

Evaluation of the Anesthetic Management of Patients Operated for Maxillofacial Reconstruction Surgery in a Sub-Saharan Country: About Six Observed Cases

BA Elhadji Boubacar^{1*}, Fall Cheikh², Ndiaye Mouhamadou Makhtar¹, Ndiaye Abibou¹, Diop Ulimata², Sène Marie Victoire², Sène Etienne Birane², Diao Elhadji Malick², Boiro Thiéyacine², Bazid Saad², Kane Oumar¹

¹Faculty of Medicine, Cheikh Anta Diop University, Dakar, Senegal

²Anesthesia-Resuscitation Department of the Fann University Hospital, Senegal

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*Corresponding author: BA Elhadji Boubacar

Faculty of Medicine, Cheikh Anta Diop University, Dakar, Senegal

Abstract

Original Research Article

Introduction: The main challenge of general anesthesia in maxillofacial surgery is the maintenance of airway patency in a specialty where the anatomy of the upper airway can be modified. The aim of our work is to evaluate the anesthetic management of patients operated for maxillofacial reconstruction surgery. **Patients and methods:** This is a prospective descriptive observational study of six (06) patients operated for maxillofacial reconstruction surgery as part of a mission with a Western team. For each patient, we collected preoperative, intraoperative and postoperative data. Data analysis and processing were performed with Sphinx Plus software (Version: V5.TuiTe). **Results:** In this report of 06 patients, with a clear female predominance (sex ratio = 0.2) with an average age of 26 years, 66.6% benefited from a mandibulectomy + fibula flap against 33.3% for frontal tumor excision + parietal flap. Preoperatively, no limitation of mouth opening, the Mallampati score was > 2 in 2 patients or (1/3 patients), only one case of anemia at 9.7 g/dl (16.6%) for an average hemoglobin level of 12.4. Intraoperatively, all patients benefited from intravenous induction: rapid sequence in one patient (16.6%), classic sequence in 05 patients (83.3%). The average duration of surgery was 384 min with extremes of 210 min and 615 min. Estimated blood loss was on average 441 ml [50-1000 ml], with a transfusion rate of 50% and a noradrenaline use rate of 16.6% without hemorrhagic shock objectified in our series. Postoperative complications were represented by one or two cases of flap ischemia (33.3%) requiring surgical revision and one case of submaxillary hematoma, i.e. 16.6%. **Conclusion:** Maxillofacial reconstruction surgery is associated with a success rate that can be improved in our regions. And this requires a unwavering commitment to improving the technical platform as well as continuous training of staff.

Keywords: Anesthesia, reconstructive surgery, maxillofacial, Dakar.

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INTRODUCTION

In sub-Saharan Africa, financial constraints represent the fundamental explanatory element for the population's lack of access to health care [1]. Only 5% of patients have access to safe and affordable surgery [2]. Despite a massive demand for head and neck surgery in our region, there are fewer than 20 surgeons in this field for more than a billion people [2].

In Senegal, this surgical specialty is dominated by tumor pathology (52.5%) followed by plastic surgery (23.8%) and traumatology (18.2%) [3].

The main challenge of general anesthesia in maxillofacial surgery is the maintenance of airway patency in a specialty where the anatomy of the upper airway can be modified. In this type of surgery, difficult intubation is a particularly frequent situation [4] and the detection criteria are the same regardless of the surgical specialty [5].

The aim of this work was to review the anesthetic management of patients undergoing maxillofacial reconstruction surgery.

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PATIENTS AND METHODS

This is a prospective descriptive observational study over a period of eight days from March 7 to 15, 2023. It involved 6 patients selected for the maxillofacial reconstruction surgery mission at the CHNU of Fann.

Patients were collected on data collection sheets from the anesthesia sheets and the hospitalization file.

The preoperative evaluation consisted clinically of a physical examination of all devices and the search for criteria of difficult intubation and biologically of a standard assessment with: Blood count and blood count.

All patients selected for the mission were classified ASA 1 (ASA: American Society of Anesthesiologists), without comorbidities, with an oral opening greater than 35 mm.

Intraoperatively, all patients benefited from:

- From standard monitoring: PANI, FC, SpO₂, spirometry, diuresis
- General anesthesia with oral or nasal tracheal intubation
- From antibiotic prophylaxis
- From maintenance of anesthesia with isoflurane, fentanyl boluses and vecuronium boluses.
- From a tracheotomy at the end of the operation then a tracheal extubation on the operating table

Postoperatively, all patients were admitted to intensive care for monitoring for a few hours before transfer to the hospitalization ward.

The following data were collected:

- Preoperatively: age, sex, medical and surgical history, mouth opening, Mallampati class, hemoglobin level, prothrombin time, activated partial thromboplastin time, platelet count, ASA classification,
- Intraoperatively: antibiotic prophylaxis, agents used at induction, maintenance of anesthesia, type of intubation, use of tranexamic acid, type of surgery, duration of surgery, notion or not of intraoperative transfusion, use of noradrenaline, place of postoperative transfer
- Postoperatively: diuresis, drain production, complications and evolution

Data were collected on survey sheets and data processing was done with Sphinx Plus software.

RESULTS

Our work focused on 06 patients with a clear female predominance (sex ratio = 0.2) with an average age of 26 years and extremes of 6 years and 50 years. No

particular defect in this series, and two patients had a history of mandibulectomy.

Of the 6 patients, 66.6% underwent mandibulectomy + fibula flap versus 33.3% for frontal tumor excision + parietal flap.

Preoperatively, we did not note any limitation of mouth opening and the Mallampati score was > 2 in 2 patients (1/3 patients). Concerning biology, only one case of anemia was observed at 9.7 g/dl (16.6%) for an average hemoglobin level of 12.4 g/dl [9.7-14.8 g /dl]. Blood clots were normal in our series with an average prothrombin rate of 86.9% [78-100%], an average platelet count of 300333/mm³ [269000-367000/mm³], and an average activated partial thromboplastin time of 29.3 seconds [23.3-37.10 seconds].

Intraoperatively, all patients received intravenous induction: including a rapid sequence in one patient (16.6%), versus 05 patients (83.3%) for the classic sequence. The induction drugs were distributed as follows: Propofol at 100%, Fentanyl at 100%, and for curares, vecuronium at 83.3% versus 16.6% for suxamethonium. Only one patient (16.6%) was Cormack 3 with difficult nasotracheal intubation. All patients received antibiotic prophylaxis including cefuroxime for the 2 patients (33.3%) operated on for frontal surgery and amoxicillin-clavulanic acid for the 04 patients (66.7%) operated on for mandibular surgery. Two patients (33.3%) received tranexamic acid after anesthetic induction. The mean duration of surgery was 384 min with extremes of 210 min and 615 min. Estimated blood loss was on average 441 ml [50-1000 ml], with a transfusion rate of 50% and a rate of noradrenaline use of 16.6% without hemorrhagic shock objectified in our series. For intraoperative filling, the mean volume of crystalloids was 3500 ml [1000-5500 ml] and that of colloids was 250 ml [0-1000 ml]. At the end of the procedure, all patients underwent a tracheotomy and extubation of the tracheal tube and were then transferred to intensive care for monitoring.

Postoperatively, the mean drain production on the first postoperative day was 139 ml [10-370 ml]. The mean diuresis over the same period was 2500 ml with extremes of 1430 ml and 3350 ml. The mean postoperative hemoglobin and platelet levels were respectively 10.3 g/dl [7.7-12.8 g/dl] and 252600/mm³ [154000-413000/mm³]. No blood clot disorders postoperatively with a mean prothrombin rate of 81.8% [60-95%] and a mean TCK of 28.6 seconds [26.5-32.3 seconds]. Postoperative complications were represented by one or two cases of ischemia then necrosis of the fibula flap (33.3%) requiring surgical revision and one case of submaxillary hematoma, i.e. 16.6%.

DISCUSSION

The aim of this work was to evaluate the anesthetic management of patients operated on for maxillofacial reconstruction surgery.

In our series of 06 patients, the mean age was 26 years with a clear female predominance (sex ratio = 0.2), without medical history, and with an ASA class < 3. Lèye *et al.*, [3] in a larger study, had noted that maxillofacial surgery in our country involved a young population (mean age = 28 years), with a female predominance (sex ratio = 0.77) and often with a good general condition (ASA1 class = 86.1%). This was confirmed by data from the literature: Rasamoelina *et al.*, [6] in Madagascar and by Binam *et al.*, [7] in Cameroon. The preoperative assessment did not reveal any signs of airway obstruction that could indicate a significant reduction in the airway. However, it allowed to find in two patients (33.3%) a Mallampati score > 2. It should be noted that intubation was only difficult in the patient who had a Mallampati score of 4. Lèye *et al.*, [3] had found a frequency of 21% for Mallampati > 2 with a prediction rate of difficult intubation at 29.8%, unlike Rasolonjatovo *et al.*, [8] in Antananarivo who reported a percentage of Mallampati > 2 significantly higher at 54%.

Induction was exclusively intravenous, and rapid sequence for only one patient (patient 1 with Mallampati score of 4). All patients were intubated with simple endotracheal tubes. However, it is important to note that it is preferable to use reinforced or preformed tubes. The former do not bend during head mobilizations and can be fixed in different positions without needing to be cut or folded, while the latter provide better surgical comfort, because the bend at their nasal emergence limits compression of the nasal wing and therefore necrosis with unfortunate aesthetic consequences [9]. The choice of the type of intubation (oral or nasal) is determined by surgical and anatomical imperatives. In our series, nasotracheal intubation represented 66.6% against 33.3% for orotracheal intubation. This was explained by the frequency of endo-oral interventions. The rate of recourse to this intubation technique found in the literature was lower, with 48.7% in the study of Lèye [3] and 44% in that of Rasolonjatovo [8].

Bleeding is the second major concern of the anesthesiologist in maxillofacial surgery. It can exceptionally be life-threatening, whether during maxillary surgery [10] or in the postoperative course [11].

Thus, moderate to significant bleeding (> or = 500 ml) during surgery was observed in 3 patients requiring a transfusion, i.e. a rate of 50%. However, Lèye [3] in his work found much lower figures with an incidence of significant bleeding in 3 patients requiring a blood transfusion, i.e. 1.2%.

Postoperatively, we did not note any heavy bleeding, unlike Lèye [3] who found it in 03 patients, i.e. an incidence of 1.2%. However, one patient presented with a submaxillary hematoma without respiratory repercussions, although it should be noted that maxillofacial surgery is associated with a significant prevalence of laryngeal dyspnea [12]. Furthermore, ischemia and then necrosis of the flap were noted in 02 patients, i.e. 33.3%. This reflects a higher failure rate compared to certain Asian data including those of Soo-Hwan Byun [13] 0% and C. Zhang [14] 2.4%, and expresses the strict necessity of improving our technical platform and our local skills to aim for an even more efficient result. Despite the morbidity linked to this type of surgery with significant postoperative complications, we have not recorded any deaths in our work. This zero mortality observed in our series confirms the data of Lèye *et al.*, [3] on maxillofacial surgery in Senegal.

CONCLUSION

The specific problems of anesthesia in maxillofacial surgery are dominated by the maintenance of airway patency. The failure of reconstruction due to flap necrosis is not negligible, hence the interest in improving the technical platform to allow the promotion of this very useful type of surgery which is still little developed in our regions.

Authors' Contributions: Data collection, proofreading

Conflicts of Interest: None

Strengths: Better knowledge of the anesthetic management of maxillofacial reconstruction surgery.

Weaknesses of the study: Weakness of the workforce

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