

Use of local and local-regional anaesthesia plus sedation during aesthetic plastic surgery procedures in ambulatory and day surgery

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Abstract

In the field of aesthetic plastic surgery the use of local anaesthesia and sedation is continuously increasing due to patient demand and due to its safety. It is also more comfortable for the surgeon to have a cooperative patient. The costs are reduced and the surgery appears to be less traumatic. The local anaesthesia and sedation are to be balanced based on the type of surgery and on the patient's characteristics. A total of 120 patients received intravenous sedation of midazolam and ketamine immediately prior to local anaesthetic injection and successively every 20/30 min intraoperatively. Different mixtures of local anaesthetic at volumes 'believed' beyond limits have been used without any trouble at all. There were no perioperative or postoperative complications. Patients and surgeon related a high degree of satisfaction with this approach. © 1997 Elsevier Science Ireland Ltd.

Keywords: Anaesthesia; Sedation; Surgery

1. Introduction

The use of local anaesthesia and sedation is increasingly growing in aesthetic plastic surgery. Patients and their relatives, who are worried about possible complications and side effects connected to general anaesthesia, are requesting local anaesthesia. It also makes it possible carry out the majority of interventions in day hospital with consequent minor surgical trauma and minor costs.

When the local anaesthesia and sedation are well dosed and therefore well combined, it is possible to submit the patient to a long lasting operation where numerous areas are involved.

Between 1994 and 1995, 120 patients 19–55 years old, mostly females, underwent surgical intervention using local anaesthesia and sedation. Fifteen percent of these were combined surgeries (Table 1). Postoperative recovery time was between 1 and 6 h. Only 5% of the patients asked to spend the night in the hospital.

There are two important aspects to consider when using this methodology:

(A) The type of local anaesthetic to be used, its mixture (Table 2), its appropriate local concentration and the maximum volume that can be administered to the patient without the risk of overdose toxicity.

(B) The use of drugs which administered intravenously, lead quickly to sedation, analgesia and amnesia and which can, at the same time, be eliminated shortly or which if necessary, can be easily opposed by antagonists at the end of surgery.

Finally, in the immediate postoperative phase, the choice of an efficacious analgesic is very important as it must reduce pain to the minimum while allowing the patient to return home.

2. Materials and methods

The choice of the anaesthetic to be used depends upon the type of intervention [1,2]. In the case of lipoaspiration we use lidocaine which, for its features, better meets the needs of this procedure. It has in fact

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a faster action compared to other local anaesthetics, a higher diffusion capacity and a higher plasma level, potentially dangerous, compared to other local anaesthetics (from 3–7 $\mu\text{g/ml}$) [3]. During this type of surgery, when more than one area is to be treated (prevision of aspirated fat over 2.0 ml) (Fig. 1), we can use up to 90 ml of lidocaine at 2% in a percentage generally between 0.1 and 0.2% with adrenaline 1:500 000 injecting and aspirating first on one side, then the other. With this system, even if using a high volume of drug, the anaesthetic eventually absorbed is very diluted, maintaining a low plasma level of lidocaine.

As it has been widely clinically proven by many authors [4–7] during lipoaspiration the plasma level of anaesthetic remains low, due to the limited vascularization of the adipose tissue. This is even more reduced by the addition of adrenaline and by the lipoaspiration itself which eliminates part of the injected mixture. In five patients we measured the lidocaine level 1 h from the beginning of the surgery and 1 h after it and we ascertained that the level was always under the potentially dangerous limit.

In fact, the use of adrenaline permits a lower absorption of the anaesthetic resulting in the reduction of plasma level, reduced emetic loss and a longer lasting effect of the anaesthesia. Furthermore by mixing the anaesthetic with Ringer lactate and sodium bicarbonate we obtained an increase in pH, raising the quantity of non-ionized anaesthetic and thus also its tissue diffusion, concentration in nerve fibres and, consequently, the onset of the block, preventing the full perception of the stimulation of the pain [8,9].

In the case of breast reduction we also use bupivacaine 0.1% being a more powerful and longer lasting anaesthetic. We usually employ more than one mixture of anaesthetic with different concentrations.

Concentrations used were higher for the areas to be incised (lidocaine 0.5%) and for the areas close to nerve endings (bupivacaine 0.1% + lidocaine 0.5%) and were at a lower concentration (lidocaine 0.1–0.2%) for the areas of undermining which have less algogenous receptors [10,11].

In five patients submitted to breast reduction we have recorded the lidocaine serum level that appeared to remain under the dangerous limit. Also, with combined surgery, we use different anaesthetic mixtures in order to exploit their single features.

Table 1
Combined procedures performed: 15% of patients

Cosmetic breast + liposuction	8
Cosmetic face + liposuction	3
Rhinoplasty + liposuction	3
Cosmetic breast + rhinoplasty	2
Miniabdominoplasty + liposuction	2

Table 2
Volume of local anaesthetics abtually used

Liposuction	(prevision of aspirated fat over 2.0 liter) up to 90 ml of lidocaine 2% adrenaline 1–500.000
Breast reduction or abdomen	50 ml lidocaine 2%, 10 ml bupivacaine 0.1%, mepivacaine 2%, adrenaline 1–250.000
Breast implant	50 ml lidocaine 2%, adrenaline 1–200.000
Cosmetic face	50 ml lidocaine 2%, 10 ml mepivacaine 2%, adrenaline 1–250.000

The area to be operated first is injected with lidocaine while the second area to be treated is injected with mepivacaine as it is slower at onset but has a longer lasting action. Then we start surgery on the first area.

This technique is appropriate when the predicted duration of the first operation is less than 30/40 min. Furthermore we suggest that, when possible, the patient spreads a thick layer of anaesthetic cream (EMLA) (Astra-Simes SpA, Milano) on the involved areas at least 1 h prior to surgery in order to reduce the pain when the anaesthetic is injected [12].

To obtain amnesia, sedation, reduce anxiety and decrease the incidence of possible convulsions caused by local anaesthetics, we use a mixture of midazolam and chloridrated ketamine [13–19].

Patients receive intravenous premedication with atropine 0.5 mg and fentanil 0.05–0.1 mg, 15 min before surgery. Just prior to local anaesthetic injection, in order to reduce or even eliminate its painful stimulus, patients receive a quick intravenous dose of midazolam 0.3–0.5 mg/kg and, ketamine 0.4–0.5 mg/kg depending on their age, weight and the surgery they will undergo. Successively, every 20–30 min the patients receive, an additional intravenous infusion which is 1/4 of the initial solution to maintain adequate analgesia and sedation. In some cases to improve the analgesic effect, there is an additional use of fentanil between 0.05 and 0.1 mg.

All surgery was performed with patients monitored throughout the procedure with automated blood pressure, continuous ECG, and pulse oximetry. An antibiotic prophylaxis is always given for 24–48 h. Also 20 mg of nefopam are generally injected during the immediate postoperative phase as analgesic. It is used because it operates well on the pain without interfering with coagulation and has limited side effects.

3. Results

There were no perioperative or postoperative complications, no nausea or vomiting and no incidence of nightmares. On the other hand patients frequently reported a pleasant illusion of bright colours. One patient reported the illusion of playing a video-game. A very

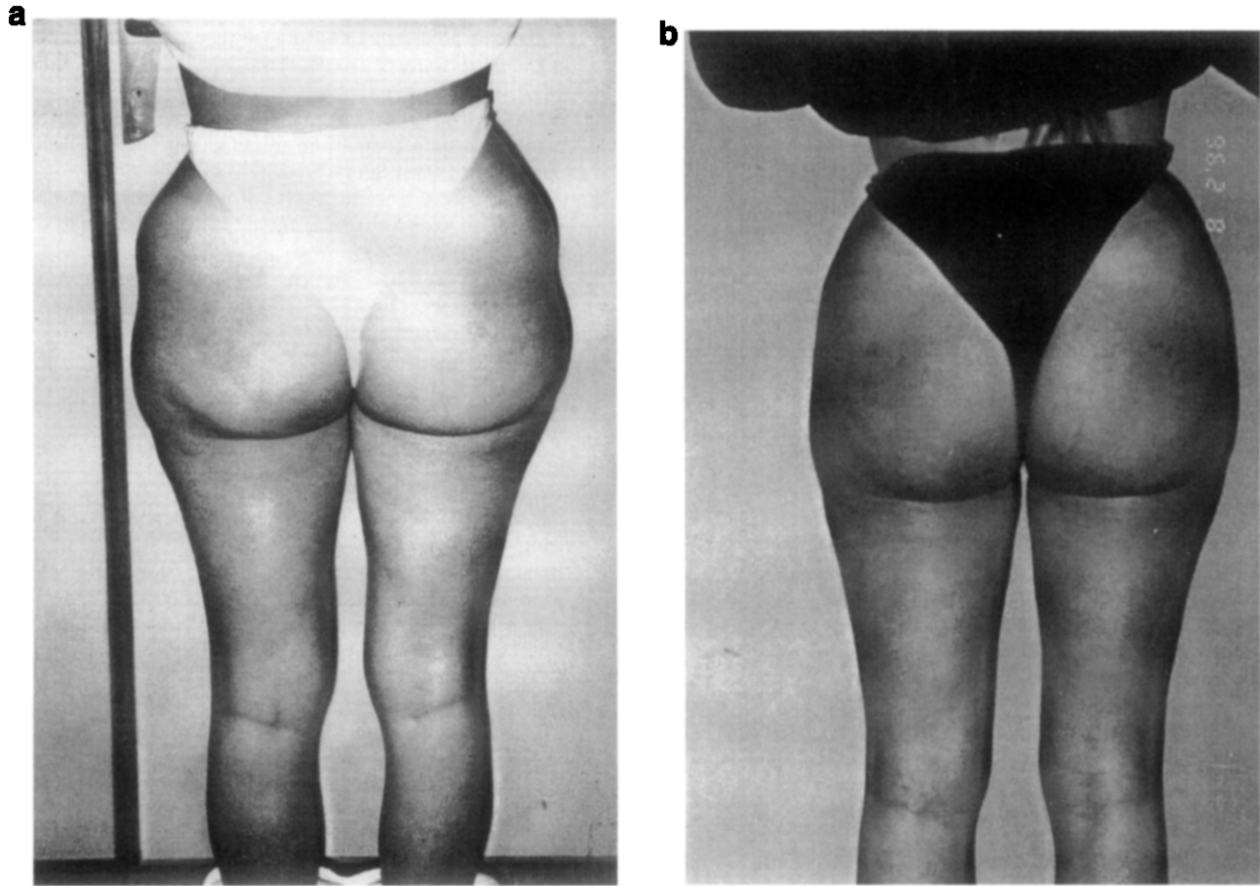


Fig. 1. (a) Preoperative and (b) postoperative views. Liposuction of flanks, trochanteric, knees and inner thigh areas (2.2 ml of fat aspirated).

low percentage of patients, generally the more anxious, reported a moderate recall of pain perception during anaesthetic injection and sometimes during surgery.

All patients said they were satisfied with this technique.

4. Conclusion

Midazolam is an effective anxiolytic, sedative and amnesic agent which acts rapidly, with a fast metabolic clearance. Ketamine is an efficacious analgesic, even at low doses, which produces deep analgesia of short length without causing respiratory depression or loss of protective pharyngeal and laryngeal reflexes. It has a

Table 3
Mixtures of local anesthetic

Lidocaine	0.1–0.5%
Mepivacaine	0.1–0.5%
Bupivacaine	0.1%
Adrenaline	1–100.000/1–500.000
Lactated ringer	Sodium bicarbonate

Percentages of local anaesthetics generally used. The higher percentages are used for the areas to be incised and/or close to nerve endings.

fast onset and offset action. Furthermore ketamine with midazolam produces a more effective sedation. The use of fentanyl as analgesic during premedication enhances the effect of ketamine and maintains a prolonged state of analgesia.

The opportunity of safely using different local anaesthetics at variable dosages (Table 2) and percentages (Table 3), as necessary, together with an efficacious sedation allows the surgeon to attempt a wider range of interventions. Furthermore, we believe that it is time to begin to re-evaluate the volume of local anaesthetic that it is possible to use safely during surgical interventions.

The advantages are many: the opportunity for ambulatory and day hospital surgery with reduced costs; less worries and anxiety for patients; more cooperation with the surgeon during surgery and last but not least the absence of the possible problems connected to general anaesthesia.

Acknowledgements

We wish to thank Isabella Minasi for her valuable help in translation.

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