Anticoagulation after Radiofrequency Transcatheter Ablations

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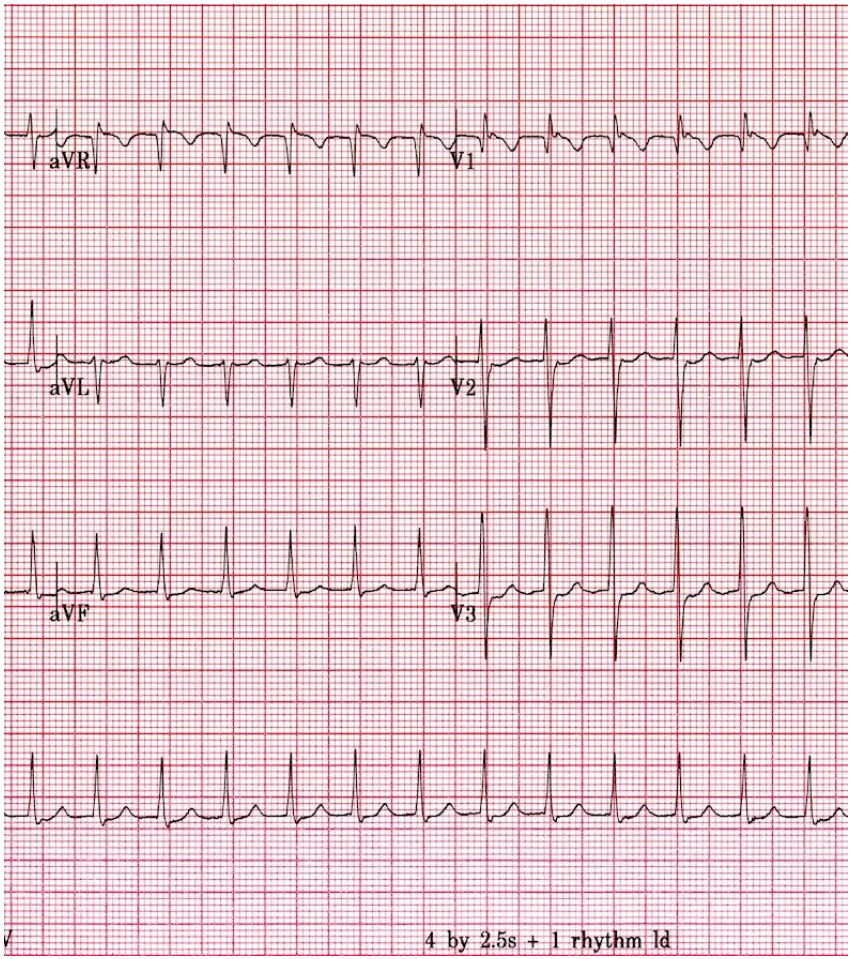
Background

- Radiofrequency transcatheter ablations are used frequently to treat and diagnose arrhythmias in pediatrics and adults
  - Thromboembolic events have been documented
  - Historically at BCH unfractionated heparin (UFH) has been administered overnight to anticoagulate patients



Pros and Cons of UFH

Pros

- Completely reversible using protamine
  - Dosing based on time since last heparin administration
- Half Life: mean 1.5 hours

Cons

- Dosing is not one size fits all…especially for UFH
- Inconsistencies in monitoring d/t differences in reagents
- Lengthy time to therapeutic range
- Discomfort for patients

Change in Practice

- A multidisciplinary group formed to look at best practice for anticoagulation following ablations since patients were found not to be therapeutic on heparin
- Starting in October 2014, left sided ablation patients received a single dose of low molecular weight heparin (LMWH) two hours post hemostasis instead of UFH

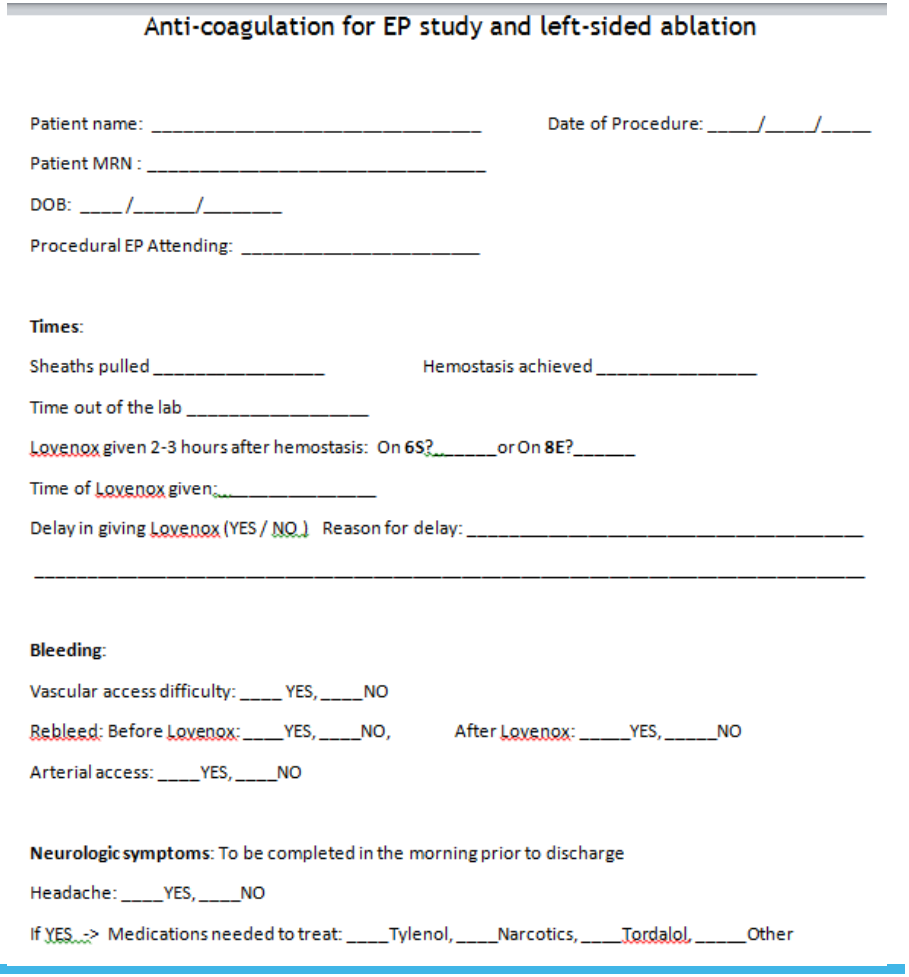
Data Collection

- Standardize documentation was collected from October 2014 to October 2015
  - Completed by RNs and MDs
  - Timing of LMWH administration

  Known possible complications
  - Occurrence of post procedural re-bleeds
  - Evidence of neurological symptoms

Data Collection

- Data was analyzed and compared with the previous eight months prior to initiation of change in practice



Anti-coagulation for EP study and left-sided ablation

Patient name: _____ Date of Procedure: _____/_____/_____

Patient MRN : _____

DOB: _____/_____/_____

Procedural EP Attending: _____

Times:

Sheaths pulled _____ Hemostasis achieved _____

Time out of the lab _____

Lovenox given 2-3 hours after hemostasis: On **6S**?_____or On **8E**?_____

Time of Lovenox given:_____

Delay in giving Lovenox (YES / NO) Reason for delay: _____

_____

Bleeding:

Vascular access difficulty: _____YES, _____NO

Rebleed: Before Lovenox: _____YES, _____NO, After Lovenox: _____YES, _____NO

Arterial access: _____YES, _____NO

Neurologic symptoms: To be completed in the morning prior to discharge

Headache: _____YES, _____NO

If YES -> Medications needed to treat: _____Tylenol, _____Narcotics, _____Tordalol, _____Other

Findings

- No difference in re-bleeds between the two cohorts

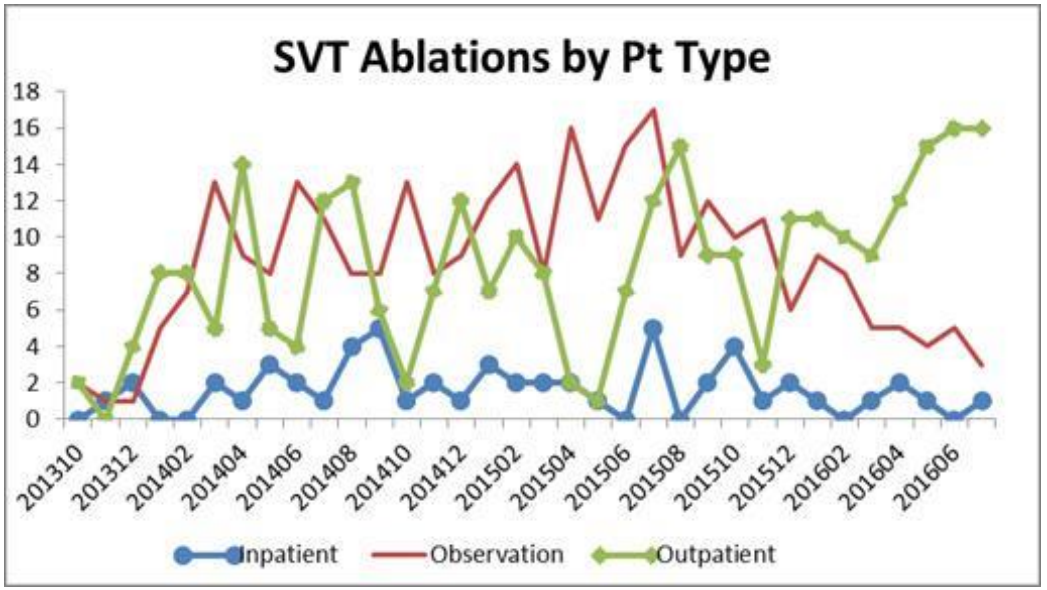
Re-bleeds: N (percent)	UFH	LMWH
Total	5 (0.08)	5 (0.08)
Pre anti-coagulation	1 (0.02)	1 (0.02)
Post anti-coagulation	4 (0.06)	4 (0.06)
Needing Intervention	0	0

Discussion

- LMWH administration is safe and efficacious for patient s/p ablation
- 70% of these patients could have been sent home instead of being kept overnight for observation

Patient Experience and Resource Utilization

- Since change in practice, 10 patient bed days saved per month
- Approximately 24% cost savings per patient



Limitations of Study

- Small cohort of patients
- The average patient was 14-16 yo
- Single center experience
- Data collection was largely qualitative

References

- Cannon, B. C., N. J. Kertesz, R. A. Friedman and A. L. Fenrich (2001). "Use of tissue plasminogen activator in a stroke after radiofrequency ablation of a left-sided accessory pathway." J Cardiovasc Electrophysiol **12**(6): 723-725.

- Epstein, M. R., L. D. Knapp, M. Martindill, J. A. Lulu, J. K. Triedman, H. Calkins, S. K. Huang, E. P. Walsh and J. P. Saul (1996). "Embolic complications associated with radiofrequency catheter ablation. Atakr Investigator Group." Am J Cardiol **77**(8): 655-658.

- Jia, Z., Tian, G., Ren, Y. et al. J Transl Med (2015). Pharmacokinetic model of unfractionated heparin during and after cardiopulmonary bypass in cardiac surgery. doi:10.1186/s12967-015-0404-5

- Thakur, R. K., G. J. Klein, R. Yee and M. Zardini (1994). "Embolic complications after radiofrequency catheter ablation." Am J Cardiol **74**(3): 278-279.

Contact

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