

Optimum Rx of DVT – 27th Dec 2015, Vadodara




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Case

- 69 yr female, LL Femoral, iliac, DVT, Air travel
- Rx - Systemic thrombolysis
- Massive peritoneal bleed after 24 hrs
- Anticoagulation stopped, PCV/ Cryo
- Shifted to SSH, IVC Filter introduced
- Post IVC filter, LMWH OD for 10 days
- LMWH BD for 6 weeks
- Life long OAG due to filter
- **Iatrogenic**
- **Ideal Rx : LMWH 4days + OAG for 6 months**

**JEFFREY
ARCHER**

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Ideal Rx for thrombosis

- **Arrest thrombus propagation**
- **Prevent distal emboli**
- **Prevent recurrence**
- **Avoid bleeding complications**
- **Rapid action**
- **Fixing the thrombus & recanalising**

Selection of Drug for Rx of thrombosis

- **Site**
- **Duration**
- **Type (Red Vs White)**
- **Clinical setting**
- **Availability of infrastructure**
- **Safety**
- **Efficacy**

DVT MANAGEMENT

- **Diagnosis**
- **Thrombophilia Workup**
- **Treatment**
- **Prevention of recurrence**

•MAIN OBJECTIVES OF TREATMENT

- Reduction of fatality
- Prevention of recurrence
- Prevention of late sequel

Venous doppler

- Both lower limbs
- Both upper limbs
- IVC
- This approach helps to Rx patients on OPD basis & before IVC filter.

D-Dimer

- Good negative predictive value
- Positive predictive value poor
- D-Dimer > 6000 ng/ml – suggestive of malignancy
- Sensitivity varies with kits
- Haematologica , Feb. 2005

IMAGING

- **Volumetric CT angio of thorax**
- **Venous Doppler**
- **2D Echo Doppler of heart**
- **X-Ray**

Why VQ Scan not preferred?

- **Low specificity**
- **Cumbersome**
- **Needs expert to interpret**
- **Slow**
- **Other pulmonary pathologies interfere**
- **Availability**
- **Difficult to Organize in emergency hours**

Adv : CT Angio

- **Extremely specific and sensitive**
- **Very Rapid / Repeat testing**
- **More objective**
- **Available at emergency hours**
- **Easy to interpret**
- **Other pulmonary data**

**Meta analysis showed 22% PE not diagnosed by VQ
Scan are picked up by CT angio.**

**ISTH does not recommend VQ scan as a modality for
Diagnosis of PE (Consensus committee report, Windsor 2004)**

PRE-TEST PROBABILITY OF DVT

- **Active cancer** 1
- **Paralysis, paresis or recent plaster** 1
- **Recently bedridden or major surgery** 1
- **Localized tenderness along the veins** 1
- **Entire leg swollen** 1
- **Calf swelling 3 cm > asymptomatic side** 1
- **Pitting oedema** 1
- **Collateral superficial veins (non-varicose)** 1
- **Alternative diagnosis** - 2

PRE-TEST PROBABILITY OF DVT

- Calculation of Probability

- High > 3
- Moderate 1-2
- Low < 0

Wells et al 1995

Mayo clinic score

- Malignancy - 1, Neuro & Pancreas 2
- BMI > 35 - 1
- Bedridden > 3 days – 1
- Hb < 9 gm% - 1
- Platelet > 500000 / cmm – 1
- Past h/o DVT - 1
- **Score > 3 , Definite VTE prophylaxis**

Thrombophilia testing

- Why to do the testing ?
- When to send the sample ?
- What tests to be asked ?
- How to send the sample ?

Why to do testing

- Helps to decide duration of upfront anticoagulation

EXTREMELY CONTROVERSIAL

- Primary & Secondary prophylaxis
- Family testing

When to send the sample

- **At diagnosis of DVT**
 - Before starting Anticoagulation
 - All except **Protein C , S , AT III assay**
- **At 6 months, stop OAG for 30 days**
 - **Protein C , S , AT III assay**

What tests to ask

- Functional tests are better than antigenic tests
- DRVVT is more specific than ACA
- Pregnancy associated DVT, to check FVIII c Assay & vW studies

How to send the sample

- Ideally to be collected at the laboratory
- We need 3 citrated , 3 EDTA & 2 plain tubes per patient
- To be transported to the lab as fast as possible

Data at Sahyadri Lab (Jan. 2000 - Mar. 2010)

- Total - 829
- All tests normal - 45 %
- Factor V Leiden - 16%
- LA positive - 16 %
- APC resistance - 06 %
- Protein C , S - 03 %
- AT III - 02 %
- Hyper homocy - 04 %
- Others - 03 %

Anticoagulation Therapy

- What is ideal upfront therapy
- When to start Warfarin
- How long to continue Warfarin
- Position of NOAC

Thrombus Pathophysiology

- **Red thrombus - Venous**
- **White Thrombus - Arterial**
- **Antiplatelet Drugs have limited role in Venous Thrombosis**

Crucial initial anticoagulation

- **Initial treatment is crucial in order to reduce the risk of late thromboembolic recurrences**
- **The use of heparin protocols assures to achieve the therapeutic range for the APTT, decreasing the likelihood of recurrent venous thromboembolism**

Upfront Therapy

- **UFH** - 5000 units IV bolus , 450 u/kg/d
Continuous infusion
- **LMWH** – 100 u / kg Dalteparin s/c BD
1 mg / kg Enoxiparin s/c BD
- **Thrombolysis** - Local
Systemic

LMWH

- **Revolutionary**
 - **Greater Bio-availability with sc injection**
 - **No PTT monitoring**
 - **More predictable response**
 - **Long Half life**
 - **Less complications as compared to UFH**
 - **Can be given as outdoor patient**

Thrombolysis

- All major trials comparing LMWH v/s Thrombolysis (Local)
- No big trial has used systemic Thrombolysis
- Do you really need thrombolysis for a clot which is red & is more than 24 hour old ?

Indications for thrombolytic therapy

Thrombolytic therapy is indicated in patients with massive PE, as shown by RV Failure and/or hypotension.

The use of thrombolytic therapy in patients with submassive PE (RV hypokinesia) is controversial.

Thrombolytic therapy is not indicated in patients without right ventricular overload.

•Task Force Report, Eur Heart J 2000;21:1301

Troponins – a risk factor for poor outcome in acute pulmonary embolism

- **Correlation between elevation of troponins and clinical course**
- **Elevation of TnT predicts recurrent pulmonary embolism**
- **TnT ≥ 0.1 ng/mL related to more frequent prolonged hypotension, cardiogenic shock, cardiopulmonary resuscitation and death**
- **Total mortality 44% in patients with TnT ≥ 0.1 ng/mL and 3% in those with TnT < 0.1 ng/mL**
- **Measurement of TnT may help identifying high risk patients that are candidates for thrombolysis**

Vena caval filters: ACCP recommendations

Hyers et al, Chest 2001:176S-193S

- When there is a contraindication or complication of anticoagulant therapy (**grade 1C +**)
- For recurrent thrombo-embolism that occurs:
 - despite adequate anticoagulation,
 - for chronic recurrent embolism with pulmonary hypertension,
 - with the concurrent performance of surgical pulmonary embolectomy or pulmonary thromboendarterectomy (**grade 1C**)

IVC FILTER

- Is life long anticoagulation required ? **YES**
- Recurrent PE without Documented Leg VT – Is IVC filter justified ?

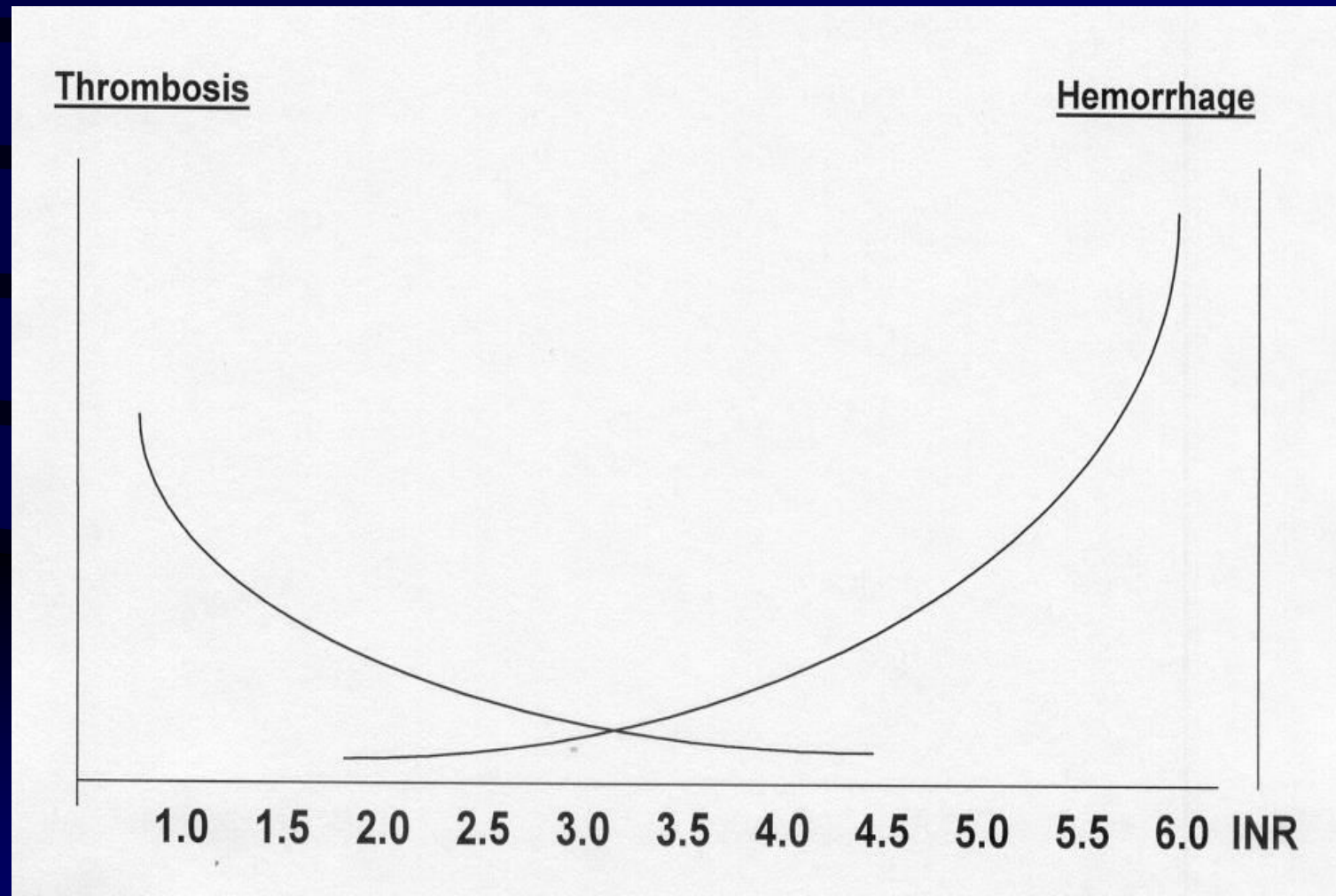
A) No PH - Filter ?

B) PH - Filter

Ideal OAG Mx

- **No thrombosis**
- **No bleeding**
- **Convenience to the patient**
- **Easy monitoring**
- **Few drug interactions**
- **Easy reversibility**

OAG: tight therapeutic window



Oral anticoagulation: an essential therapy

Its efficacy and safety increase with:

- **Appropriate indications**
- **Skilful laboratory control**
- **Appropriate doses**
- **Appropriate Duration**
- **Skilful clinical monitoring and assistance**
- **Education and compliance of patients**
- **Adequate services are crucial**

Indications for long term OAG

- **Recurrent DVT / PE**
- **PE with PH**
- **Prosthetic valve**
- **CVA with atrial fibrillation**
- **CVA with LV clot**
- **Post MI systemic emboli**
- **DVT post THR**
- **Malignancy**

Principles of monitoring therapeutic INR

- **INR 2 - 3**
- **No adjustments needed at INR 1.8 – 3.5**
- **Spontaneous bleeding rarely occurs at INR < 5**
- **If INR < 5 no panic button should be triggered**
- **Do not make a major change on isolated report**
- **Evaluate other causes of INR fluctuation**

Patient education

- **Effect of anticoagulant drugs**
- **Measure of anticoagulation level (INR)**
- **Regular drug assumption and monitoring**
- **Diet and drug interactions**
- **Instruction about bleeding, pregnancy, etc**

The quality control of OAG

The quality of

- **PT test**
- **Maintained anticoagulation levels
(time in range)**
- **Therapeutic results
(thrombotic / bleeding events)**

Quality of therapeutic levels (laboratory control)

- Percentage of INRs within the therapeutic range (**80%**)
- Time spent below-within-above the therapeutic range by a linear interpolation method
- **Rosendaal et al., Thromb Haemost 1993;69:236**

DVT Prophylaxis

- **Past h/o DVT**
- **Obesity**
- **Malignancy surgeries**
- **Orthopaedic Surgeries**
- **Prolonged bed ridden state**
- **High risk**

Case

- **60 yr male, Lap chole for GB**
- **12 hrs post –op sudden disposal. Shifted to SSH**
- **On adm – ICU , on ventilator , 3 inotrop**
- **Volumetric HRCT Thorax & CT Pulm Angio**



Case

**Shifted to cath Lab- Local Thlysis with-
r-TPA, clexane sc**

- **Within 24 hrs complete lysis of PE, pt. off ventilator inotropes in 48 hrs.**
- **Discharged on day 7**
- **Life long OAG**

Pregnancy & Anticoagulation

- **DVT is not the indication for MTP**
- **LMWH is the best and safest**
- **S/c UFH may be used**
- **Post partum OAG & once a week 0.1 mg Vit K s/c to the child**
- **Avoid pregnancy while on OAG**

OAG and Surgery

- **Emergency Surgery**
- **Stop Warfarin**
- **IV Vit K 5 mg**
- **Check H'gm , PT , APTT**
- **If high risk of thrombosis / PE start continuous infusion IV Heparin at 50 % dose**
- **If risk of bleeding is less LMWH prophylaxis**
- **Once wound healing over switch to OAG**
- **If risk of thrombosis & bleeding is high it is safer to use IV ci Heparin**

VTE - Duration of therapy

ACCP Guidelines 2001

3-6 months

- 1st event with time-limited risk factor

≥6 months

- 1st idiopathic

12 months-lifetime

- 1st event with*
 - Cancer until resolved
 - ACA
 - AT deficiency
- Recurrent event

•All recommendations to be individualised

•* Unclear for homozygous fVL,
homocysteinemia, protein S or C deficiency

General principles in tackling bleeding complications

- **Always rule out structural / local cause**
- **Half life of the drug**
- **Metabolism of the drug**
- **Bleeding occurring in therapeutic range**
- **Drug interactions**
- **Systemic disorders contributing to bleed**
- **Availability of antidote**
- **Always rule out congenital bleeding disorders**
- **Blood component support**

Major causes of bleeding

- **Wrong selection of the drug**
- **Wrong dosage**
- **Unnecessary combinations**
(**WAARIS TRIAL**)
- **Missed underlying medical or surgical causes**
- **Wrong reports of coagulation tests**
- **Unnecessary interventions**

DVT and Malignancy

NOAC

- To be used with caution
- No antidote
- Monitoring of **Anti Xa**

BBC SPORT ONLINE: BBC SPORT ONLINE: [CRICKET](#)

Wednesday, 3 October, 2001, 09:39 GMT 10:39 UK

Steve Waugh suffering dangerous blood clot



Australian cricket captain Steve Waugh has confirmed he is suffering from deep vein thrombosis (DVT), the potentially fatal condition better known as "economy class syndrome".