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TO THE ISSUE OF CHOOSING THE METHOD OF ANESTHESIA AND ANALGESIA DURING RECONSTRUCTIVE PLASTIC SURGERY OF THE LOWER LIMB

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✓ ***Resume***

On the basis of carried out comparative analysis the author considers that lidocaine spinal anesthesia in combination with hydrochloride morphine in the dose of 0,07-0,08 mg proved to be the method of choice of anesthesiology preparation in traumatic and orthopedic operations; it provides good analgesia and hemodynamic stability in adequate independent breathing of patient during the operation for the account of subarachnoid component as well as smooth early postoperative period with adequate analgesic component for the account of local anesthetic in combination with narcotic analgesics.

Key words: the choice of the method of anesthesia and analgesia in reconstructive plastic surgery of the lower limb.

К ВОПРОСУ ВЫБОРА МЕТОДА АНЕСТЕЗИИ И АНАЛЬГЕЗИИ ПРИ РЕКОНСТРУКТИВНО-ПЛАСТИЧЕСКИХ ОПЕРАЦИЯХ НИЖНЕЙ КОНЕЧНОСТИ

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✓ ***Резюме***

На основании проведенного сравнительного анализа автор полагает, что методом выбора анестезиологического пособия при реконструктивно пластических операциях является спинальная анестезия лидокаином в сочетании с гидрохлоридом морфина в дозе 0,07-0,08 мг, которая обеспечивает хорошую анальгезию и стабильность гемодинамики при адекватном самостоятельном дыхании больного во время операции за счет субарахноидального компонента, а также стабильное течение раннего послеоперационного периода с адекватным анальгетическим компонентом за счет местного анестетика в комбинации с наркотическим анальгетиком.

Ключевые слова: выбора метода анестезии и анальгезии при реконструктивно-пластических операциях нижней конечности.

REKONSTRUKTIV-PLASTIK JARROHLIK OPERATSIYADA ANESTEZIYA VA ANALGEZIYA USULINI TANLASH

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✓ ***Rezyume***

Qiyosiy tahlilga asoslanib, muallif rekonstruktiv plastik jarrohlik uchun anestetik yordamni tanlash usuli - bu lidokain bilan morfin gidroxloridi bilan birgalikda 0,07-0,08 mg dozada o'murtqa behushlik qilish, bu esa yaxshi analjeziya va gemodinamik barqarorlikni ta'minlab, bemorning etarli darajada o'z-o'zidan nafas olishi bilan ta'minlaydi. subaraknoid tarkibiy qism tufayli operatsiya vaqti, shuningdek operatsiyadan keyingi dastlabki davrning barqaror analjezik komponenti bilan mahalliy og'riqsizlantiruvchi vosita bilan birgalikda og'riq qoldiruvchi og'riq qoldiruvchi vositasi tufayli.

Kalit so'zlar: oyoqning rekonstruktiv plastik jarrohligida anesteziya va og'riqsizlantirish usulini tanlash.

Relevance

Modern reconstructive plastic surgery (RPH) makes increasingly high demands on anesthetic management aimed at improving traditional methods of anesthesia [2, 14, 16]. The choice of rational methods of anesthesia in each specific case with RP is a certain difficulty, since it is necessary to take into account the severity and prevalence of the main process, the presence or absence of disorders of the functions of vital organs, the nature and scope of the operation itself [4, 12, 17]. Patients with this pathology very often, already in the initial state, need to carry out a number of measures to prepare for the intervention, aimed at ensuring good healing and a successful outcome of the operation. All these activities continue in the postoperative period as well [7, 13, 15]. Indeed, on how comfortable the patient is, it will depend on whether he will or will not follow all the necessary recommendations after the operation.

Until now, there are no clear recommendations on how to effectively ensure the safety of the increasingly complex reconstructive plastic surgery. There is also no specific method for postoperative analgesia in these patients [4]. In view of the above, the development of a scientific and practical substantiation of methods of general anesthesia in reconstructive plastic surgery seems to be very relevant.

Purpose: comparative assessment of the methods of anesthesia and postoperative analgesia in reconstructive plastic surgery on the lower extremities.

Material and methods

Studies in 106 patients aged 16-55 years (35 men and 46 women) with reconstructive plastic surgery on the lower extremities for the consequences of burns and injuries of the 1st-2nd degree (ASA I-II class). 73.8% of patients were young (up to 30 years old) age without concomitant pathology. Combined plasty (42 patients), plasty with a displaced flap (24), cross plasty (22), and expander implantation (18 patients) were performed. Duration of operations is from 0.5 to 2.5 hours.

All patients received intramuscular atropine, antihistamines and tranquilizers in the usual doses 20 minutes before the operation.

Perioperative infusion-transfusion therapy was carried out taking into account the initial water-electrolyte balance, the nature of the reconstructive intervention, the operation time, the effectiveness of the neuro-autonomic blockade, the hemoglobin and hematocrit parameters, and urine output. The amount of intraoperative blood loss in all types of surgical interventions was minimal and did not exceed 50-100 ml. The infusion volume averaged 350 ± 70.0 ml / hour and was qualitatively determined by the following composition: sodium chlorine 0.9%, 5% glucose, rheopolyglucin, saline solutions.

The state of the systemic circulation during the operation was assessed by the dynamics of the mean blood pressure, changes in the heart rate using a pulse oximeter (SPO2).

All patients after the operation were admitted to the postoperative intensive care unit and were under dynamic monitoring. The patient's condition and the quality of postoperative pain relief were assessed using a set of clinical criteria and monitoring the level of consciousness. The level of sedation was assessed using the Ramsay sedation scale: I level - the patient is agitated, impatient; Level II - the patient is awake, calm, focused, cooperates with the doctor; Level III - the patient is conscious, but reacts only to commands; IV level - the patient is asleep, but reacts to touch or loud sound; V level - the patient is asleep, responds slowly and sluggishly to tactile stimuli or a loud sound; Level VI - sleeps and does not respond to stimuli. The intensity of postoperative pain in dynamics was judged by the scale of verbal assessments (VER): 0 - no pain; 1 - mild pain when moving, absent at rest; 2 points - moderate pain during movement, weak at rest; 3 points - severe pain during movement, moderate at rest; 4 points - unbearable pain [6].

All of the above indicators were recorded on the eve of the operation (stage I), in the surgical stage of anesthesia (stage II), during the main stage of the operation (stage III), at the end of the operation (stage IV).

In group 1 (27 patients), multicomponent endotracheal anesthesia was used: induction of fentanyl, barbiturates in generally accepted calculated doses. Maintenance of anesthesia: seduxen - 0.3-0.6 mg / kg (10-20 mg), fentanyl - 4-6 μg / kg (0.005% from 10 to 16 ml), droperidol (0.25% from 6 to 13 ml), ketamine 1-3 mg / kg (100-150 mg). Myoplegia was performed with arduane 0.06-0.1 mg / kg (from 6 to 10 mg). Ventilation was carried out with a mixture of O_2: N_2O = 1: 2. At the end of the surgery, ventilation was performed until the restoration of independent adequate breathing and awakening. For the purpose of postoperative pain relief, 2% promedol - 20 mg, ketonal - 30 mg, 1% diphenhydramine - 10 mg, seduxen - 10 mg were parenterally administered.

Patients of the 2nd group (21 patients) were operated on under conditions of epidural anesthesia (puncture of the epidural space at the LII-LIII, LIV-LV levels, disposable sets "Portex" G18, followed by catheterization of the epidural space in the cranial direction by 4 cm). Test dose - 2% lidocaine - 5 ml (100 mg). Amide anesthetics were used as the main anesthetic: bupivacaine 0.5% solution at a dose of 100 mg. In the early postoperative period, anesthesia was achieved by epidural administration of 5 ml (25 mg) of 0.5% bupivacaine solution through a catheter.

Patients of the 3rd group (36 patients) underwent surgery under conditions of subarachnoid anesthesia. Lumbar puncture was performed at level LIII - LIV with a Portex G-25 needle. Intrathecal used 0.5% spinal bupivacaine - 3-4 ml (15-20 mg). Adequate spinal block developed in 5-8 minutes. For the purpose of pain relief in the postoperative period, the methods of parenteral administration of narcotic analgesics were used in combination with NSAIDs, antihistamines, sedatives (2% promedol - 1 ml (20 mg), ketorol - 30 mg, 1% diphenhydramine - 1 ml (10 mg), seduxen - 10 mg).

Group 4 (22 patients) included patients operated on under spinal anesthesia - lidocaine in combination with morphine hydrochloride at a dose of 0.07-0.08 mg (narcotic analgesic with the aim of potentiating the analgesic effect of local anesthetic).

All of the above indicators were recorded on the eve of the operation (stage I), during anesthesia (stage II), at the beginning of the operation (stage III), during the main stage of the operation (stage IV), at the end of the operation (stage V).

Result and discussion

The method of general anesthesia as an anesthetic aid to patients of the 1st group was used in cases when conduction methods were contraindicated and the patient refused.

Table 1 shows the hemodynamic parameters at the stages of surgery in patients of the 1st group. The patients had relatively stable hemodynamics before the main stage of the operation. However, in the main stage of the operation, there was a statistically significant decrease in blood pressure (compared with the initial state) from 84.5 ± 2.6 to 82.5 ± 2.5 mm Hg. Art. and a decrease in heart rate from 78.9 ± 1.8 to 72.3 ± 3.7 per minute until the end of the operation. Changes in the direction of improving oxygen saturation were not reliable. The main disadvantages of general anesthesia in patients of this category are: significant inhibition of hemodynamics and severe pain syndrome against the background of post-anesthetic sedation in the early postoperative period. The relief of severe pain syndrome was carried out by the introduction of narcotic analgesics and drugs of other groups, which required mandatory monitoring of respiration and hemodynamics.

Patients of group 2, operated on under epidural blockade, developed general anxiety and agitation in 5-7 minutes. In this regard, it became necessary to add intravenous ketamine, fentanyl, dormicum. Against the background of additional administration of drugs for anesthesia, statistically significant changes in hemodynamics were observed with a tendency to relative hypotension at all stages of the operation.

As a result of administration of centrally acting drugs and deepening of anesthesia, 2 patients of the older age

Table 1

Hemodynamic parameters at the stages of endotracheal anesthesia in patients of the 1st group (M ± m).

Indicator	Stage I	Stage II	Stage III	Stage IV
HELL cf. Mm Hg	84,5 ± 2,6	87,6 ± 2,3	82,5 ± 2,5	83,3 ± 2,2
Heart rate beats / min	78,9 ± 1,8	80,7 ± 2,9*	72,3 ± 3,7 **	84,0 ± 3,5 *** ***
S_pO_2	96,9 ± 0,3	98,2 ± 0,2 *	98,0 ± 0,3 *	96,9 ± 0,4 *** ***
Intravenous infusion volume, ml				3,150±311
blood loss				155±4,12
Diuresis, ml / h				42±4,12

Note. - * p <0.05 compared with baseline values.

group developed respiratory disorders, which required tracheal intubation and mechanical ventilation. By the end of the intraoperative period, hypotension became pronounced (Table 2).

Table 2

Hemodynamic parameters at the stages of epidural anesthesia in group 2 patients (M ± m).

Indicator	Stage I	Stage II	Stage III	Stage IV
HELL cf. Mm Hg	89,1 ± 2,4	84,7 ± 1,3	85,5 ± 3,1	86,1 ± 4,5
Heart rate beats / min	71,7 ± 2,8	68,8 ± 2,1	73,5 ± 3,9	87,3 ± 2,9 * ** *** 0
S_pO_2	97,9 ± 0,3	97,6 ± 0,1	97,7±0,3 **	96,3 ± 0,1* ** 0
Intravenous infusion volume, ml				3,900±194
blood loss				112±4,12
Diuresis, ml / h				46±4,23

Note. - * p <0.05 compared with baseline values.

Hemodynamic changes were controlled by increasing the rate of infusion therapy and the introduction of vasoconstrictors.

Increasing hypotension after 6-8 hours of the use of sedatives and analgesics also required an increase in the volume of infusion-transfusion therapy. In some patients, symptoms of discomfort and dyspepsia were observed.

All patients of the 3rd group at all stages of the operation retained an adequate sensory-motor block, which did not require additional administration of analgesics. Hemodynamic parameters were quite stable, no respiratory disturbances were observed. In order to ensure comfort, sedation was performed with dormicum, the total consumption of which did not exceed 5 mg per operation. The intraoperative period proceeded with relatively stable hemodynamic parameters, but, as in other groups, there was a significant decrease in blood pressure and a decrease in heart rate and bradycardia (Table 3).

Table 3

Hemodynamic parameters at the stages of spinal anesthesia in group 3 patients (M ± m).

Indicator	I	II	II	IV
HELL cf. Mm Hg				87,0 ± 3,5
Heart rate beats / min	78±3,44	71±3,34	68±3,24*	84,3 ± 4,6 *** ***
SpO2	97,9 ± 0,3	97,4 ± 0,1	96,6 ± 0,3 **	97,5 ± 0,1 ***
Intravenous infusion volume, ml				3,600±240
blood loss				116±11
Diuresis, ml / h				43±3,66

Note. - * p <0.05 compared with baseline values.

Analgesia with the use of subarachnoid anesthesia at all stages of the operation was sufficient, but after the operation the pain syndrome in patients of this group was pronounced. The treatment was carried out in exactly the same way as in the 1st group - narcotic and non-narcotic analgesics in conventional doses. Providing adequate postoperative analgesia has been challenging.

Patients of the 4th group underwent spinal anesthesia with lidocaine in combination with morphine hydrochloride at a dose of 0.07-0.08 mg (narcotic analgesic in order to potentiate the analgesic effect of local anesthetic). In this case, the spinal component was intended for the intraoperative period, and the narcotic analgesic was intended for postoperative analgesia. In this group, there were no technical difficulties in carrying out the method. The spinal block developed and proceeded similarly to that in the patients of the 3rd group; potentiation was not required; in order to create comfort for the patients at the intraoperative stage, only superficial intravenous sedation with dormicum was performed, the consumption of which did not exceed 5 mg. Hemodynamic parameters were also characterized by a decrease in blood pressure and heart rate, remaining stable throughout the operation (Table 4).

Table 4

Hemodynamic parameters at the stages of spinal anesthesia with morphine in group 4 patients (M ± m).

Indicator	I	II	II	IV
HELL cf. Mm Hg	88,3 ± 2,8	79,8 ± 3,5 *	80,6 ± 2,2 *	81,4 ± 3,4
Heart rate beats / min	78±3,22	73±3,61*	71±3,42*	72±2,56*
SpO2	94±1,52	96±0,87	97±0,63*	97±0,63*
KSR: pH			7,39	7,42
pCO_2			38	37
pO_2			82	84
Intravenous infusion volume, ml				1,820±117
blood loss				111±12
Diuresis, ml / h				44±2,97

Note. - * p <0.05 compared with baseline values.

The stability of hemodynamic parameters made it possible to reduce the volume of intraoperative infusion therapy, to exclude colloids from its composition. The most adequate method of postoperative anesthesia proved to be the method used in patients of the 4th group (Table 5).

Table 5

Hemodynamic parameters in the early postoperative period (M ± m)

Indicator	Stage I	Stage II	Stage III	Stage IV
HELL cf. Mm Hg		70±3,25	71±3,05	95±3,83* **
Heart rate beats / min	82±2,5	78±3,94	90±4,82*	64±3,62* **
SpO2	94±1,6	94±1,32	92±1,81	94±1,61
Sedation degree	IV	II	IV	II
Multiplicity of introduction analgesic	2-3 times intravenously	1-2-fold anesthetic through an epidural catheter	2-3 times intramuscularly	once
ShBO, scores	2-3	1-2	2-3	0-1

Note: * p <0.05 compared with group 2, ** p <0.05 compared with group 3

A single administration of lidocaine (2 mg / kg) in combination with morphine (0.07-0.08 mg) provided rapidly developing, adequate, prolonged 24-72 hours analgesia without hemodynamic suppression. Breathing and SpO2 were adequate, patients were in superficial sedation (level II), in a state of emotional peace and comfort. Studies have shown that combined general anesthesia does not provide hemodynamic stability during the operation, especially at the time of the main stage of the operation. General anesthesia has such disadvantages in the early postoperative period as post-anesthetic depression and severe pain syndrome. Many authors speak of a clear advantage of regional anesthesia in operations on the lower extremities [1, 9, 11].

Epidural anesthesia has an insufficient analgesic intraoperative effect due to the peculiarities of the innervation of the knee joint and the unequal effect of local anesthetic on various types of sensitive fibers (A, B and C) of large nerves Lv-SI and SII [3, 8].

In general, this type of anesthesia is quite effective, but requires the addition of sedatives. Subarachnoid (spinal) anesthesia provides adequate analgesia during the operation, but not in the immediate postoperative period. To relieve postoperative pain requires the use of analgesics (narcotics and NSAIDs), which can cause respiratory and hemodynamic disturbances in elderly patients. A single administration of lidocaine (2 mg / kg) in combination with morphine (0.08-0.1 mg / kg) with spinal anesthesia in most cases met all the requirements for adequate analgesia in the intra- and postoperative period, was not accompanied by significant hemodynamic disorders, pain the syndrome in the postoperative period was either absent or insignificant. Prolonged analgesia is an effective method for relieving acute pain after surgery with a low risk of side effects and high quality of pain relief [1, 5].

In order to improve the quality of postoperative pain relief without increasing the frequency of side effects, the addition of opioid analgesics to local anesthetics is justified. Table 5 presents a comparative assessment of hemodynamic parameters in patients of the examined groups in the early postoperative period, from which it can be seen that patients after spinal anesthesia have statistically significantly more pronounced hypotension and a decrease in Sp02, compared with epidural and spinal - lidocaine in combination with morphine hydrochloride - anesthesia.

In patients after epidural anesthesia, marked sedation (level IV) is noted, associated with the prolonged effect of the drugs administered for intraoperative potentiation. The most favorable indicators of hemodynamics were observed in patients of the 4th group against the background of level II sedation.

Conclusion

Based on the comparative analysis, we believe that the method of choice of anesthetic aid for reconstructive plastic surgery is spinal anesthesia with lidocaine in combination with morphine hydrochloride at a dose of 0.07-0.08 mg, which provides good analgesia and hemodynamic stability with adequate spontaneous breathing of the patient during operation time due to the subarachnoid component, as well as a stable course of the early postoperative period with an adequate analgesic component due to a local anesthetic in combination with a narcotic analgesic.

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