Patient controlled interscalene analgesia using Posterior approach versus lateral approach after major shoulder surgery

THESIS

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بسم الله الرحمن الرحيم

لا يكلف الله نفسا إلا وسعها لها ما كسبت وعليها ما اكتسبت ربنا لا تؤاخذنا إن نسينا أو أخطأنا ربنا ولا تحمل علينا إصرا كما حملته علي الذين من قبلنا ربنا ولا تحملنا مالا طاقة لنا به واعف عنا واغفر لنا وارحمنا أنت مولانا فانصرنا علي القوم الكافرين

صدق الله العظيم
سورة البقرة آية ٢٨٦

عن عبد الله بن زياد البحراني عن علي بن زيد عن سعيد بن المسبب عن أبي ذر قال قال لي رسول الله صلي الله عليه وسلم قال له يا أبا ذر لآن تغدو فتعلم آية من كتاب الله خير لك من أن تصلي مائه ركعة ولآن تغدو فتعلم بابا من العلم عمل به أو لم يعمل خير من تصلي ألف ركعة

صدق رسول الله صلي الله عليه وسلم
سنن بن ماجه باب العلم

DEDICATION

TO:

Allah and the Prophet Muhammad (peace upon him) ….

The real love in my life.

My dear parents ….

The first teachers in my life.

My mother and father – in – law ……

The real support in my life.

My lovely wife ……

The first and the last companion in my life

Mohamed Ibraheem Mohamed 

Abstract

Objective: Management of postoperative pain especially in shoulder surgery is very important because it will improve the result of the surgery, patient satisfaction, and allow painless physiotherapy.
Continuous interscalene brachial plexus blockade can provide anesthesia and analgesia in the shoulder region.

The purpose of this study: is to investigate the effect of the interscalene brachial plexus block (classical approach of Winne) and paravertebral approach on pain relief, vital signs, oxygen saturation , arterial blood gases, pulmonary functions, stability of the catheter in its site .

Patent and Methods: The study was conducted on 80 adult patients admitted to Al Razi orthopedic hospital in Kuwait complaining of special problems in the shoulder region and indicated for surgery.
Patients were allocated randomly into one of 2 groups:
Group I: Lateral group (n = 40) using the classical approach of Winne
Group II: Posterior group (n = 40) using paravertebral interscalene brachial plexus approach .

The level of pain relief was assessed by Visual Analogue Scale (VAS), measurement of pulmonary function test, arterial blood gases, vital signs, oxygen saturation. Stability of the catheter in its site will be assessed by plain X Ray after dye injection and side effects, were recorded and analyzed.

Key Words :
Major Shoulder Surgery – interscalene analgesia using .

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Introduction

Introduction

Management of acute postoperative pain due to shoulder surgery may be successfully and consistently achieved in ambulatory patients by using continuous interscalene block.(1). This study describe the outlines of the anterior and posterior approaches to the proximal brachial plexus and describes a method of precisely placing a catheter along the brachial plexus by stimulating the plexus through the needle used for placing the catheter as well as through the catheter itself (2) .

Advantages of intraoperative use of regional anesthesia includes, better pain control, regional techniques can block and reduce pain anywhere from several hours to several days, depending on the technique used. Preemptive pain management may reduce subsequent pain in the days to weeks following surgery. Better pain control has the potential to allow earlier hospital discharge and may improve the patient's ability to tolerate physical therapy(3).

Continuous brachial plexus blocks started with the work of Ansbro in 1946 (4), followed by many different techniques. Most of these early methods were hampered by inaccurate catheter placement or catheter dislodgement. In order to provide reliable analgesia for ambulatory shoulder surgery and prevent readmission due to failed catheter placement, it was necessary to develop a method to assure real-time catheter position. This can be done immediately and not hours later when the initial block had worn off (5,6). This was combined with a method to secure the catheter so that it does not dislodge, adopted from work on long-term epidural catheterization (5). A catheter with an inner steel spring capable of conducting electrical impulses to its distal end – a “stimulating catheter” is used for the method described in this study (Arrow StimuCath™, Arrow International, Reading, PA, USA) (7).

▪ The most common shoulder disease which require surgical interference:

▪ Acromioclavicular Joint Separations:

The acromioclavicular (AC) joint is a diarthrodial articulation with an interposed fibrocartilaginous meniscal disk that links the hyaline cartilage articular surfaces of the acromial process and the clavicle. The joint is stabilized by a combination of dynamic muscular and static ligamentous structures, which allow a normal anatomic range of motion. Because of the transverse orientation of the articulation, direct downward forces may result in shear stresses that cause disruption of these stabilizing structures and create displacement beyond the normal limits. This is evidenced by abnormal positioning of the clavicle relative to the acromion, usually in the superior direction.(8).

▪ Adhesive Capsulitis:

The terms adhesive capsulitis and frozen shoulder syndrome (FSS) have been used to describe an array of clinical conditions, including subacromial bursitis, calcifying tendinitis, and partial rotator cuff tears. Despite the diverse nomenclature used to describe FSS, all of these terms denote different clinical conditions that may cause the painful restriction of active and passive glenohumeral and periscapular shoulder motion.(9).

▪ Anterior Glenohumeral Instability:

The shoulder is the most commonly dislocated joint in the body. When shoulder dislocation occurs in adolescents and children, it has the worst natural history of any injury; the rate of recurrence in later years is at least 70%. As many as 95% of shoulder dislocations are anterior. Anterior dislocations often lead to recurrent anterior glenohumeral instability(10). Recurrent anterior glenohumeral instability accounts for the largest portion of the shoulder laxity spectrum. Excessive deviation of the humeral head on the glenoid occurs in all or 1 of 3 directions: anterior, posterior, or inferior. Although

certainly not life threatening, recurrent subluxation or dislocation is clearly lifestyle threatening and can effectively disable an otherwise active individual (11).

Glenohumeral Arthritis:

The glenohumeral joint normally functions through a wide range of motions in a smooth congruent fashion. When the articular surfaces of the humeral head or the glenoid are damaged, the smooth fluid motion is compromised, and arthritis commonly is the result(12).

- **Shoulder Dislocations:**

Shoulder dislocations account for almost 50% of all joint dislocations. Most commonly, these dislocations are anterior (90-98%) and occur due to trauma. Most anterior dislocations are subcoracoid in location. Subglenoid; subclavicular; and, very rarely, intrathoracic or retroperitoneal dislocations may occur(13).

- **Total arthroplasty of the shoulder surgery** :

Which done in sever end stages from the severe osteoarthritis of the shoulder joint, sever form from fracture dislocation shoulder joint and most of the end stages shoulder problems (14).


Anatomy

Anatomy

▪ The Posterior Triangle of the head and the neck:

The term posterior triangle is a little misleading as it lies on the anterolateral aspect of the neck .It is also a very narrow triangle until its borders are drawn aside . Nevertheless, it serves as a good anatomical approach to a number of structures which are present in the posterior triangle of the head and neck to understand the site of brachial plexus in relation to the other important structure in this area **Fig** [1,2] .

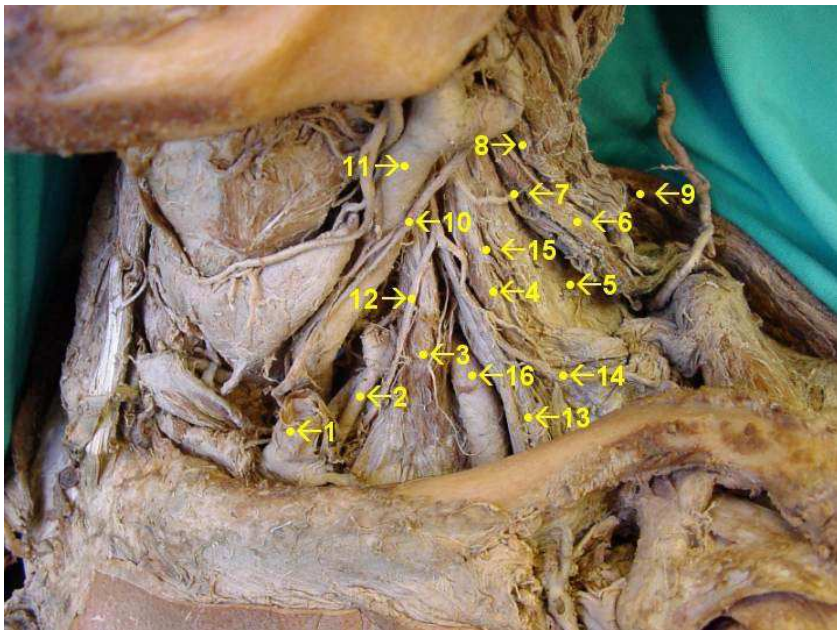

Fig.*[1]:* *A view of the anatomy with the sternocleidomastoid muscle removed shows the position of the* ***internal jugular vein (1)*** *(cut off here). Deep to the internal jugular vein is* ***the thoracic duct (2)*** *on the left side of the neck and adjacent to that the* ***anterior scalene muscle (3)****. Posterior to that is the* ***middle scalene muscle (4)*** *and more posterior, the* ***posterior scalene muscle (5)****. Posterior to the posterior scalene muscle is the* ***levator scapulae muscle (6)*** *with the* ***nerve to the levator scapulae muscle (7)****. The* ***accessory nerve (8)*** *as well as the* ***trapezius muscle (9)*** *can be seen. Also note the* ***vagus nerve (10)****, which is situated in close relationship to the* ***carotid artery (11)****, and the* ***phrenic nerve (12)****, which is situated on the belly of the anterior scalene muscle (3). The* ***brachial plexus (13)*** *is situated between the anterior and middle scalene muscles. The* ***suprascapular nerve (14)*** *and the* ***dorsal scapular nerve (15)*** *(which innervates the rhomboid muscles) branches from the brachial plexus. Note that the* ***subclavian artery (16)*** *lies anterior to the brachial plexus . pass into the upper limb*