THEME

Riding the Waves of Change

19 - 22 April 2012

The Zenith Hotel

Kuantan, Pahang, Malaysia

Continuous catheter block: US stimulating vs non stimulating technique

Mafeitzeral Mamat

Anaesthesiology & Critical Care

UiTM

UNIVERSITI TEKNOLOGI MARA


PERTH


Victoria Square Entrance
Royal Perth Hospital
TAXI
131330

Royal Perth Hospital

- 1829
- 855 bed main WA Tertiary Hospital
- 73 000 patients per year
- Anaesthesia & Pain Medicine Department
- 48 Consultants, 45 Registrars, 4 residents, 2 interns
- Alumni Malaysia!!

U/S Guided Peripheral Nerve Block : Royal Perth Hospital

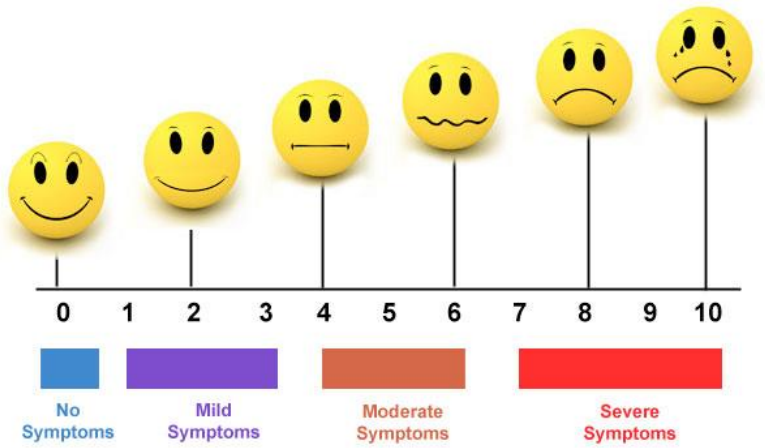
- Perioperative analgesia combined with GA
- Mainly for for orthopaedic traumas and elective joints
- General surgery (TAP block)
- Thoracic (Paravetebral)
- Catheter: 489 (2011 audit)

Protocol

- Standard infusion Ropivucaine 2mg/ml
- PCRA
- Background 8ml/h
- Bolus dose 4ml
- Lockout 1 hour
- NCRA

Multimodal

- Paracetemol
- NSAIDS/coxibs
- Tramadol
- Oxycodone
- pregabalin



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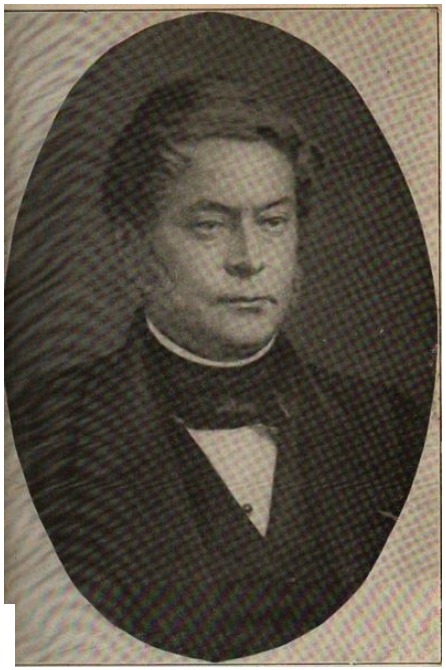
- The first attempt at peripheral nerve blockade was by Dr Francis Rynd, in Dublin in 1845 using subcutaneous injections to treat neuralgia



- 1885, Dr William Stewart Halsted, a New York surgeon, demonstrated the first peripheral nerve blockade using cocaine.

In 1911, Hirschel described the first percutaneous approach to the brachial plexus.

His axillary approach involved injection both below and above the axillary artery.

Hirschel G: Anaesthesia of the brachial plexus for operations on the upper extremity. *Med Wochenschr* 1911; 5:1555-1960.

In 1911 as well, Kulenkampff in Germany described the first “blind” supraclavicular approach to blocking the brachial plexus.

Interestingly, he perfected his technique by trying the block on himself

Kulenkampff D: Die Anasthesia des plexus brachialis. *Zentralbl Chir* 1911; 38:1337.

L'ANESTHÉSIE RÉGIONALE

PAR

VICTOR PAUCHET,
Professeur à l'École de Médecine d'Amiens.

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Ancien Interne des Hôpitaux de Paris, Chirurgien des Hôpitaux d'Amiens.

ET

JULES LABOURÉ, d'Amiens.
(Anesthésie de la face et du cou.)

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Avec 220 figures dans le texte.

PARIS
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1917

Regional Anesthesia

Its Technic and Clinical Application

By

Gaston Labat, M. D.

Laureate of the Faculty of Sciences, University of Montpellier, France; Laureate of the Faculty of Medicine, University of Paris, France; Clinical Professor of Surgery, New York University and Bellevue Hospital Medical College; Clinical Professor of Oral and Minor Surgery, in charge of Regional Anesthesia, New York University College of Dentistry; Visiting Regional Anesthetist, The Presbyterian Hospital, New York City; formerly Special Lecturer on Regional Anesthesia, The Mayo Foundation, University of Minnesota; Consultant in Regional Anesthesia, The Woman's Hospital, New York Orthopedic Hospital, Mount Sinai Hospital

With a Foreword by

William J. Mayo, M. D.

Second Edition, Revised
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Original Illustrations

PHILADELPHIA AND LONDON

W. B. SAUNDERS COMPANY

1928

- 1973 Montgomery, Raj: nerve stimulator in contemporary practice
- Rawal, Fisher, Pinnock.
- 1985 Birth of ultrasound imaging into regional anaesthesia practice

Ansboro F: Method of continuous brachial plexus block.

Am J Surg 1946; 71:716-722.

The Effect of Stimulating Versus Nonstimulating Catheter Techniques for Continuous Regional Anesthesia

A Semiquantitative Systematic Review

Astrid M. Morin, DEAA, MD, Peter Kranke, MD,† Hinnerk Wulf, MD,**
*Rudolf Stienstra, MD, PhD,‡ and Leopold H.J. Eberhart, MD**

Conclusions: Published reports of randomized controlled trials provide evidence for a better analgesic effect from stimulating catheters. Future trials should be conducted in a standardized manner with uniform reporting of outcomes, which may facilitate future quantitative analysis.

(*Reg Anesth Pain Med* 2010;35: 194–199)

Combined ultrasound guided technique with nerve stimulating catheter?

- Logically sounds more convincing for precision & quality
- Why not?

Dhir S, Ganapathy S. Comparative evaluation of ultrasound-guided continuous infraclavicular brachial plexus block with stimulating catheter and traditional technique: a prospective-randomized trial. Acta Anaesthesiol Scand 2008;52:1158-66.

- High false negative rate (85%)
- Inability to stimulate
- 95% successful secondary block

Looks great, sounds great…

- Technically challenging
- Major premise of false negative
- Poor visuals
- Multiple ancillary methods of confirmation*
- Outcome? Practicality?

Journal of Clinical Anesthesia

Journal of Clinical Anesthesia (2011) 23, 626–631

The effect of stimulating versus conventional perineural catheters on postoperative analgesia following ultrasound-guided femoral nerve localization☆,☆☆,★

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Received 23 May 2010; revised 5 April 2011; accepted 22 April 2011

Abstract

Study Objective: To test the hypothesis that, if the femoral nerve is correctly localized using ultrasound (US) guidance, the type of perineural catheter used has no effect on catheter success.

Design: Randomized controlled trial.

Setting: Post-anesthesia care unit of an academic teaching hospital.

Patients: 40 ASA physical status 1, 2, and 3 patients, ages 55-85 years, undergoing elective total knee arthroplasty.

Interventions: All patients received postoperative continuous femoral nerve blocks and a single injection sciatic nerve block. Nerve localization was accomplished using US guidance and electrical nerve stimulation so that the needle tip was visualized deep to the femoral nerve. Patients were randomized to receive either stimulating (Group SC) or nonstimulating catheters (Group NSC) in the usual manner for each device. Catheters were bolused with ropivacaine and an infusion commenced.

Measurements: The primary outcome was quality of analgesia (as measured by a numerical rating scale). Other outcomes included sensory block success rate, number of attempts and time required to localize the needle tip correctly, number of attempts and time required to place the perineural catheter, amount of local anesthetic and opioid use postoperatively, and degree of completion of preset postoperative rehabilitation goals.

Main Results: Quality of analgesia was similar at all time intervals. Rates of successful femoral block (95% vs 80%; $P = 0.34$) were similar between groups. Time required to position the catheter was greater in Group SC than Group NSC (3.45 ± 2.05 min vs 1.72 ± 0.88 min; $P < 0.01$).

Journal of Clinical Anesthesia

Journal of Clinical Anesthesia (2011) 23, 626–631

Conclusions: Ultrasound guidance for needle localization prior to catheter insertion for femoral nerve block results in similar block characteristics between stimulating and nonstimulating catheters. The use of nonstimulating catheters avoids the technical challenges of stimulating catheters and does not require additional helpers.