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Opioid free anesthesia in bariatric surgery: a case report.

MEHDI Youssef[1,6], AZIZI Khadija[1,6], SQUALLI Majda[1,6], CHIADMI Sofia[6], N'MILI Youssef[1,6],ALARIS EL YDRISSI Ihab, KETTANI Ali[1,4,6], BELKHADIR HOUSSAIN Zakaria[1,5,6], ARJI Moha[3,6,] ABABOU Adil[1,6], CHAJAI Younes[2,6]

[1] *Department of Intensive Care and anesthesiology, Cheikh Zaid Hospital, Rabat, Morocco*
[2] *Department of Pediatric and neonatal Intensive care, Abulcasis University, Cheikh Zaid Hospital, Rabat, Morocco*
[3] *Department of cardiovascular Intensive Care and anesthesiology, Cheikh Zaid Hospital, Rabat, Morocco*
[4] *Department of Intensive Care and Anesthesiology, Trauma Unit, Ibn Sina Hospital, Mohamed V University, Rabat, Morocco*
[5] *Department of Intensive Care, National Institute of Oncology, University Mohammed V, Rabat Morocco*
[6] *Abulcasis International University of Health Sciences – UIASS*
[7] *Faculty of medicine and pharmacy of Rabat, Morocco*

Abstract:
Opioid Free Anesthesia is an attractive technique of anesthesia whose purpose is the non-use of opioids whether in systemic, neuraxial or intra-cavitary.
Opioids are known for there side effects especially in pathological ground like obesity, respiratory diseases, sleep apnea and others.
after consultation with my head doctor, we decided during the anesthesia consultation to perform this anesthesia technique for a sleeve gastric intervention by laparoscopy in a patient with a history of obstructive sleep apnea and obesity.
we tried a multimodal protocol combining different drugs that interfere with the physiology of pain and its perception, as well as a loco-regional analgesia technique.
I will try to describe the anesthetic technique that we used in this patient, the drugs, the monitoring, the chronology, and whether or not we needed to introduce an opioid to ensure the analgesic side in the perioperative

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I. Introduction

Opioids have been used for decades to treat pain and they had improved the quality for life of many patients with various type of pain, acute, chronic, or carcinologic pain and also in the peri operative period.

this increased use of opioids has left anesthesia facing an opioid crisis [1,2], especially in patients treated for chronic pain or in patients who may develop a chronic pain in the postoperative [1], a study of a repeated postoperative morphine in rats has favorized the persistence of postsurgical pain [3]. above all, we do not know the limit doses to prescribe which vary according to several factors such as the type of surgery, the surgical approach, the psycho-affective level and the conception of the pain as well as others. [1]

II. Case Report

A 42-year-old male patient, seen in the pre-anesthetic consultation for a gastric sleeve.

The patient had a history of hypertension treated by a calcium channel blocker; obstructive sleep apnea syndrome fitted with a CPAP therapy and occasional drinking, a casual gastric reflux, no history of surgery, thromboembolic disease, smoking or allergy.

His body weight was 145 Kg, height 175 cm and BMI 47, blood pressure was 130/74 mmHg, heart rate 84 bpm, spO2 98% at the ambient air, the cardiorespiratory auscultation was correct, his lee score was 1 and MET > 4.

His mallampati was 2, correct mouth opening and cervical mobility with a short neck considered as difficult intubation with the necessity of the difficult intubation trolley in the operating room.

We also ranked the patient as full stomach with necessitates of rapid sequence induction and a premedication with Cimetidine 300mg (Tagamet ®) 2 hours before admission in the operatory bloc.
There was no expected difficulty for venous access and a biological examination was prescribed for hemostasis, blood grouping, irregular agglutinin testing, complete blood count, renal function and serum electrolytes.
We also asked the patient to bring his CPAP and the respect of pre-operative fasting.

on the day of the operation, we welcomed the patient to the operating room, did the pre-operative checklist, reviewed the results of the blood tests requested and get sure he got his Cimetidine.
We took a 18G green peripheral venous line and infuse 150 µg of clonidine (Catapressan®, 1µg/kg) and Magnesium 3g (40mg/kg) over 20 minutes and antibioprophylaxis Cefazoline® 4g.
We took the patient to the operating room, he was installed in the 20° Trendelenburg position with the start of 5 cmH_2O PEP preoxygenation.
for monitoring, we chose standard monitoring with non-invasive pressure, pulse oximeter, heart rate with temperature, neuromuscular monitoring, bispectral index BIS and get sure the difficult intubation trolley is in the room.
When the expired oxygen fraction was 90%, we started the induction with 1.5mg/kg of lidocaine 2%, nearly 200mg (10ml), a crush induction with 40mg of Propofol followed by 0.25mg/kg of Ketamine (nearly 35mg), then 2mg/kg of Propofol and 100mg of Succinylcholine.
We waited for the end of fasciculations (1 minute nearly) intubate the patient and protect the airways, we started a protective ventilation, maintenance of anesthesia with Sevoflurane® for a MAC of 1% adapting it with the bispectral index for a goal of 40-50% and Cisatracurium (Nimbex®).

We took a second 18G green peripheral venous line and began a continuous infusion of Lidocaine 2% (2mg/kg/h) and Ketamine 0.2% at 0.2mg/kg/h with the flow of 0.1x weight and also gave the antiemetic prophylaxis with ondansetron and dexamethasone (0.1mg/kg) as an antiemetic and an analgesic adjuvant.

There was no hemodynamic incident in the preoperatory and the surgery took 3 hours, the patient got warmed with a forced air patient warming and IV fluid warmer and the dose of Sevoflurane was monitored by the bispectral index.
30 minutes before the end of surgery, we began a multimodal analgesia with Paracetamol 1g, Ketoprofen 100mg and Nefopam40mg, we stopped the continuous infusion of Ketamine and Lidocaine and waited for the end to do a bilateral transversus abdominis plane block.
The emergence was set in the post-operative care room, patient extubated and put on CPAP with no pain and he wasn't asking for adding another analgesic drug.
The patient was able to take back liquids 2 hours after extubating and solids the next day.
A multimodal analgesia was prescribed with Paracetamol, Ketoprofen, Nefopam and if needed Morphine, a thrombophylaxis with low heparin molecular weight Enoxaparin (Lovenox®) 50mg double dose a day.

III. Discussion

After the wide use of opioids in anesthesia, these drugs provide a very interesting analgesic effect with hemodynamic stability by suppressing the sympathetic nervous system and his reaction to the surgical injury maintaining blood pressure and heart rate [4,5], which is very useful for fragile patients such as coronary and brain injured. But their side effects have been multiple and are well known like the activation of pronociceptive processes 'opioids induced hyperalgesia' making opioids ineffective [6,7] motivating the use of other families of analgesics and anesthesia adjuvants like magnesium, ketamine, lidocaine, clonidine, dexamethasone showing a beneficial analgesic and antihyperalgesic properties [8].

But, how can we monitor a safe OFA? first we have to use the term of 'nociception' instead of pain in patients under anesthesia which is the neural process of encoding and processing noxious [5,9]and have to know that those nociceptive inputs to the central nervous system can promote central sensitization who can also be the cause of persistent postoperative pain [10,11].

So, for our patient we used the bispectral index BIS and the cardiovascular stability and variability, the first one derived from the electroencephalogram who is the reflect of cortical activity and not the rest like sub-cortical [12], it can interfere with drugs like Ketamine [13] who increases it value and other drugs that can act in different sites like clonidine and dexmedetomidine [14].The second one is the cardiovascular stability and variability, in literature, it's the marker of autonomic nervous system. We have the heart rate variability obtained from ECG signal and the analgesia nociception index, but the problem with it is that is the marker of cardiovascular status and acute stress [15].

Other options are available to monitor the OFA like the Pulse Plethysmography with the surgical pleth index SPI [16] studying the finger microcirculation and its variations reflecting the intraoperative analgesic

changes but its downside is that it can give an idea on the post operatory pain and also the fact that the microcirculation interfere with many situations as bleeding, reperfusion syndrome… [17]

Also, another option is the variation of pupil diameter with the pupillometry but it s not continuous and interfere with deep anesthesia [18].

The OFA keep the choice to give opioids for the postoperative if the multimodal analgesia can't provide it [19]. It can prevent patients from the side effects of opioids like nausea, vomiting, pruritus, constipation, urinary retention, sedation, respiratory depression and postoperative delirium [6].

Their intraoperative administration induces postoperative acute tolerance and a phenomenon called opioid induced hyperalgesia which worsens pain and increases postoperative opioids analgesics consumption [20]. In the other hand, other technics of analgesia like ketamine, locoregional anesthesia and clonidine are associated with improved postoperative analgesia [21].

The opioids also can increase the area of secondary hyperalgesia surrounding the surgical wound [22], the prevalence of development of chronic pain and increases hyperalgesia in the parts of the body that have not been operated [20], so the OFA deserves big attention and have to be considered in many indications.

But, the problem is that we don t know how we conduct the best OFA and the best utilization of the different drugs of analgesia and adjuvants, also if there is difference of drug using according to the type of surgery or type of patients [23,24].

The other problem is that we don't know the patients who will benefit the best of this technique, but what's sure is that is efficient and improve the outcome of patients with obstructive sleep apnea syndrome, chronic pain, chronic treated with opioid and the bariatric surgery [25].

IV. Conclusion

The OFA is a seductive technique that all anesthesiologists have to keep in their heads, its use is very large but we don't have international protocols.

The subtility of the non-use of opioids and its sparing can help to prevent many side effects of this drugs and help to avoid the opioid induced hyperalgesia, the transition to chronicity of the pain and the extension of it.

The practitioner has to be able to handle the analgesic adjuvant, the analgesia drugs and the locoregional analgesia to offer patients welfare and better outcome without forgetting the possibility of using opioids for several pain.

In last, we have to make difference between pain and nociception and there is no specific monitoring able to tell us the real status of nociception.

V. Declarations

5.1. Acknowledgements

None.

5.2. Authors contribution

All authors passed the criteria for authorship contribution based on recommendations of the International Committee of Medical Journal Editors.

5.3. Ethical consideration

The authors adhered to confidentiality of patients' profiles and ethical recommendations regarding research in biomedical field.

5.4. Conflict of interest

The authors declare that there is no conflict of interest regarding
this study.

5.5. Source of financial support

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