Comparative Study between Opioid-Free General Anesthesia by Dexmedetomidine and Opioid-Based General Anesthesia in Rhinoplasty Surgeries.

Thesis

Submitted for Partial Fulfillment of Master Degree in Anesthesiology

By

Mohamed Nagdy Rashad Mostafa
M.B.B.Ch, Faculty of Medicine, Ain Shams University.

Under Supervisionof

Dr. Diaa Abdel Khalek Akl
Assistant Professor of Anesthesia, Intensive care and Pain Management
Faculty of Medicine-Ain Shams University

Dr. Mona Ahmed Abdelmotaleb Ammar
Assistant Professor of Anesthesia, Intensive care and Pain Management
Faculty of Medicine-Ain Shams University

Dr. Wael Sayed Ahmed El-Gharabawy
Lecturer of Anesthesia, Intensive care and Pain Management
Faculty of Medicine-Ain Shams University

Faculty of Medicine
Ain Shams University
2019

بسم الله الرحمن الرحيم

قالوا

سبحانك لا علم لنا
إلا ما علمتنا إنك أنت
العليم الحكيم

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgement

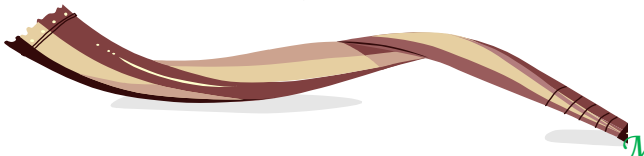
Praise to Allah, the Merciful, the compassion for all gifts, I have been offered one of these gifts is the accomplishment of this work.

Words can never express my thanks to **Dr.Diaa abdelkhalek Akl** *Assistant Professor of Anesthesia, Intensive care and Pain Management Who always gave much of his time, unlimited help, effort and sincere advice for the perfection of the study.*

I am deeply grateful to **Dr.Mona Ahmed Ammar** *Assistant Professor of Anesthesia, Intensive care and Pain Management For her close supervision, effort and sincere advice for the perfection of the study.*

Also, I would like to thank **Dr. Wael Sayed Ahmed El-Gharabawy** *Lecturer of Anesthesia, Intensive care and PainManagement For his assistance, unlimited help, kindness and his appreciation to all what passed during accomplishing this study.*

Finally, I want to thank **my family** *for giving me the continuous motivation to accomplish this work.*



Mohamed Nagdy Rashad

LIST OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ABBREVIATIONS

Abb.		Full Term
BMI	:	Body mass index
BPI	:	Brief Pain Inventory
COX2	:	Cyclooxygenase2
Dex	:	Dexmedetomidine
ERAS	:	Enhanced Recovery after surgery and anesthesia
HR	:	Heart rate
IASP	:	International Association for the Study of Pain
IM	:	Intramuscular
IV	:	Intravenous
LC	:	locus coeruleus
MABP	:	Mean arterial blood pressure
NPRS	:	Numerical Pain Rating Scale
OFA	:	Opioid Free Anesthesia
PaCO2	:	arterial carbon dioxide
PACU	:	post-anesthetic care unit
TIVA	:	Total intra venous anesthesia
VAS	:	Visual Analogue Scale
Vd	:	volume of distribution
VRS	:	Verbal Rating Scale

ABSTRACT

Background: The use of opioid-free analgesic technique have the propensity to decrease and even avoid many of these side effects and lead to early oral intake, early ambulation, earlier hospital discharge, and lesser readmission rates to the hospital in the post-operative period. **Aim of the Work:** to compare the effect of opioid-free using Dexmedetomidine and opioid-based using Fentanyl on hemodynamics (inducing deliberate hypotension and providing a better surgical field exposure), post-operative pain intensity and the incidence of side effects in patients scheduled for rhinoplasty surgeries. **Patients and Methods:** This study included Fifty adult patients undergoing rhinoplasty surgery. Patients were randomly divided into two equal groups. Group D received Dexmedetomidine and Group F received Fentanyl. Patients are ASA physical status I, age group ranged from 18 to 45 years. **Results:** The study revealed a statistically significant decrease mean of group D compared to group F according to intraoperative mean arterial blood pressure. statistically significant decrease mean of group D compared to group F according to intraoperative heart rate (beat/min). **Conclusion:** We found that dexmedetomidine is better than fentanyl for patients who undergo rhinoplasty surgeries to achieve controlled hypotension, decrease dosages of postoperative analgesics, prolong the duration of postoperative analgesia and decrease postoperative nausea and vomiting.

Key words: Opioid-Free General Anesthesia, Dexmedetomidine, Opioid-Based General Anesthesia, Rhinoplasty

INTRODUCTION

Rhinoplasty is still one of the most popular surgical procedures in the world.(***Ishii et al., 2017***).

Opioids are widely used for perioperative analgesia. However, the intra-operative use of large bolus doses or continuous infusions of potent opioids may be associated with post-operative hyperalgesia and increased analgesic consumption.***(Angst and Clark, 2006).***

The use of opioid-free analgesic technique have the propensity to decrease and even avoid many of these side effects and lead to early oral intake, early ambulation, earlier hospital discharge, and lesser readmission rates to the hospital in the post-operative period. ***(Cepedaet al., 2003).***

Dexmedetomidine is a highly selective Alfa-2 adrenoceptor agonist that provides sedation, analgesia, and sympatholysis. Perioperative intra-venous dexmedetomidine administration is associated with a reduction in post-operative pain intensity, analgesic consumption and nausea. ***(Blaudsun et al., 2012).***

Bleeding during operation through the blood rich nasal mucosa obscures surgicalfield visibility and sometimes results in sub-optimal surgical outcome. Application of the controlled hypotension improves operative field visibility and decreases the durationof surgery.***(Tuncel et al., 2013).***

The sympatholytic effect of Dexmedetomidine made it attractive to be used as a hypotensive drug during the surgery. It results in a decrease in heart rate and cardiac output accordingly***.(Ayoglu et al.,2008).***

AIM OF THE WORK

The objective of this study is to compare the effect of opioid-free (using Dexmedetomidine) and opioid-based (using Fentanyl) on hemodynamics, post-operative pain intensity and the incidence of side effects in patients scheduled for Rhinoplasty surgeries.

Review of Literature

Anatomic Considerations in Rhinoplasty

Functional anatomy

The supporting framework of the external nose consists of a bony skeleton from the nasal bones, frontal processes of the maxillae and nasal part of the frontal bone and a cartilaginous framework consisting of septum, upper and lower lateral cartilages and a variable number of minor accessory alar cartilages (Fig. 1) **(Stammberger and Valerie, 2008).**

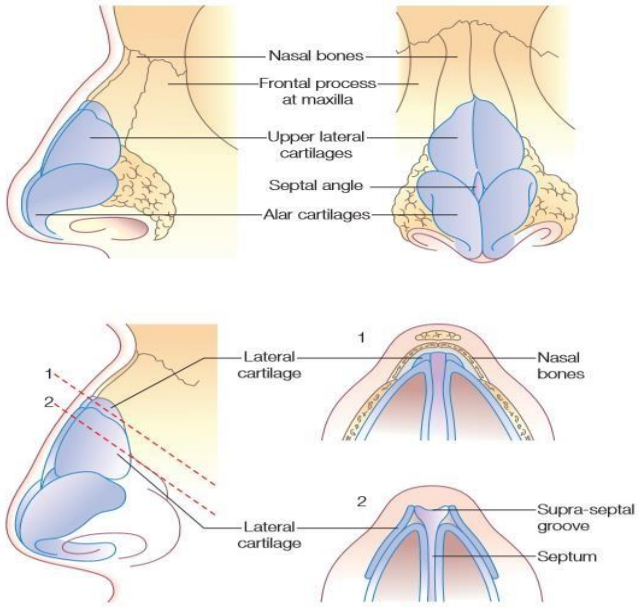


Figure (1): Bony and cartilaginous framework of the nose **(Stammberge and Valerie, 2008).**

Nasal bones:

The nasal bone is wedge-shaped, typically convex and smooth on its outer surface while concave and roughened internally. The nasal bones unite with each other in the midline, with the frontal bone superiorly at the naso-frontal suture and laterally with the frontal process of the maxilla at the nasolacrimal suture. They are supported by the nasal spine of the frontal bone and by the perpendicular plate of the ethmoid. Considerable ethnic and individual variety in the shape and size of the nasal bones exist **(Verlag and lang , 1989).**

Cartilages of the external nose and columella(Fig. 2):

The nasal cartilages are made out of hyaline cartilage. They prevent collapse of the vestibule during inspiration. The upper cartilages are triangular flat expansions lying inferior to the nasal bones and are overlapped by them, by the adjacent frontal processes of the maxillae and by the lower lateral cartilages. The groove between the upper and lower lateral cartilages forms the limen nasi, which is the site of intercartilaginous incisions. The medial aspect of the upper lateral cartilages is continuous with the nasal septal cartilage. The lower lateral or alar cartilages form the lower third of the nose. They are each composed of medial and lateral crus. The medial crura are loosely attached to each other in the midline

and contribute to the columella, anterior to the quadrilateral cartilage. The lower margin of the lateral crus does not follow the margin of the nostril but ascends away from the margin laterally. Between one and four (average 2.3) minor sesamoid cartilages are present between the upper and lower lateral cartilages. The part of the septum running between the tip of the nose and philtrum is called the columella. It bounds the external nares medially and is thicker posteriorly because of the contribution made by the footplate of the medial crura of the lower lateral cartilages ***(Stammberger and Valerie, 2008).***

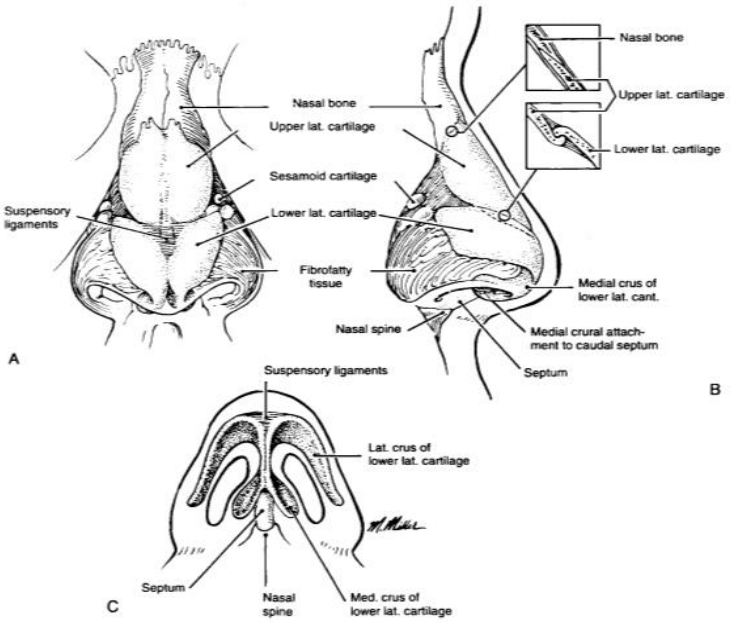


Figure (2): Nasal cartilage anatomy (a) frontal view (b) lateral view (c) basal view **(Ira,2002).**

Nasal cavity:

The nasal cavity extends from the external nares to the choanae, where it becomes continuous with the nasopharynx and is wider posteriorly than anteriorly. Vertically, it extends from the palate to the cribriform plate, being wider at its base than superiorly where it narrows to the olfactory cleft. The nasal cavity is divided into two by the septum. The dimensions and configuration show considerable individual and ethnic variation. Each half has a floor, a roof, a lateral wall and a medial (septal) wall. The floor is concave from side to side, flat and almost horizontal anteroposteriorly. Its anterior three-quarters are composed of the palatine process of the maxilla, its posterior one-quarter by the horizontal process of the palatine bone. The roof is narrow from side to side, except posteriorly, and may be divided into frontonasal, ethmoidal and sphenoidal parts, related to the respective bones. As both the frontonasal and sphenoidal parts of the roof slope downwards, the highest part of the nasal cavity relates to the cribiform plate of the ethmoid which is horizontal. This area is covered by olfactory epithelium which spreads down a little distance onto the upper lateral and medial walls of the nasal cavity. The rest of the nasal cavity (with the exception of the nasal vestibule) is lined by respiratory mucous membrane which is intimately adherent to the underlying periosteum and perichondrium and is