgement: the new anaesthetic technique was superior to the old one.

Conclusions: The new anaesthetic technique combining neural block to local infiltration appears to offer a better satisfaction of the patients intraoperatively and postoperatively and more suitable surgical conditions.

Keywords: *Local Anaesthesia; Oculoplastic Surgery; Plastic Surgery*

Introduction

The main purpose of all anaesthesia techniques is to produce the most possible painless operation, without stressing emotions for the patient. A complete safety is obtained with a local anaesthesia more than with a general anaesthesia. However, it is important to avoid any pain on injection if a local anaesthetic is used. Further advantages of regional anaesthesia for ophthalmic plastic procedures include a reduction in turnover time, a lower incidence of nausea and vomiting, and less sedation and hence earlier discharge [1,2]. The common way to perform anaesthesia in ophthalmic plastic surgery operations lasting approximately 30-60 minutes is a local anaesthesia technique: repeated infiltration of the needle under the skin and/or conjunctiva to block the nerve endings of the lid tissues are usually provided.

The needle should preferably not enter the deeper tissues as this increases the risk of haemorrhage. The discomfort for the patient during infiltration can be reduced by adding Sodium Bicarbonate in the anaesthetic solution to alkalinize the acid mixture containing epinephrine. The anaesthetic solution with Sodium Bicarbonate grows in its volume and becomes cloudy forming Calcium Carbonate, a poorly soluble compound.

Moreover, finishing the effect of the local anaesthesia many patients feel pain in the postoperative period [3,4]. Loco-regional nerve blocks are often used to supplement local infiltration when deep surgery is undertaken. In eyelid surgery, local anaesthesia may be superimposed to regional anaesthesia, performed on the supra-orbital and infra-orbital nerves (the ophthalmic and maxillary divisions respectively of the fifth cranial nerve). In our experience, the anaesthetic block of the supra or infra orbital nerve before local anaesthesia is almost painless and allows to avoid the alkalization of the solution, to obtain a better control of the postoperative discomfort or pain.

Therefore, the main aim of the present study was to compare efficacy, reliability, satisfaction and safety of a new anaesthetic technique combining loco-regional to local anaesthesia Vs a usual technique of local anaesthesia alone [4-11].

Materials and Methods

The study was carried out in 30 surgical patients (satisfying inclusion criteria) divided in two different groups: the first one (Group 1) included patients affected by unilateral diseases of the lid who underwent new anaesthetic method or local anaesthesia alone; the second one (Group 2) included patients affected by bilateral eyelid disease who were treated with the two different anaesthesia techniques.

This clinical study was approved by local committee.

The inclusion criteria were the following four: 1) diseases of lid region needing surgery presumably lasting 30-60 minutes; 2) personality score ranging from 1 to 3 (score 4 was considered as factor of exclusion of the study); 3) age superior to 18 years; 4) informed consent obtained.

Injection solutions were prepared by an assistant immediately before surgery from stock solutions maintained at room temperature.

The needles were used considering that they should preferably not enter the deeper tissues, as this increases the risk of haemorrhage, but undergo to the orbicular muscle, where the sensory and motor nerves run.

Composition of the groups

In the first group (Group 1) 20 consecutive patients affected by unilateral eyelid disease were divided at random in two subgroups: subgroup 1A including 10 patients treated with the new anaesthesia technique, subgroup 1B including 10 patients treated with the usual anaesthesia technique.

Subgroup 1A (study group): 10 pts, both sexes, undergoing anaesthesia by means of the new technique. Corneal topical administration of Novesina (oxybuprocaine chloride 4 mg/ml) drops was followed by neural block of supra-orbital nerve (for the superior lid) and/or infra-orbital nerve (for the inferior lid) with 0.4 - 0.6 ml 0.5% plain Bupivacaine, and (3 minutes later) by infiltration of lid region tissues with a mixture containing 6 ml anaesthetic solution (3 ml 0.5% plain Bupivacaine + 3 ml 1% Mepivacaine with 5 mcg/ml epinephrine). The anaesthetic blocks of supra-orbital and/or infra-orbital nerve were performed by using a 1 ml syringe with a short 25G needle. The infiltration of the lid region with anaesthetic mixture included, if necessary, even the periostium. The initial total volume of the anaesthetic mixture used for infiltration ranged from 4 to 5 ml. When necessary, further 1 - 2 ml was locally injected.

Neural blocks were performed before local anaesthesia to reduce the discomfort during successive tissue infiltration and to improve postoperative pain control.

Subgroup 1B (control group): 10 pts, both sexes, undergoing anaesthesia by means of the usual method. Corneal topical administration of Novesina drops was followed by infiltration of tissues with a mixture containing, in a total volume of 10 ml, 1 ml Sodium Bicarbon-

ate, 1 ml Jaluronidase, 4 ml 0.5% Bupivacaine containing Epinephrine (5 mcg/ml), and finally 4 ml 3% Mepivacaine. The infiltration of the lid region with anaesthetic mixture included, if necessary, even the periosteum. The initial total volume of the anaesthetic mixture used ranged from 6 to 8 ml. If necessary, further 1 - 2 ml was locally injected.

Group 2 included 10 consecutive patients who were submitted to both anaesthetic techniques, i.e. the eye treated with the usual technique was considered as internal control of the other one submitted to the new technique. The order of technique application was randomly assigned.

Data recorded

Before surgery, all patients were told that they would receive different anaesthetic solutions on each side and were instructed on the use of the 3-point of pain (1-2-3) during intra-operative pain and post-operative time.

Patients were asked to rate the pain felt during the operation on each side by using a 3-point pain scale (as shown in appendix) the day after.

In the same time, surgeon gave his judgment concerning the surgical performance under the conditions offered by the anaesthetic technique applied.

All clinical data were recorded in an opposite sheet and specific scores concerning satisfaction of both patient and surgeon were applied. A special score, rating patient personality, was also used (see appendix).

Statistic analysis

The variables among different categories regarding satisfaction scores were described using absolute frequency. Using Pearson Chi-square test or Fischer exact test was verified statistical association among different groups. Standard deviation and mean value of continuous variables were obtained. Differences among mean values were evaluated by means of Student-t test or Wilcoxon rank-sum test, the p-value 0.05 being statistically significant.

Results and Discussion

The results of composition of patients treated are shown in table 1.

	Group 1			**Group 2**
	Subgroup 1A	**Subgroup 1B**	***p* value**	
	(study)	**(control)**		
Number of cases	10	10		10
Sex (m,f; n. of cases)	5 m, 5 f	5 m, 5 f	ns	2 m, 8 f
Age (years; mean ± sd)	59.1 ± 16.7	65.5 ± 16.6	ns	53.1 ± 14.9
Weight (Kg; mean ± sd)	70.5 ± 16.5	76.2 ± 8.9	ns	75.9 ± 10.7
Height (cm; mean ± sd)	166.7 ± 8.1	170.4 ± 8,8	ns	164.5 ± 10.2
Personality score (n. of cases)				
Type 1	9	8	ns	6
Type 2	1	2		3
Type 3	0	0		1
Type 4	0	0		0
Surgical time (min; mean ± sd)	35.0 ± 16.3	24.0 ± 9.4	ns	64.0 ± 6.6

Table 1: *Patients general data.*
No significant difference (age, weight, height and surgical time) in Group 1 (subgroup A Vs subgroup B) and in Group 2 (bilateral surgery).

In Table I the Group 1- subgroup A (group of study, i.e. group submitted to the use of the new anaesthesia technique) -subgroup B (control's group, i.e. group using the old technique) and the Group 2 (i.e. patients submitted to bilateral surgery) were comparable about age, sex, weight, height, personality, and surgical time, since no significant difference was observed.

Results of intra-operative patient satisfaction, postoperative patient satisfaction and judgement of surgeon, regarding the subgroups A and B of Group 1, appear in table 2. No significant difference between the two subgroups was observed.

	Group 1		
	Subgroup A (study)	**Subgroup B (control)**	***p value***
Number of cases	10	10	
Intra operative patient satisfaction (n. of cases)			0,714
score 4 (high satisfaction)	6	4	
score 3 (good satisfaction)	3	4	
score 2 (sufficient satisfaction; better treatment in future)	1	2	
score 1 (no satisfaction)	0	0	
Post operative patient satisfaction (n. of cases)			0,211
score 3 (high satisfaction, no analgesics)	10	7	
score 2 (good satisfaction, need analgesics)	0	2	
score 1 (no satisfaction)	0	1	
Surgical judgment (n. of cases)			
score 3 (very good operability, no complications)	7	7	1,000
score 2 (appropriate operability, rare complications)	2	2	
score 1 (not sufficient, need additional anaesthesia)	1	1	

Table 2: *Group 1 results: score evaluation of intra and post operative patient satisfaction and general surgeon's opinion.*

No significant difference between subgroup A and subgroup B.

Table 3 shows the results into Group 2 regarding satisfaction of patients in the intra and postoperative period, and judgement of surgeon: the two different techniques of anaesthesia have compared each other.

	Group 2		
	New technique (study	**Usual technique (control)**	***p value***
Eyes number	10	10	
Patient intra operative satisfaction (n. of cases)			0,031
Score 4 (high grade satisfaction)	7	2	
Score 3 (normal grade satisfaction)	3	4	
Score 2 (sufficient satisfaction; better treatment in future)	0	4	
Score 1 (no satisfaction)	0	0	
Patient post operative satisfaction (n. of cases)			0,350
Score 3 (high grade satisfaction, no analgesics)	8	5	
Score 2 (normal grade satisfaction, need of analgesics)	2	5	
Score 1 (no satisfaction)	0	0	
Surgical judgment (n. of cases)			0,033
Score 3 (very good operability, no complaints)	10	5	
Score 2 (sufficient operability, some complaints)	0	2	
Score 1 (not sufficient, need additional anaesthesia)	0	3	

Table 3: *Group 2 results (bilateral surgery in 10 patients): patient satisfaction during intra and post operative period and surgeon judgment regarding two different anaesthetic techniques.*

New Vs Usual technique: Intra-operative: P value = 0

Post-operative: P value = ns

Surgeon judgment: P value = 0.033

More patients (7/10 Vs 2/10) were completely satisfied during surgery receiving the new technique of anaesthesia in comparison with the old one. Four patients rated as sufficient the quality (score 2) of the old anaesthesia during intra-operative period, but none

expressed the same low score versus the new anaesthesia technique. Intra-operative superiority of the new technique is confirmed by statistical analysis ($P < 0.05$).

In the same fashion, high grade of post-operative satisfaction (score 3) was more frequently seen (8/10 Vs 5/10) following application of the new technique of anaesthesia; on the contrary, normal grade of satisfaction (score 2), which included need of analgesics, occurred more frequently by using the old technique (5/10 Vs 2/10). However, these results are not corroborated by the statistical evaluation (P = n.s.).

As far as the judgement of surgeon is concerned, very good operability without complaints (score 3) occurred in all cases when the new anaesthesia technique was applied. On the contrary, the old technique was scored as 2 or 1 in a half of patients. Of course, the difference between the two technique was statistically significant ($P < 0.05$).

The current anaesthetic technique (named "the old technique") used in our Ophthalmic Department of Ophthalmic Plastic surgery was based on a mixture of 0,5% Bupivacaine with 5 mcg/ml Epinephrine, Jaluronidase and Natrium Bicarbonate, as illustrated in the Materials ad Methods. Such a mixture appeared always appropriate for local anaesthesia, both for efficacy and duration of action. However, some side effects might occur due to an excessive volume of the anaesthetic mixture and for the formulation of a poorly soluble solution, directly responsible sometimes for needle's obstruction. Pain during injection of local anaesthetic is often the patients only complain about the surgery. This may be related to several factors including pH, lipid solubility, osmolality, temperature of the solution, and rapidity of the injection.

An effective anaesthesia associated to an unchanged surgical field is mandatory to obtain the best conditions of work in such a very fine surgery. Moreover, the best postoperative pain control is today one the most important goal in outpatient's care.

On the contrary, the old technique of local anaesthesia sometimes needed some analgesic medication at home. To meet patient satisfaction and surgeon need, we propose our new technique of anaesthesia which offer some advantages over the classical technique, based only on the tissues infiltration. As a matter of fact, we have reduced the volume of anaesthetic mixture and increased the comfort of patients by using painless peripheral nerve blocks before the local anaesthesia.

Intra-operative satisfaction of patients was better when the new anaesthesia technique was used, as observed almost when the two different techniques were applied in the same patient for bilateral surgery. In this case, no patient said to want a better treatment in the future following peripheral blocks, while in 4 cases local anaesthesia was judged as something to ameliorate.

Postoperative satisfaction scores were higher following use of the new technique, and no case of partial satisfaction (respectively scores 2 and 1) was recorded when peripheral blocks anticipated local anaesthesia in Subgroup A. In the same fashion, postoperative satisfaction of patients of Group 2, receiving both anaesthesia techniques, showed better results following the new anaesthesia. In addition, the peripheral blocks assured a long lasting and high quality postoperative pain relief. Thus, present study has completely demonstrated the good postoperative satisfaction of the patients treated with blocks in comparison with patients treated with the old anaesthesia technique. In the present study, a satisfactory personality score was required as necessary in inclusion criteria to exclude no-collaborative and/or too anxious patients. Also, no sedation was used because of possible interference on the global judgement of patients about the anaesthesia technique employed. Of course, we believe that the grade of satisfaction of patients, as scores in the study, was due to their free opinion.

Judgement of surgeon appeared very interesting. When surgeon treated patients in Group 1 separately in the Subgroups A and B, operability seeded similar with the two different techniques of anaesthesia. However, when the two different techniques were applied for bilateral surgery in the same patient, surgeon assigned always the highest scores about operability in the presence of the new technique.

Conclusion

When ophthalmic plastic surgery needs to be performed the association between neural block of supra-orbital on/or infra orbital nerve and direct infiltration of tissues with a local anaesthetic mixture *ad hoc* may offer the best results regarding intra-operative comfort and postoperative pain control of patients. Also, the surgeon may find better work conditions managing the soft and fine tissues surgically without excessive iatrogenic edema.

Appendix

Score of patient intra-operative satisfaction

SCORE 4 = high grade satisfaction
SCORE 3 = normal grade satisfaction
SCORE 2 = sufficient satisfaction, better treatment in future
SCORE 1 = no satisfaction

Score of patient post-operative satisfaction

SCORE 3 = high grade satisfaction; no analgesic medication
SCORE 2 = normal grade satisfaction; need of analgesics
SCORE 1 = no satisfaction

Score of judgment of surgeon

SCORE 3 = very good operability; no complaints
SCORE 2 = sufficient operability; some complaints
SCORE 1 = insufficient; need of further anaesthesia

Personality Score

SCORE 1= a quiet patient, unthawing with words or visible behaviour an anxiety state.
SCORE 2= a lightly worried patients, getting out doubts and perplexities, but not excessively upset.
SCORE 3= a very worried patients, showing an anxious state, but in witch is prevalent the reason to surgery.
SCORE 4= a psychotic patients refusing local or loco-regional anaesthesia (exclusion criteria).

Bibliography

1. Biswas S., *et al*. "Low-dose midazolam infusion for oculoplastic surgery under local anesthesia". *Eye* 13.4 (1999): 537-540.

2. Gotsis SS., *et al*. "Percutaneous anaesthesia with a lignocaine-prilocaine cream (Emla) for eyelid skin surgery". *British Journal of Ophthalmology* 78.3 (1994): 209-210.

3. Haberer JP., *et al*. Anesthesie en ophthalmologie. Encycl Med Chir, Elsevier, Paris, Anesthèsie-Rèanimation (1999): 1-20.

4. Meyer Bartamian M. "Site of service, anesthesia, and postoperative practice patterns for oculoplastic and orbital surgeries". *Ophthalmology* 103.10 (1996): 1628-1633.

5. Huang CH., *et al*. "Repairing Facial Soft Tissue Defects by Swelling Anesthesia after Tumor Resection with Narrow Pedicle Flaps". *Asian Pacific Journal of Cancer Prevention* 16.15 (2015): 6761-6763.

6. Goldberg RA., *et al*. "Orbital Tumors Excision without Bony Marginotomy under Local and General Anesthesia". *Journal of Ophthalmology* (2014): 424852.

7. Bidros RS., *et al*. "Subcutaneous temporal browlift under local anesthesia: a useful technique for periorbital rejuvenation". *Aesthetic Surgery Journal* 30.6 (2010): 783-788.

8. Deleuze A., *et al*. "Regional anaesthesia for head and neck surgery". *Annales Françaises d'Anesthésie et de Réanimation* 28.9 (2009): 818-823.

9. Maheshwari R. "Single-prick infiltration anesthesia for external dacryocystorhinostomy". *Orbit* 27.2 (2008):79-82.

10. Skibell BC., *et al*. "Periocular anesthesia in aesthetic surgery". *Seminars in Plastic Surgery* 21.1 (2007): 37-40.

11. Bhananker SM. "Injury and liability associated with monitored anesthesia care: a closed claims analysis". *Anesthesiology* 104.2 (2006): 228-234.

Volume 5 Issue 6 March 2017