Enoxaparin and Warfarin for VTE Prophylaxis in THA: To Bridge or Not to Bridge?

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Temple Research Day

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Introduction

• There is significant controversy regarding the optimal anticoagulation regimen following THA

• Current JAAOS Guidelines
  – “we suggest the use of pharmacologic agents...for the prevention of VTED in patients undergoing arthroplasty...we are unable to recommend for or against specific prophylactics”\(^1\)

Chemical Anticoagulation

• Many agents available
  – Aspirin
  – Heparin
  – Enoxaparin
  – Warfarin
  – Rivaroxaban (Xarelto)
Background

• When no prophylaxis against VTE used:
  – 51% DVT\textsuperscript{2}
  – 2% fatal pulmonary embolus\textsuperscript{3}

Background

• Meta-analysis: 4
  – Proximal and distal DVT reduced with any agent vs. placebo (48.5%)
  – Symptomatic pulmonary embolus
    • Warfarin (0.16%)
    • LMWH (0.36%)
    • Placebo (1.51%)
  – LMWH: associated with a higher incidence of minor bleeding complications

The Temple Experience

• Coumadin – most frequent agent used after THA

• Lovenox – used as a bridge in certain “high-risk” individuals
  – History of thromboembolic event
  – Family history
  – Other risk factors, ie malignancy, obesity
  – Peripheral edema
“Bridged Therapy”

- Anticoagulation “Bridges”
  - Often used to enhance chemoprophylaxis against thromboembolic disease
  - Hypercoaguuable state in early warfarin treatment
  - Enoxaparin is often used in the early phases of post-op treatment until the International Normalized Ratio (INR) is within therapeutic range
Study Purpose

• Compare patients who received warfarin-only treatment to another group who received coumadin bridged with enoxaparin

• Outcomes of interest:
  – Length of hospital stay
  – Days until wound dry
Methods

• 121 total hip arthroplasty procedures performed between Jan. 1, 2008 and Dec. 31, 2009

• 63 “bridged”/58 “non-bridged”

• Propensity scores calculated to produce more accurate analysis
  – Creates an “idealized” situation whereby the two groups are matched in regard to several variables
    • Age, Gender, Sex, Diabetes, BMI
Methods

• Propensity Score matching
  – Creates a situation where any differences detected can be attributed to the variable of interest alone
  – Pairs patients from one group with an “identical” patient in the other group

• After optimal matching
  – 31 non-bridged patients
  – 31 bridged patients
Results

- Figure 1: Days Until Wound Dry:
  - On average, the bridged therapy group required 3.06 days before wound found to be dry.
  - The warfarin-only group required only 1.13 days
  - P value < 0.05
  - OR = 2.39
Results

• Figure 2. Days until Discharge:
  – Patients on bridged therapy had average hospital stay of 5.81 days
  – Patients on warfarin-only therapy had average hospital stay of 4.61 days
  – P value < 0.05
  – OR = 1.27
Incidence of Pulmonary Embolus

Bridged Group
• 1 patient

Warfarin-only Group
• 0 patients
Discussion

• Many surgeons will bridge routinely or in select patients:
  – There is no evidence that this protects against thromboembolic disease in patients undergoing THA.
  – Our study supports this
    • 1 PE in bridged group
    • 0 PE in non-bridged group
What is the “Lovenox Leak”?

- Enoxaparin has been shown to result in prolonged wound drainage following THA\(^5\)
  - The use of LMWH is associated with prolonged wound drainage in THA compared to warfarin or aspirin alone

Discussion

• The addition of a “Lovenox Bridge” adds significant cost
  – Additional cost accumulated as a result of longer hospital stays
Discussion

• Strengths
  – Lack of literature looking specifically at the use of Lovenox bridges in THA
  – Matched controls
Discussion

• Weaknesses:
  – Retrospective
  – Small number of patients
  – Inexact method for measuring wound drainage
  – Insufficient follow-up
  – Insufficient data regarding need for secondary procedures, occurrence of periprosthetic infection
Thank You

Questions?