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Anesthesia for Laparoscopy in A Hospital of Sub-Saharan Africa

Sambou P[1]*, Kane MM[1], Ntab SO[2] and Barboza D[1]

[1]*Anesthesia and resuscitation Department, Peace Hospital, Training & Research Unit -Health Sciences, Assane Seck University, Ziguinchor, Senegal*

[2]*Gynecology and Obstetrics Department, Peace Hospital, Ziguinchor, Senegal*

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***Corresponding author:** Sambou P, Anesthesia and resuscitation Department, Peace Hospital, Training & Research Unit -Health Sciences, Assane Seck University, Ziguinchor, Senegal

Summary

Introduction: Laparoscopy is classically recognized as allowing improved rehabilitation after surgery. The pneumoperitoneum and the patient positions required for laparoscopy induce pathophysiological changes that complicate the conduct of anesthesia and are at the origin of specific anesthetic and surgical constraints.

Objective: To evaluate the anesthetic practice of laparoscopy in the operating room of the Ziguinchor Peace Hospital Center.

Methodology: This is a retrospective and descriptive study over the period from June 1st, 2021 to June 30th, 2023. Were included all patients admitted to the operating room of the Ziguinchor Peace Hospital for laparoscopy.

Results: During the study period, the frequency of Celio surgery was 5.23%. The average age was 44.5 years and a sex ratio of 1.3. The indications were digestive in 67.1%. The surgery was elective in 92%. A medical history was found in 20.4%. Patients were classified as ASA 1 in 86.3% while an APFEL score of 1 was found in 55.2%. General anesthesia with curarisation was done in all patients without monitoring of the curarisation. Anesthetic induction was classic in 88.2%. In 98.1%, the patients were awakened at the operating table and 6.8% were transferred to intensive care after surgery. Epidural analgesia was performed in 3.72%. Rach morphine was performed in 2.48%. Intravenous analgesia was performed with 100% paracetamol, Tramadol 99.3% and NSAIDs 45.5%. The infiltration of the trocar orifices at the end of the intervention was carried out in 100%. The post-operative pain scores were satisfactory. Post-operative complications were 1.2% with a lethality of 0.6%.

Conclusion: The progressive development of laparoscopy in our context implies a rehabilitation of the anesthetist, particularly in monitoring curarization and loco-regional anesthesia techniques in order to improve post-operative rehabilitation.

Keywords: Anesthesia; Celio Surgery; Hospital of Peace; Ziguinchor

Introduction

At present, a very large number of surgical acts of digestive, gynecological and urological surgery are carried out by this approach. Many arguments in the literature attest to the advantages of laparoscopic surgery compared to laparotomy surgery. In addition to a lesser abdominal trauma and a better aesthetic result, most of the work finds a decrease in postoperative pain and complications, fewer postoperative adhesions, a reduction in intraoperative bleeding and finally a reduction in the duration and costs of hospitalization. Laparoscopic surgery is classically recognized as allowing improved rehabilitation after surgery [1]. The pneumoperitoneum and the patient's positions required for laparoscopy induce pathophysiological changes that complicate the conduct of general anesthesia and are at the origin of specific anesthetic and surgical constraints. Laparoscopic surgery has for some years concerned increasingly older patients often with polypathologies providing the conduct of general anesthesia, which is often more complex due to the risk of respiratory and cardiovascular complications. From a respiratory perspective, the pneumoperitoneum is responsible for its own pathophysiological changes: reduced lung compliance, increased airway pressures, increased PaCO2 and specific complications such as the risk of pneumothorax, of pneumomediastina and gas embolism. The hemodynamic changes observed during pneumoperitoneum associate a decrease in cardiac output and an increase in systemic and pulmonary vascular resistance. The incidence of complications associated with laparoscopic surgery varies greatly depending on the type of surgical procedure and the experience of the surgeon.

Fortunately rare, these complications require careful monitoring, especially during insufflation and exsufflation of the pneumoperitoneum as well as energetic management by the

anesthetic team. Laparoscopy exposes in particular to the risk of extraperitonal insufflation but also intravascular or subcutaneous. In order to prevent and limit the incidence of postoperative nausea and vomiting, often associated with laparoscopic surgery, many studies argue for the systematic use of anti-emetic drugs, particularly in patients at risk. As part of a multimodal management of postoperative analgesia, the infiltration of trocar incisions at the beginning of the intervention has demonstrated its interest. In order to limit the incidence of postoperative scapular pain, it is important to insist on the need for a limitation of intra-abdominal pressure to 12 mmHg and careful exsufflation of the pneumoperitoneum which must be systematic at the end of the intervention [2]. The studies on anesthetic management of patients operated under laparoscopy are disparate and few, particularly in Senegal and more specifically in Ziguinchor. Since its advent in Senegal in 1995, laparoscopy was mainly practiced only in the region of Dakar [3]. At the Peace Hospital in Ziguinchor, laparoscopy procedures started in June 2021. The objective of our work was to evaluate the anesthetic management of laparoscopy in the operating room in Ziguinchor.

Patients and Methodology

This is a retrospective and descriptive study whose recruitment was carried out over the period from June 1, 2021 to June 30, 2023. Were included all patients admitted to the operating room of the Ziguinchor Peace Hospital for laparoscopic surgery. The parameters analyzed from the anesthesia sheets were: age, sex, diagnosis, indication, context (emergency or settled), APFEL score, medical history, ASA score, anesthetic technique, type of induction, monitoring, incidents, analgesia, pain scores (Simple Numerical Scale) and the operating sequences. The word processing was carried out with Microsoft WORD software and the data analysis, diagrams and tables with Microsoft Office EXCEL software.

Results

During the study period, 161 interventions were performed under laparoscopy. The frequency of laparoscopy was 5.23%. The average age was 44.5 years with extremes of 9 and 84 years and a sex ratio of 1.3. The most represented age group was between 20 and 40 years old in 47.2%. The surgical indications were digestive in 67.1%, gynecological in 17.4% and urological in 15.5%. The surgery was elective in 92% of cases. A medical history was found in 20% of cases. The medical history found were: hypertension in 13.1%, type 2 diabetes in 3.1%, smoking in 1.8%, asthma and sickle cell disease in 1.2% each. Patients were classified as ASA 1 in 86.3%, ASA 2 in 9.93%, ASA 3 in 3.1% and ASA 4 in 0.62%. In 55.2% the APFEL score was 1 and in 42.8% the APFEL score was 2. General anesthesia with curarization was done in all patients without any premedication. Anesthetic induction was classical in 88.2% and fast-sequential in 11.8%. The intraoperative monitoring was carried out on all our patients. These were airway pressure monitoring, capnography, cardioscopy, non-invasive blood pressure, pulse oximeter, diuresis and insufflation pressure. The monitoring of curarisation has not been carried out as well as that of decurarisation. An operative incident was found in 0.6% of cases involving a type of hemorrhagic shock requiring conversion to laparotomy. The conversion rate was 3.1%.

Indications of conversion other than hemorrhagic shock were technical issues in 2.5%. Waking up on the operating table was done in 98.1% of the patients. Admission to post-operative intensive care was necessary in 6.8% of patients. The reasons for admission found were epidural analgesia and delay in waking up in 27.3% each, post-operative monitoring on fragile grounds in 36.4% and long-term surgery in 9%. The average length of stay was 1.3 days with extremes of 1 and 3 days. The post-operative complications were delirium tremens and withdrawal syndrome in 0.6%, a septic shock in 0.6% also. The mortality during our study period was 0.6% and was secondary to a post-operative septic shock with multi-organ dysfunction syndrome. Thoracic epidural analgesia was performed in 3.72%. Spinal analgesia with morphine at a dose of 200 mcg was performed in 2.48%. Intravenous analgesia was performed with paracetamol in 100% of cases, tramadol in 99.3% and NSAIDs in 45.5%. The infiltration of the trocar orifices was carried out after the removal of the trocars in all our patients. The post-operative pain scores were satisfactory with simple numerical scales less than 3 in all our patients.

Discussion

In our study, the frequency of procedures under laparoscopy was 5.23%. This result is explained by the acquisition of a laparoscopy column and the renewed interest of surgical and anesthetic teams for this new approach. The frequency of laparoscopy is generally low in Africa despite the efforts made. Indeed, in Saint Louis, NDONG had recovered a frequency of 1.11% from 2018 to 2021 [3]. Conversely, higher frequencies were found in Mali between 11.3% and 19%. These frequencies were recorded over longer periods. The average age of our patients was 44.5 years and the most represented age group was 20 to 40 years old. This could be explained on the one hand by the youth of the African population and on the other hand by the fact that in our current context, laparoscopy is more aimed at young patients classified as ASA 1 [3-5]. Our results are similar to those found in Benin and Chad with respectively 41 and 40.7 years [4,5]. Slightly similar results were found by NDONG in Senegal and FOTSO in Mali with 31.2 years and 34.1 years, respectively [3,6]. BERTHE in Mali has regained a predominance of this same age group [7]. In our series, the sex ratio was 1.3. This male predominance would be linked to one of our selection criteria which consists in taking into account any patient operated by laparoscopy as much in visceral surgery as in urology or gynecology.

LAWANI had regained female predominance with a sex ratio of 0.4 in visceral surgery [4]. Similar results were found by

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NDONG, FOTSO and BERTHE [3-7]. This divergence is explained by a selection bias. There was a predominance of gynecological indications in their studies. In our study, digestive indications were predominant in 67.1%. This is explained by the fact that in Senegal, this pathway has been initiated in digestive surgery [8]. The indications for laparoscopy have expanded as shown by the studies of FOTSO and BERTHE in Mali [6,7]. The majority of interventions in our study were performed in settled mode in 92% of cases. The initiation of this approach and the poorly trained teams explain this predominance of the elective mode in order to avoid incidents and complications. NDONG had regained a patient predominance on the urgent mode. This last study had found higher rates of incidents and complications [3]. The pathophysiological effects observed during pneumoperitoneum will condition the preoperative evaluation and contraindications of patients. In each patient, the intraoperative risk should be discussed in relation to the expected postoperative benefit [1]. In 20%, land was found at the preoperative evaluation. An adapted anesthetic protocol allowed these patients to benefit from the postoperative advantages of this surgical technique. FOTSO and BERTHE had recovered respectively 10 and 26.7% [6,7]. The preoperative evaluation had found an APFEL score of 1 in 55.2% and in 42.8% the APFEL score was 2. This would be explained by the male predominance and the low opioid consumption in our series.

In order to prevent and limit the incidence of postoperative nausea and vomiting, often associated with laparoscopic surgery, many studies argue for the systematic use of antiemetics, particularly in patients at risk (APFEL > 2 score) [1]. General anesthesia with curarisation is necessary in order to have a good muscle relaxation and reduce surgical complications. In 17.7%, it was a full stomach involving rapid sequence induction. The induction drugs were mainly propofol, fentanyl and atracurium. Berthe had found a predominance of these different drugs in his study. The use of short-acting general anesthetic agents shortens the wake-up period. A more comprehensive monitoring including monitoring of sleep depth, curarization, and temperature would allow better management of the awakening. The BIS would allow monitoring the depth of anesthesia while monitoring curarisation would reduce the risk of a delay in awakening. The absence of these monitoring elements had impacted the rate of admission to intensive care given the lack of a post-intervention surveillance room. This would explain the high rate of admission to post-operative intensive care. The surgical complications were essentially hemodynamic and are at the origin of a conversion to laparotomy. We had found a per-operative incident rate of 0.6% and a conversion rate of 3.1%. Post-operative complications are on the one hand related to the underlying field and on the other hand, they were mechanical and infectious.

The post-operative complication rate was 1.2% in our study. They were linked to the land. It was delirium and withdrawal syndrome. The complications were of infectious origin, notably septic shock. NDONG had found a higher rate in 7.3% of mechanical origin (eventration, iatrogenic digestive breaches) and infectious origin (trocar orifice suppurations, peritonitis). MOUSSA had found a complication rate of 2.3% related to an opening on the trocart orifice. As part of improved rehabilitation after surgery, multimodal analgesia is recommended combining intravenous analgesics, cicatricial infiltration, spinal analgesia and epidural. This improved post-surgery rehabilitation allows for faster mobilization in order to reduce complications and the duration of hospitalization. In our study, all patients benefited from intravenous analgesia and an infiltration of the trocart orifices at the end of the intervention.

Epidural analgesia was performed in 3.72% of patients and spinal analgesia in 2.48%. The post-surgery rehabilitation imposes quality perioperative multidisciplinary care [1]. The infiltration of trocar incisions at the beginning of the intervention demonstrated his interest. The limitation of intra-abdominal pressure to 12 mmHg and careful exsufflation at the end of the intervention reduces postoperative shoulder pain [1]. Locoregional analgesia (LRA) should be preferred from the intraoperative period [1]. Hospitalization durations are generally reduced. We found an average duration of hospitalization of 1 day with extremes of 1 to 3 days. NDONG, LAWANI and FOTSO had respectively found 3 days, 4 days and 2.6 days. This can be explained by the surgical technique and the occurrence or not of post-operative complications. The mortality associated with laparoscopic surgery is known to be low. The mortality in our study was 0.6% related to post-operative infectious complications. Higher rates were identified by NDONG and LAWANI respectively 1.6% and 1.26%.

Conclusion

The progressive development of laparoscopy in our context involves rehabilitation of the anesthetist, particularly in monitoring and locoregional anesthesia techniques, in order to improve post-surgery rehabilitation and reduce complications related to laparoscopy.

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