



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

بسم الله الرحمن الرحيم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم



شبكة المعلومات الجامعية التوثيق الإلكتروني والميكروفيلم



HANAA ALY



شبكة المعلومات الجامعية
التوثيق الإلكتروني والميكروفيلم

جامعة عين شمس

التوثيق الإلكتروني والميكروفيلم

قسم

نقسم بالله العظيم أن المادة التي تم توثيقها وتسجيلها
علي هذه الأقراص المدمجة قد أعدت دون أية تغيرات



يجب أن

تحفظ هذه الأقراص المدمجة بعيدا عن الغبار



HANAA ALY



Ultrasound Guided Pectoral Nerve Block (PEC I) versus Serratus Anterior Plane block (SAPB) for Postoperative Analgesia in Modified Radical Mastectomy

Thesis

*Submitted for Partial Fulfillment
of Master Degree in **Anesthesia***

By

Nada Ezzat Hussein Mohamed

M.B.B.Ch, Faculty of Medicine, Ain Shams University

Under Supervision of

Prof. Dr. Hazem Mohamed Fawzy

*Professor of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine-Ain Shams University*

Prof. Dr. Randa Ali Shoukry

*Professor of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine-Ain Shams University*

Dr. Eman Shawky Abd Elmaksoud

*Lecturer of Anesthesia, Intensive Care Unit and Pain Management
Faculty of Medicine-Ain Shams University*

Faculty of Medicine - Ain Shams University

2021

بِسْمِ اللَّهِ الرَّحْمَنِ الرَّحِيمِ

قالوا

سُبْحَانَكَ لَا عِلْمَ لَنَا
إِلَّا مَا عَلَّمْتَنَا إِنَّكَ أَنْتَ
الْعَلِيمُ الْعَظِيمُ

صدق الله العظيم

سورة البقرة الآية: ٣٢

Acknowledgments

*First and foremost, I feel always indebted to **Allah** the Most Beneficent and Merciful.*

*I wish to express my deepest thanks, gratitude and appreciation to **Prof. Dr. Hazem Mohamed Fawzy**, Professor of Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine-Ain Shams University, for his meticulous supervision, kind guidance, valuable instructions and generous help.*

*Special thanks are due to **Prof. Dr. Randa Ali Shoukry**, Professor of Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine-Ain Shams University, for her sincere efforts and fruitful encouragement.*

*I am deeply thankful to **Dr. Eman Shawky Abd Elmaksoud**, Lecturer of Anesthesia, Intensive Care Unit and Pain Management, Faculty of Medicine-Ain Shams University, for her great help, outstanding support, active participation and guidance.*

I would like to express my hearty thanks to all my family for their support till this work was completed.

Nada Ezzat Hussein Mohamed

List of Contents

Title	Page No.
List of Abbreviations.....	i
List of Tables.....	ii
List of Figures	iii
Introduction	- 1 -
Aim of the Work	4
Review of Literature	
▪ Anatomy of the Thoracic Wall and Breast	5
▪ Pharmacology of Local Anesthetic Drugs	24
▪ Regional Nerve Blocks	35
Patients and Methods.....	45
Results.....	52
Discussion	65
Summary.....	71
Conclusion	74
References	75
Arabic Summary	

List of Abbreviations

Abb.	Full term
<i>AJCC</i>	<i>American Joint Committee on Cancer</i>
<i>HBOC</i>	<i>Hereditary Breast and Ovarian Cancer</i>
<i>HR</i>	<i>Heart rate</i>
<i>MBP</i>	<i>Mean blood pressure</i>
<i>Mcg</i>	<i>Microgram</i>
<i>Mg</i>	<i>Milligram</i>
<i>Mm</i>	<i>Millimeter</i>
<i>NIBP</i>	<i>Noninvasive blood pressure</i>
<i>PACU</i>	<i>Post anesthesia care unit</i>
<i>PEC</i>	<i>Pectoral Nerve Block</i>
<i>RR</i>	<i>Respiratory Rate</i>
<i>SAPB</i>	<i>Serratus Anterior Plane Block</i>
<i>SD</i>	<i>Standard deviation</i>
<i>VAS</i>	<i>Visual analogue scale</i>

List of Tables

Table No.	Title	Page No.
Table (1):	Nerves relevant to pecs block.....	20
Table (2):	Muscles relevant to Pecs	21
Table (3):	Vessels relevant to pecs and serratus plane blocks.....	22
Table (4):	Amides and esters and pKa of each of local anesthetics	24
Table (5):	Maximum doses of local anesthetics in nerve block	24
Table (6):	Intralipid protocol.....	34
Table (7):	Comparison between group I: PEC1 and group II: SAPB according to demographic data.....	52
Table (8):	Comparison between group I: PEC1 and group II: SAPB according to mean arterial blood pressure (mmHg).	55
Table (9):	Comparison between group I: PEC1 and group II: SAPB according to heart rate (beat/min).....	57
Table (10):	Comparison between group I: PEC1 and group II: SAPB according to postoperative numeric rating score.....	59
Table (11):	Comparison between group I: PEC1 and group II: SAPB according to time of first analgesia (hour).	61
Table (12):	Comparison between group I: PEC1 and group II: SAPB according to Number of patients who received postoperative pethidine 25mg.	62
Table (13):	Comparison between group I: PEC1 and group II: SAPB according to total consumption of pethidine 25 mg during 24hrs.	63
Table (14):	Comparison between group I: PEC1 and group II: SAPB according to side effect.	64

List of Figures

Fig. No.	Title	Page No.
Figure (1):	Skeleton of the thoracic wall	5
Figure (2):	The external and internal intercostal muscles of the thoracic wall	6
Figure (3):	View of the inner aspect of the thoracic wall, featuring internal intercostals, transversus thoracis and diaphragm	7
Figure (4):	Arterial blood supply of the thoracic wall	7
Figure (5):	Typical spinal nerve	8
Figure (6):	Anterior thoracic wall muscles	9
Figure (7):	Anterior thoracic wall muscles relevant to thoracic wall blocks	9
Figure (8):	Muscles That Position the Pectoral Girdle	10
Figure (9):	Cut section in the anatomical landmarks involved in Pecs block. pectoral region	11
Figure (10):	Muscles of the trunk	13
Figure (11):	Pectoralis major muscle has been extracted for better viewing	14
Figure (12):	Boundaries of the breast	15
Figure (13):	Axillary artery and its branches	17
Figure (14):	Schematic representation of the left plexus brachialis	19
Figure (15):	Innervation of the thoracic wall muscles at the axillary level; branches of the spinal innervating the chest wall	20
Figure (16):	PEC 1 block-probe and needle placement	37
Figure (17):	Sonoanatomy PEC 1	37
Figure (18):	PEC 2 block-probe and needle placement	39
Figure (19):	Sonoanatomy PEC 2	40
Figure (20):	Transducer position required for the serratus plane block	42
Figure (21):	Sonogram of two possible levels for the serratus plane block below (left) or above the muscle (right)	42

List of Figures *cont...*

Fig. No.	Title	Page No.
Figure (22):	Bar chart between group I: PEC1 and group II: SAPB according to age (years).....	53
Figure (23):	Bar chart between group I: PEC1 and group II: SAPB according to weight (kg).	53
Figure (24):	Bar chart between group I: PEC1 and group II: SAPB according to duration of surgery (min).	54
Figure (25):	Comparison between group I: PEC1 and group II: SAPB according to mean arterial blood pressure (mmHg).....	56
Figure (26):	Comparison between group I: PEC1 and group II: SAPB according to postoperative heart rate (beat/min).	58
Figure (27):	Comparison between group I: PEC1 and group II: SAPB according to postoperative numeric rating score.....	60
Figure (28):	Bar chart between group I: PEC1 and group II: SAPB according to time of first analgesia (hour).	61
Figure (29):	Bar chart between group I: PEC1 and group II: SAPB according to number of patients who received postoperative pethidine 25mg.	62
Figure (30):	Comparison between group I: PEC1 and group II: SAPB according to total consumption of pethidine 25mg during 24hrs.....	63
Figure (31):	Comparison between group I: PEC1 and group II: SAPB according to side effect.	64

INTRODUCTION

Breast cancer is the most common cancer in women both in the developed and less developed world. In 2012, it represented about 12 percent of all new cancer cases and 25 percent of all cancers in women (*Jain et al., 2020*).

Obviously, this is a very high figure but distribution by age is extremely uneven. It was found that the risk of breast cancer in young women is very small. On the other hand older women (over 40 years old) and particularly in elderly women risk of developing this disease can be very high. More than 95% of all cancers are registered in women over 40 years old (*Hankey et al., 1994; Waks and Winer, 2019*).

Signs and Symptoms:

- 1- The first noticeable symptom of breast cancer is typically a lump.
- 2- Lump may include thickening different from the other breast tissue, one breast becoming larger or lower, a nipple changing position or shape or becoming inverted, skin puckering or dimpling, a rash on or around a nipple, discharge from nipple/s, constant pain in part of the breast or armpit, and swelling beneath the armpit or around the collarbone.
- 3- Breast pain is very common and it's not normally due to cancer.

- 4- Fluid leaking from your nipple.
- 5- Inflammatory breast cancer symptoms.
- 6- Paget's disease of the breast.

(Watson, 2008; Merck Manual of Diagnosis and Therapy, 2003)

Treatment:

Surgery

- Lumpectomy.
- Mastectomy.
- Lymph node removal and analysis.
- Radiation therapy.
- Immunotherapy.
- Hormonal therapy.
- Chemotherapy.

(Surgical Oncology, 2010; McKinney et al., 2020)

Modified radical mastectomy is now a standard surgical treatment for early stage breast cancers. These procedures cause significant acute pain and progress to chronic pain states in 25–60% of cases *(Bakeer et al., 2020)*.

Post mastectomy pain syndrome is defined as chronic continuing for 3 or more months neuropathic pain affecting the axilla medial arm, breast and chest wall after breast cancer surgery, the prevalence of PMPs has been reported to range

from 20% to 68%. It is usually acute nociceptive pain; it occurs as normal response to noxious insult or injury, but some of the patients may also experience neuropathic pain (nerve damage pain) (*Dworkin et al., 2007*).

Beyaz et al. (2016) identified two key risk factors for PMPS among breast cancer surgery patients: Tumor localization in the upper lateral quarter and radiotherapy. Risk factors not related to PMPS risk included age, surgery type, tumor diameter, tumor grade, estrogen and progesterone receptor status, amount of removed sentinel node, the amount of removed lymph node, lymphedema, preoperative neoadjuvant chemotherapy, postoperative chemotherapy, and postoperative hormone therapy.

After the application of ultrasound in anesthetic practice, several interfascial plane blocks have been described. Pec I block involves a hydrodissection of the plane between the pectoral muscles with local anesthetic to block the lateral and medial pectoral nerves, serratus anterior plane blocks performed at the axillary fossa, in which the intercostobrachialis nerve, lateral cutaneous branches of the intercostal nerves (T3–T9), long thoracic nerve and thoracodorsal nerve are located in a compartment between the serratus anterior and the latissimus dorsi muscles, between the posterior and midaxillary lines (*Blanco, 2011*).

AIM OF THE WORK

The aim of this work is to evaluate the effectiveness of ultrasound guided pectoral nerve block (PEC1) versus Serratus Anterior plane block (SAPB) as a postoperative Analgesia in Modified Radical Mastectomy.