DEEP VENOUS THROMBOSIS PROPHYLAXIS DURING LAPAROSCOPIC SURGERY

RISK STRATIFICATION

Operative factors – Laparoscopic surgery of all types causes serum hypercoagulability of varying degrees (level I, II evidence). Less complex and Shorter (less than one hour) laparoscopic procedures such as simple laparoscopic cholecystectomy probably have low risk of VTE disease (level III evidence). Longer/complex laparoscopic procedures such as laparoscopic Roux-en-Y gastric bypass are higher risk, (level II evidence). Although patient positioning may change DVT risk, there is not enough significant proof to suggest that DVT prophylaxis should be altered based on body position alone.

Patient factors – Age, immobility, history of venous thromboembolism (VTE), varicose veins, malignant disease, severe infection, chronic renal failure, > three pregnancies, peri-pregnancy, CHF, history of MI, inflammatory bowel disease, hormone replacement therapy, oral contraceptive use, and obesity all increase risk (level II evidence). Inherited or acquired thrombophilia (e.g., protein C or S deficiency, factor V Leiden, antithrombin deficiency) greatly increase risk (level II evidence). A strong family history of clotting complications should be inquired about, and may also influence prophylactic treatment strategy.

PROPHYLACTIC METHODS

Unfractionated heparin (low dose UH) – The dose is 5000 U given subcutaneously. Within two hours of operation this should be started (evidence level II) and then every 8 hours. Every 8 hours is probably more effective at preventing VTE with similar risk of major bleeding (level II evidence). Continuous infusion of unfractionated heparin is as effective as the subcutaneous route but has an increased risk of major bleeding and also requires hemodynamic monitoring (level III evidence).

Low molecular weight heparin (LMWH) – on the manufacturer the dose and frequency for LMWH depends, and should be used according to their recommendations, although patient weight may also be a factor. One trial in the morbidly obese showed a need for increased LMWH (level III evidence). With a similar risk of major bleeding LMWH is at least as effective as low dose UH (level II evidence). There is decreased dosing schedule and decreased risk of heparin induced thrombocytopenia with LMWH compared to UH. Most studies start dosing the night before surgery with no other preoperative dosing to decrease the risk of operative bleeding. One trial showed no increase of operative bleeding when given two hours preoperatively versus the night before (level I evidence). When using LMWH with epidural or spinal anesthesia special consideration needs to be given because of the risk of causing hematoma during placement or removal of the catheter (level II evidence).

Pneumatic compression devices (PCD) - calf length pneumatic compression devices seem to offer the same protection for VTE as LMWH or low dose heparin (level II evidence). Foot pneumatic compression devices increase lower extremity venous blood flow and cause fibrinolysis to the same extent as calf length devices and seem to have similar benefit to calf length (level III evidence). With obese patients Foot compression devices are often used because calf length may not fit properly. With pneumatic compression devices there is no increased risk of bleeding and therefore little risk of use. There are no data to support the use of PCDs on only one extremity or the upper extremities during laparoscopic surgery.

Combination therapy – LMWH or low dose UH with PCDs may decrease the risk of VTE even more than the single line therapy (level II evidence).

IVC filters – patients with high risks have been used these procedures. Patients with venous stasis disease, BMI>59, truncal obesity, and hypoventilation syndrome or deep venous or mesenteric venous bypass with good results (level III evidence) There are retrievable filters that can be placed peri-operatively and removed up to a year later or left in place. If filters are left in place, low dose coumadin or equivalent anticoagulation is recommended to prevent IVC thrombosis and pulmonary embolus caused by the filter (level III).

Compression stockings, Coumadin – for the prevention of VTE, these are inferior methods (level III evidence). Presumably, compression stockings do not create sufficient pressure to prevent stasis in the deep leg veins or alter lower extremity blood flow and fibrinolysis. The anticoagulative effect of coumadin alone starts too late to prevent DVT if given immediately prior to the surgical procedure.

It has remained controversial Length of treatment. We recommend treatment until patients are fully mobile or until discharge from the hospital, unless the patient has an acquired hypercoagulable state, then treatment for two weeks or more may be prudent (level III). In determining an appropriate treatment, Consultation with a hematologist may be helpful strategy in these instances.

CONTRAINDICATIONS

Contraindications to anticoagulation therapy for VTE prophylaxis will vary depending on the clinician’s assessment of the risk-benefit ratio. The clinician should refer to individual manufacturer recommendations for specific therapy, and utilize sound clinical judgment regarding the decision to withhold prophylactic therapy.

APPENDIX A: Levels of Evidence

Level I Evidence from properly conducted randomized, controlled trials

Level II Evidence from controlled trials without randomization

Or Cohort or case-control studies Or Multiple time series, dramatic uncontrolled experiments

Level III Descriptive case series, opinions of expert panels

APPENDIX B: Scale used for Recommendation Grading

Grade A Based on high-level (level I or II), well-performed studies with uniform interpretation and conclusions by the expert panel

Grade B Based on high-level, well-performed studies with varying interpretation and conclusions by the expert panel

Grade C Based on lower level evidence (level II or less) with inconsistent findings and/or varying interpretations or conclusions by the expert