Comparative Study between the Effect of Ultrasound Guided Pectoral Nerve Block versus Serratus Anterior Plane Block For Postoperative Analgesia in Modified Radical Mastectomy

Thesis

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Mohamed Abd El-Rahman Abd El-Megeed

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List of Abbreviations

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

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INTRODUCTION

Breast cancer has continued to be the most common cancer afflicting women, accounting for 31% of all new cancer cases in the female population. Every year, thousands of patients undergo surgery in the region of the breast and axilla. Surgery is one of the mainstays of treatment, and a procedure called modified radical mastectomy (MRM) is now a standard surgical treatment for early-stage breast cancers ***(Cancer Research UK, 2013)***.

These procedures cause significant acute pain and may progress to chronic pain states in 25–60% of cases ***(Andersen and Kehlet, 2011).***

Though various risk factors have been suggested, inappropriate acute postoperative pain management has been associated with the development of chronic post-mastectomy pain, a complex post-surgical pain syndrome that may occur following any type of breast surgery ***(Macrae, 2001).***

However, traditional opioid-based analgesia remains the mainstay, different techniques including regional local anaesthetic infiltrations, paravertebral and neuraxial analgesia, anticonvulsants, anti-neuropathic analgesics and NMDA antagonists have all been used either in isolation or in combination ***(Macrae, 2001).***

Post mastectomy pain is usually acute nociceptive pain; it occurs as normal response to noxious insult or injury ***(Dworkin et al., 2007),*** but some of the patients may also experience neuropathic pain (nerve damage pain) ***(Gray, 2008).***

Inadequately controlled pain negatively affects quality of life, functional recovery and increases the risk for postsurgical complications ***(Apfelbaum et al., 2003).***

After the application of ultrasound in anesthetic practice, several interfascial plane blocks have been described recently. Pec 1 block involves a hydrodissection of the plane between the pectoral muscles with local anaesthetic to block the lateral and medial pectoral nerves and serratus anterior plane blocks performed at the axillary fossa, 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. Those are newer US-guided blocks for analgesia after breast and lateral thoracic wall surgery. The key sonographic landmarks are the pectoralis major, pectoralis minor, and serratus anterior muscles and the pectoral branch of the acromiothoracic artery ***(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) for postoperative Analgesia in Modified Radical Mastectomy.

Chapter 1

ANATOMY OF THE THORACIC WALL AND BREAST

For adequate treatment of patients with breast cancer, Anesthesiologists as those responsible for pain management, as well as surgeons, should have a complete understanding of the anatomy of the thoracic wall and breast ***(De la Pared, 2006).***

Anatomy of the thoracic wall:

Skeleton of the thoracic wall is formed by the twelve thoracic vertebra posteriorly, the sternum anteriorly and, on each side, by the twelve ribs and the respective costal cartilage (Fig 1) ***(Gray, 1878)***

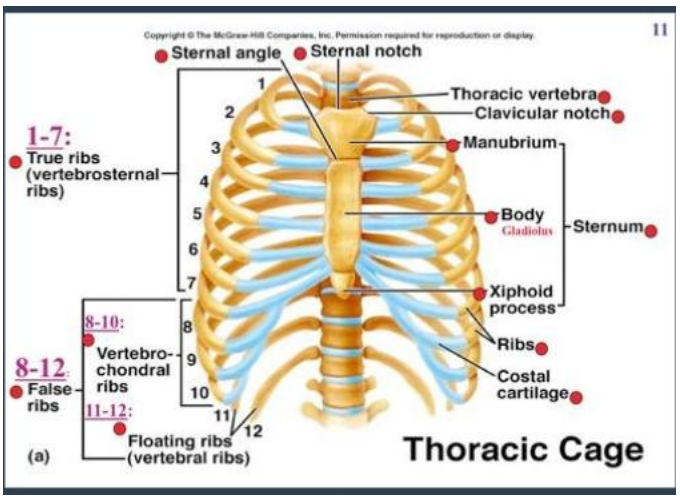

Figure (1): Skeleton of the thoracic wall ***(Vidić, 1984).***

Muscles of the Thoracic Wall:

There are five muscles that make up the thoracic cage; a) *the intercostals (external, internal and innermost)* which fill the spaces between the ribs organized in three layers, b) *subcostals*, and c) *transversus thoracis.*

These muscles act to change the volume of the thoracic cavity during respiration. (Featured in figs.2 and 3).

There are some other muscles that do not comprise the thoracic wall, but do attach to it. These include a) *the pectoralis major, b) pectoralis minor, c) serratus anterior and d) the scalene muscles (fig.2)* ***(De la Pared, 2006).***

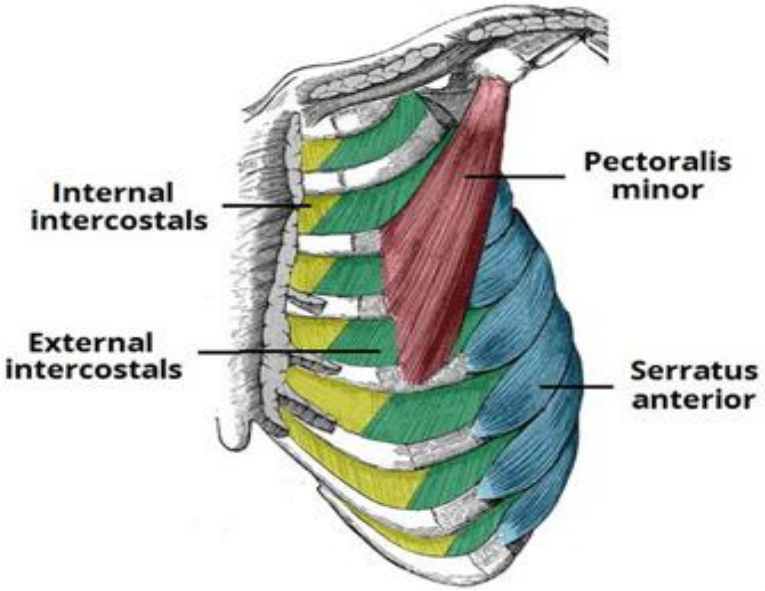

Figure (2): The external and internal intercostal muscles of the thoracic wall ***(Vidić, 1984).***