Postoperative Pain Control for Adult Tonsillectomy; A Comparative Study of Glossopharyngeal Nerve Block Versus Intravenous Lornoxicam

Thesis

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Ahmed Abdel Ghany Khalifa Ragab

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List of Abbreviations

Abbr.	Title
ADRs	: Adverse drug reactions
AUC	: Area under curve
AVP	: Arginine-vassopressin
CNS	: Central nervous system
CPR	: Cardiopulmonary resuscitation
CRH	: Corticotropin-releasing hormone
CVS	: Cardiovascular system
EAA	: Excitatory amino acids
ECG	: Electrocardiography
GABA	: Gamma-amino butyric acid
GI	: Gastrointestinal
HPA	: Hypothalamic-pituitary-adrenal
IQR	: Interquartile range
IV	: Intravenous
LA	: Local anaesthetic
MAP	: Mean blood pressure
NMDA	: N-methyl D-aspartate
NRM	: Nucleus raphe magnus
NSAIDs	: Nonsteroidal anti-inflammatory drugs
PDGF	: Platelet derived growth factor
PGD	: Prostaglandin
PMN	: Polymorphonuclear
RF	: Reticular formation

SD : Standard deviation

SpO2 : Hemoglobin oxygen saturation

SPSS : Statistical package for social science

STT : Spinothalamic Tract

TENS : Transcutaneous electrical nerve stimulation

VAS : Visual analogue scale

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Introduction

Tonsillectomy operation in adults is a simple procedure characterized by short hospital stay or outpatient basis ***(Reiner et al., 1990).***

Postoperative pain is the principal cause of morbidity after tonsillectomy. This pain can affect the patient's nutrition, ability to return to work or school, discharge from the hospital that may thus potentially affect cost, and overall satisfaction with the procedure ***(Ozalevli et al., 2005).***

There remains a need to improve postoperative analgesia in this group of patients, yet a balance is required between the goal of perfect analgesia and the risk of adverse reactions such as bleeding, airway compromising, gastritis and prolonged hospital stay ***(Reuter et al., 2000).***

Many studies were done to differentiate between all modalities available for analgesia whether pharmacological or non-pharmacological techniques through assessment of patient satisfaction, hemodynamics and stress response to pain. A variety of techniques have been described using opioid and non opioid analgesics either intravenously or by local infiltration ***(Stelter et al., 2009).***

As the tonsils receive their nerve supply from branches of the glossopharyngeal nerve so local infiltration of the

nerve with local anesthetics would provide a reasonable way of blocking pain after tonsillectomy with low incidence of complications as compared with other alternatives ***(Park et al., 2004).***

The peri-operative use of nonsteroidal anti-inflammatory drugs (NSAIDs) is a reasonable alternative, as they reduce postoperative pain and have an analgesic sparing effect. However, NSAIDs may also contribute to increased peri-operative bleeding, gastritis and renal impairement ***(Hiller et al., 2004).***

Lornoxicam is a nonselective NSAID of the oxicam class, with analgesic, anti-inflammatory, and antipyretic effects. It is rapidly eliminated and has a short plasma elimination half-life of three to 5 hours. Peri-operative intravenous (IV) administration of lornoxicam reduces post-operative pain after various types of surgery, and it reduces the need for postoperative rescue pain medication. It would provide postoperative analgesia without increasing peri-operative blood loss after tonsillectomy in adults ***(Sener et al., 2008).***

Aim of the work

The objective of this study is to evaluate and compare the use of glossopharyngeal nerve block versus intravenous lornoxicam for postoperative pain control in adult tonsillectomy as regard the efficacy , duration of pain control and side effects.

Anatomical Considerations for Adult Tonsillectomy

☒ Palatine Tonsils

The tonsils begin developing early in the third month of fetal life. They arise from the endoderm lining, the second pharyngeal pouch and the mesoderm of the second pharyngeal membrane and adjacent regions of the first and second arches. The epithelium of the second pouch proliferates to form solid endodermal buds, growing into the underlying mesoderm; these buds give rise to tonsillar stroma. Central cells of the buds later die and slough, converting the solid buds into hollow tonsillar crypts, which are infiltrated by lymphoid tissue ***(William et al., 2001).***

Both right and left tonsils form part of the circumpharyngeal lymphoid ring. The size of the tonsil varies according to the age, individuality, and pathologic status. At the fifth or sixth year of life, the tonsils rapidly increase in size, reaching their maximum size at puberty. At puberty, the tonsils measure 20-25 mm in vertical and 10-15 mm in transverse diameter ***(Susan et al., 2005).***

- ***Anatomic relations:***

Anteriorly and posteriorly, the tonsil is related to the palatoglossus and palatopharyngeus muscles, lying within their respective folds. A few fibers of the palatopharyngeus

are found in the tonsil bed and are attached to the lower part of the capsule along with the fibers of the palatoglossus. Superiorly, the tonsil extends into the edge of the soft palate; inferiorly, the tonsillar capsule is firmly attached to the side of the tongue ***(Reichel et al., 2007).***

On the lateral surface, the tonsil has a thin distinct capsule, which is formed from condensation of pharyngobasilar fascia. This fascia extends into the tonsil itself, forming septa, which allow passage of nerves and vessels ***(Kenna et al., 2009)***.

Deep to the pharyngobasilar fascia, in the upper part of the fossa, is the superior constrictor ; below it is the styloglossus passing forward into the tongue. The buccopharyngeal fascia is situated lateral to the superior constrictor . The glossopharyngeal nerve and stylohyoid ligament pass obliquely downward and forwards beneath the lower edge of the superior constrictor in the lower part of the tonsillar fossa. The paratonsillar vein descends from the soft palate across the lateral aspect of the capsule of the tonsil before piercing the pharyngeal wall to join the pharyngeal plexus ***(Robb and Gleeson, 2008).***

The medial free surface projects into the oropharynx and is covered by a thin layer of stratified squamous epithelium, which extends from the surface deep into the

tonsil, forming crypts. The medial surface has a pitted appearance; each tonsil has 10-20 pits. The openings of the crypts are fissure like, and the walls of the crypt lumina are collapsed and in contact with each other **Figure (1)** ***(Susan et al., 2005)***.

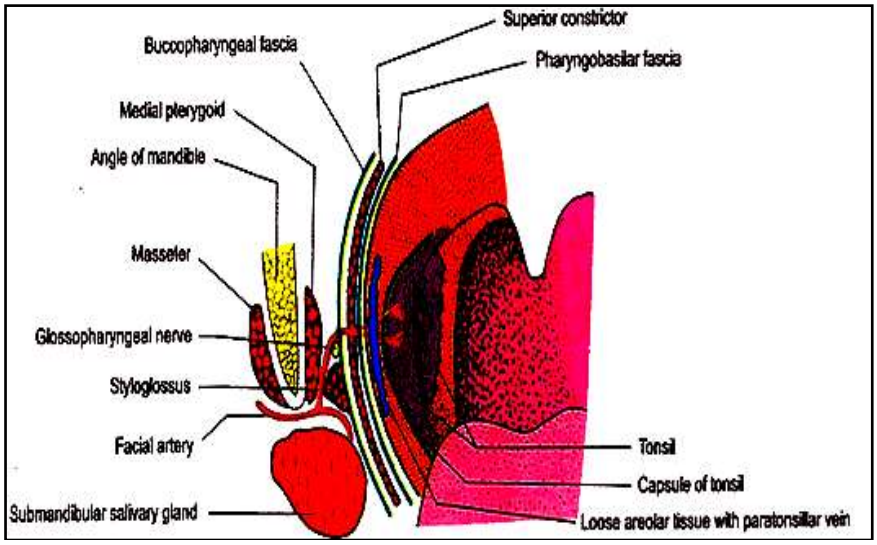

Figure (1): Anatomical relations to palatine tensils ***(Susan et al., 2005).***

- ***Vascular supply***

The arterial supply of the tonsils is derived from the following arteries:

1. Tonsillar artery
2. Ascending pharyngeal artery
3. Tonsillar branch of the facial artery
4. Dorsal lingual branch of the lingual artery
5. Ascending palatine branches of the facial artery

Venous blood drains through a peritonsillar plexus. The plexus drains into the lingual and pharyngeal veins, which in turn drain into the internal jugular vein **Figure (2)** ***(Wiatrak et al., 1998).***

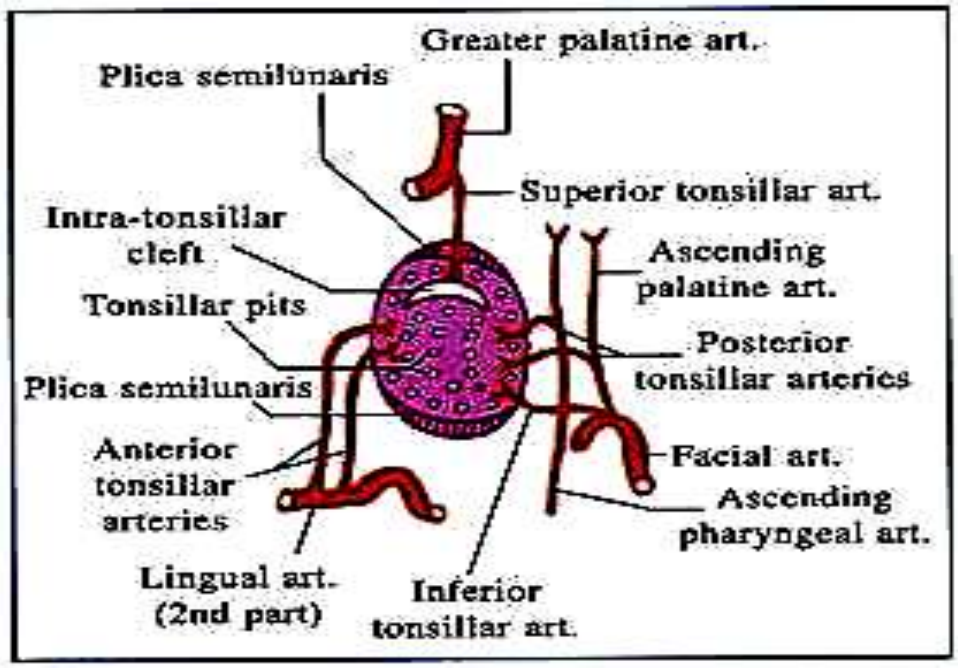

Figure (2): Arterial blood supply of palatine tensils ***(Solomides et al., 2002).***

- ***Nerve supply***

The tonsils are innervated via tonsillar branches of the maxillary nerve and the glossopharyngeal nerve ***(Robb and Gleeson, 2008)***.