A COMPARATIVE STUDY BETWEEN TRUE TUMESCENT LOCAL ANESTHESIA TECHNIQUE AND OTHER CONVENTIONAL ANESTHETIC REGIMENS IN LIPOSUCTION

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الكتاب والحكمة
وعلَّمَكَ مَا لَمْ تَكُن
تَعْلَمُ وكَانَ فَضْلُ
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May Mostafa Darwish Mostafa

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list of Abbreviations

AAGP: Alpha1 acid glycoprotein
ARDS: Acute Respiratory Distress Syndrome
ASA: American Society of Anesthesiologist
BMI: Body Mass Index
CBC: Complete Blood Count
CNS: Central Nervous System
CPR: Cardiopulmonary Resuscitation
CV: Cardiovascular
CYP: Cytochrome P
DVT: Deep Venous Thrombosis
ECG: Electrocardiogram
EtCO2: End-Tidal Carbon Dioxide
Hb: Hemoglobin
Hct: Hematocrit
HIV: Human Immune Deficiency Virus
HR: Heart Rate
ILE: Infusion of Lipid Emulsion
IQR: Interquartile Range
IV: Intravenous
IVRA: Intravenous Regional Anesthesia
LA: Local Anesthetic
LAST: Local Anesthetic Systemic Toxicity
MAC: Minimum Alveolar Concentration
MAC: Monitored Anesthesia Care
MAP: Mean Arterial Blood Pressure
Mcg, µg: Microgram
MLAC: Minimum Local Anesthetic Concentrations
NaCL: Sodium Chloride (Saline)
$NaHCO_3$: Sodium Bicarbonate
NIBP: Non-Invasive Blood Pressure
NS: Normal Saline
NSAIDs: Non-Steroidal Anti-Inflammatory Drugs

List of Abbreviations (*Cont…*)

PABA: Paraminobenzoic Acid
PACU: Post-Anesthetic Care Unit
PONV: Postoperative Nausea And Vomiting
PT: Prothrombin Time
PTT: Partial Thromboplastin Time
SD: Standard Deviation
SpO2: Oxygen Saturation
TL: Tumescent Liposuction
TLA: Tumescent Local Anesthesia
UGRA: Ultrasound Guided Regional Anesthesia
VAS: Visual Analogue Scale
WAL: Water Assisted Liposuction

INTRODUCTION

Liposuction is the most common cosmetic surgical procedure worldwide. The evolution of liposuction over the past decade has been driven by the desire to achieve better aesthetic outcome, provide safety and allow the procedure to be performed in an outpatient facility ***(Stephan and Kenkel, 2010)***.

Liposuction may be performed under general, regional or local anesthesia. The choice of anesthetic technique depends on both the site and extent of liposuction and also patient preference. Since these procedures are often performed as day care, it is important that there is fast recovery of psychomotor and cognitive functions ensuring early discharge of the patient ***(Sood et al., 2011)***.

Historically, liposuction was developed by surgeons who preferred general anesthesia over local anesthesia. As a consequence, the vast majority of liposuction surgeries are still performed with the use of general anesthesia. Other surgeons prefer regional spinal anesthesia due to its safety, low cost and fewer side effects compared to general anesthesia. In both techniques, they infiltrate only relative small amounts of solution with epinephrine to prevent considerable blood loss which is referred to as Semi-tumescent liposuction ***(Regatieri and Masquera, 2006).***

However massive shifts of fluid out of the vascular space into the areas traumatized by the liposuction cannula in addition to blood loss have been the major risk factors in liposuction by these conventional anesthetic techniques ***(Sood et al., 2011)***.

Tumescent liposuction was first introduced in the mid 1980's. This technique eliminated most of the medical and cosmetic problems associated with liposuction that had been encountered with the conventional anesthetic techniques in the earlier years ***(Habbema, 2009).***

The word tumescence means 'to swell'. In this technique, very large volumes (35-55mg/kg) of highly diluted (0.05% to 0.1%) lidocaine with epinephrine 1 mg/L (1:1,000,000) along with additives as sodium bicarbonate are injected into the subcutaneous tissue to expand the tissues, make them firm, swollen and turgid. This creates a plane where suction of fat becomes easier, with less volume of blood loss ***(Sood et al., 2011)***.

The use of Tumescent Local Anesthesia "TLA" as the exclusive method of anesthesia is known as True Tumescent anesthesia. It permits liposuction totally by local anesthesia without the need for general or spinal anesthesia, narcotic analgesia or deep sedation ***(Klein, 2011).***

Several studies have demonstrated the advantages of TLA over other conventional anesthetic techniques in providing minimal blood loss, rapid postoperative recovery, prolonged local anesthesia, improved aesthetic results and decreased both surgical and anesthetic risks. However, strict adherence to basic guidelines and thorough knowledge of the pharmacological mechanism and of the anesthesiologic aspects of the technique are essential to prevent complications related to TLA ***(Svedman et al., 2006)***.

AIM OF THE WORK

The aim of this study is to evaluate and compare between conventional anesthetic methods (semi-tumescent anesthetic technique with either general anesthesia or spinal anesthesia) and True Tumescent Local anesthetic technique used for upper and lower abdominal liposuction procedure in order to know the ideal anesthetic technique providing less blood loss, longer postoperative analgesia, rapid postoperative recovery and less both surgical and anesthetic risks.

Chapter (1)

LOCAL ANESTHETICS

Local anesthetics (LAs) are defined as drugs that reversibly block transmission of a nerve impulse, without affecting consciousness. The medical use of local anesthetic agents began some years after isolating cocaine from Peruvian coca in the 1860s. However, due to cocaine's effect of euphoria, subsequent addiction, and cases of mortality from its clinical use, a drive was created to develop less toxic newer amino esters ***(Ciechanowicz and Patil, 2012).***

Procaine synthesis in 1905 was to dominate LA use for the next 40 years, but due to the slow onset of action and allergic potential of amino esters, the hypoallergenic amino amides gradually forced its path with lidocaine appearing in 1948 which is still the most commonly used LA ***(Ciechanowicz and Patil, 2012).***

The subsequent evolution of LAs use has made a wide expansion in our knowledge of these drugs and in techniques of their administration, although the agents themselves have changed comparatively less. Modern LAs are safer, but still risks persist. The cornerstone of safe practice with LAs is a thorough understanding of their pharmacological and toxicity profiles, in particular, dose and concentration required, speed of onset and duration of action. Clinicians administering