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الطبيب/ رامى محمد نجيب أحمد

بكالوريوس الطب والجراحة العامة جامعة عين شمس

تحت اشراف

الأستاذ الدكتور/ رأفت عبد العظيم حماد

أستاذ التخدير والرعاية المركزة

كلية الطب

جامعة عين شمس

الدكتورة/ نهى محمد قمر الشرنوبى

أستاذ مساعد التخدير والرعاية المركزة

كلية الطب

جامعة عين شمس

الدكتور/ محمد محمد عبد الفتاح

مدرس التخدير والرعاية المركزة

كلية الطب

جامعة عين شمس

كلية الطب

جامعة عين شمس

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Anesthetic Implications for Interventional Cardiological Procedures

Essay

Submitted For Partial Fulfillment of Master Degree in Anesthesia

By

Ramy Mohamed Nageb Ahmed

(M.B.,B.CH.)

Supervised by

Prof. Dr. Raafat Abdel Azim Hammad

Professor of Anesthesiology and Intensive Care Medicine
Faculty of Medicine
Ain Shams University

Dr. Noha Mohamed El Sharnoby

Assistant Professor of Anesthesiology and Intensive Care Medicine
Faculty of Medicine
Ain Shams University

Dr. Mohamed Mohamed Abdel Fattah

Lecturer of Anesthesiology and Intensive Care Medicine
Faculty of Medicine
Ain Shams University

Faculty of Medicine
Ain shams University
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Ramy Mohamed Nagieb


ذلك فضل الله
يؤتيه من يشاء
والله ذو الفضل
العظيمُ
صدق الله العظيم
سورة الجمعه الآية (٤)

List of Contents

List of Abbreviations

AF	Atrial fibrillation
AM	Acute marginal artery
ASA	American Society of Anesthesiologists
ASD	Atrial septal defect
Av node	Atrio ventricular node
BiV	Biventricular
CABG	Coronary arteries bypass grafts
CDAD	Clostridium difficile associated diarrhea
CHD	Congenital heart disease
CHF	Congestive heart failure
COA	Co arctation of aorta
CRT	Cardiac resynchronization therapy
EP	Electro-physiological
GCV	Great cardiac vien
HFJV	High frequency jet ventilation
HR	heart rate
ICE	Intra cardiac echo
ICD	Intra cardiac device
IPPV	Itermitend positive pressure ventilation
LA	Left atrium
LAA	Left atrial appendage
LAD	Left anterior descending artery
LCX	Left circumflex artery
LM	Left main artery
LV	Left Ventricle
MAC	minimal alveolar concentration
MCV	Middle cardiac vien
OM	Obtius marginal artery
PDA	Patent ductus arteriosus
PDa	Posterior descending artery
PFO	Patent foramen ovale
PO	Per oral
PS	Pulmonary stenosis
PVI	Pulmonary vien isolation
PVR	Pulmonary vascular resistance

List of Abbreviations

RCA	Right coronary artery
Rf	Radio frequency
RFA	Radio frequency ablation
RSPV	Right superior pulmonary vien
RV	Right ventricle
RVOT	Right ventricular outflow tract
SA	Sinusoidal artery
SA node	Sinus atrial node
SPAF	Stroke prevention atrial fibrillation
SVR	Systemic vascular resistance
TAVI	Transcatheter aortic valve implantation
TIA	Transient ischemic attack
VSD	Ventricular septal defect
VT	Ventricular tachycardia
WPW	Wolff Parkinson white

List of Tables

List of Figures

List of Figures

Introduction

The demand for anesthetic support for interventional cardiology procedures is increasing as the number and complexity of these procedures rapidly expand. Providing safe anesthesia care to patients undergoing these procedures requires comprehensive preoperative assessment, involvement in the multidisciplinary planning of these cases, and a detailed understanding of the procedures and their potential complications ***(Butera et al., 2010).***

The common interventional procedures are covers closure of intracardiac shunts, closure of patent ductus arteriosus (PDA), left atrial appendage (LAA) occlusion devices, transcatheter valves, and the implantation and removal of pacemaker and rhythm management devices. Electro-physiological (EP) procedures and anesthetic management issues in patients with congenital heart disease (CHD) are reviewed as well as the anesthetic implications of ionizing radiation and practice in a remote location ***(Hayman et al., 2012)***.

Various methods have evolved over the years to handle the specific problems of anesthesia for infants and children undergoing diagnostic heart catheterization. It is generally agreed that some form of general sedation or anesthesia is necessary. Virtually all forms of anesthesia have been used. General anesthesia is recommended by some whereas other forms of sedation are equally popular ***(Drabek and Němec, 2012).***

Rapid progress in interventional cardiology has recently resulted in that the rate of percutaneous coronary intervention overtakes that of coronary artery bypass surgery. Now attention is directed towards the treatment of valvular heart diseases, with exciting developments in balloon and stent technology having the potential to transform the management of many common heart conditions, such as aortic stenosis ***(Coats and Bonhoeffer, 2007)***. Aortic stenosis is the most common form of valvular heart disease in adults, affecting thousands of patients every year and causing significant morbidity and mortality in case of advanced disease. Surgical aortic valve replacement is the treatment of choice for a vast majority of patients. However, in a subset of patients, mainly elderly patients with declining overall health status or severe comorbidities, aortic valve replacement is considered either too high risk or contraindicated ***(Iung et al., 2003)***.

Patients treated in remote locations tended to be older and sicker and more likely in need of emergent care than patients receiving care in operating room settings. Not surprisingly, procedures in remote locations were more likely to involve minimal alveolar concentration (MAC) or no anesthesia than were procedures in operating rooms. The most common remote locations were the cardiology catheterization / electrophysiology suite. The rest of the claims occurred in the emergency room, radiology or lithotripsy suite ***(Metzner, 2010).***

More than half of patients receiving care in remote locations died compared to 29 percent of patients receiving care in operating rooms. In contrast, patients treated in operating rooms were more likely to have temporaty non-disabling injuries than patients treated in remote locations ***(Metzner, 2010).***

Respiratory events were more likely to occur in remote locations than in operating rooms. Inadequate oxygenation/ ventilation was the most common respiratory event. Other types of respiratory events included esophageal intubation, difficult intubation and aspiration of gastric contents ***(Metzner et al., 2009).***

In 30 percent of the remote location, an obsolute or relative overdose of sedative, hypnotic and/ or analgesic durgs led to respiratory depression. Great percent of the patient had no monitoring devices in use during the procedure. Almost all of the cases involving oversedation in remote location resulted in death or severe brain damage ***(Metzner et al., 2009).***

Apnea lasting 20 or more seconds is common in patients receiving MAC sedation. Without the use of capnography or other monitoring equipment, apnea lasting 20 or more seconds is often not detected. According to the ASA stadards for Basic anesthetic monitoring, during MAC the adequacy of ventilation should be determined through continuous

observation of qualitative clinical signs of patient respiration and/or monitoring for the presence of exhaled carbon dioxide.

The patient lies flat and his arms on his head to be away from the imagining field and this carries risk of brachial plexues nerve injury ***(Nordmeyer et al., 2009).***

Aim of the Study

The study aims to present new methods & advances for anesthesia of interventional cardiological procedures instead of open heart surgery.