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#### The Effect of Pre-operative Coumadin Therapy on Patients Who Develop Hemorrhagic Events Post Bariatric Surgery

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# The Effect of Pre-operative Coumadin Therapy on Patients who Develop Hemorrhagic Events Post Bariatric Surgery

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# Background

- Lehigh Valley Hospital Health Network (LVHN), a non-profit tertiary care facility in Allentown, Pennsylvania is a Level 1 accredited Bariatric Surgery Center performing over 375 procedures annually.
- LVHN joined the American College of Surgeons National Surgical Quality Improvement Program (ACSNSQIP) in May 2006.
- The Agency for Healthcare Research and Quality (AHRQ) estimates that 2 million patients are managed on Coumadin or other anticoagulants yearly.
- As the incidence of obesity in America continues to increase, the number of patients undergoing weight loss procedures is concurrently rising (16,000 surgeries performed annually in 1990 climbed to about 140,000 in 2005).
- Patients on chronic anticoagulant therapy who undergo bariatric surgery represent a unique patient population.
- In our institution, the practice pattern had been to return patients to their pre-operative anticoagulation regime at the time of discharge following bariatric surgery.
- We evaluated patients on pre-operative anticoagulation undergoing bariatric surgical procedures who developed hemorrhagic complications.

#### Methods

- A retrospective chart review was performed on all LVHN bariatric surgery cases entered into the American College of Surgeons Bariatric Surgery Center Network (ACSBSCN) database from 4/1/2008-9/30/2011.
- Patients identified as being on pre-operative anticoagulation were stratified according to type of surgery and indication for anticoagulation.
- Date of readmission, reason for readmission, and initial INR levels were collected on those patients who were readmitted in less than 40 days and diagnosed with post procedure hemorrhage.

### Results

- Patient population
  - 1338 patients underwent bariatric surgery
    - 43 were on Coumadin or Antiplatelet therapy
  - 133 patients were readmitted
    - 25 patients were diagnosed with post-operative hemorrhage
      - 10 of 25 were patients on pre-op anticoagulation/antiplatelet therapy

Table 1. Hemorrhage Readmissions				
	Total Patients	Total Readmissions	Hemorrhage Readmissions	% of Readmits due to Hemorrhage
All Patients	1338	133 (9.9%)	25 (1.9%)	18.8%
Non-Anticoagulated Patients	1295	123 (9.4%)	15 (1.2%)	12.2%
Coumadin/Antiplatelet Patients	43	14 (32.6%)	10 (23.3%)	71.4%

#### Table 2. Summarization of Patients Readmitted With a Hemorrhagic Event Indication for Type of Surgery Anticoagulation AB wall hematoma Prior DVTs 1.3 + LMWH\* GI Bleed/Melena Atrial Flutter GI Bleed/Melena **Atrial Fibrillation** GI Bleed/Melena 5.6 Gi Bleed/Melena Factor V Leiden GI Bleed/Ulcer Prior DVT GI Bleed/Melena Atrial Flutter GI Bleed/Melena 35 **Atrial Fibrillation** 4.3 36 Prior DVTs Hematuria GI Bleed/Melena **CAD** with Stents **LRNY**

LRNY = laparoscopic gastric Roux-n-y, LGB = laparoscopic gastric band

\* Low Molecular Weight Heparin

This preliminary data is the first to demonstrate a clear trend of post-operative coagulopathy following bariatric surgery in patients on chronic pre-operative Coumadin or Antiplatelet therapy.

## Discussion

Our data demonstrated a baseline 9.9% readmission rate for our entire population (n=1338). Of readmissions, 18.8% (n=25) were readmitted for bleeding symptoms. In the Coumadin/Antiplatelet population (n=43), a baseline readmission rate of 32.6% was observed. In 71.4% of these cases (n=10), bleeding symptoms were the cause for re-presentation. Intra-luminal bleeding pervaded as the most frequent expression of hemorrhage.

Most symptomatic patients presented greater than 10 days post-operatively with a mean INR of 5.8. Possible explanations for coagulopathy include altered drug metabolism or changed volume of distribution (after rapid weight loss), altered vitamin K dynamics (absorption, intake, or storage), peri-operative medication interactions, and altered dietary intake etc. Patients presenting earlier post-operatively with, an immediate increase in INR could represent a drug-drug interaction or dietary factors while a delayed jump in the INR could fit with depleted vitamin K stores that are being under-replaced.

# Summary

- We identified a trend toward post-operative coagulopathy as captured by readmission rate.
- There is no defined explanation for the development of post-operative coagulopathy in this population. Potential causes are drug interaction, diet modification, body habitus change.
- These hypotheses have not been tested. The investigators have initiated a follow-up study to acquire data to this purpose.

## Conclusion

 Based on our preliminary findings, we recommend discharging patients on decreased Coumadin dose, checking INR within 48-72 hours of discharge, and vigilant INR monitoring for several weeks postoperatively.

A PASSION FOR BETTER MEDICINE."

