

Venous Thromboembolism in Arthroplasty Patients

Introduction

Includes deep vein thrombosis (DVT) and pulmonary embolism (PE), is a significant and potentially life-threatening complication in patients undergoing arthroplasty surgeries.

Risk Factors

Patient	Surgery
Previous history of VTE	Revision surgery
Hx of malignancy	Bilateral
Prolonged immobilization	Prolonged surgery time
Age, BMI, ethnicity	Delayed surgery after hip fracture
Smoking	Delayed ambulation
Use of oral contraceptive	General anaesthesia
Varicose veins	

*** TXA does not increase risk of VTE

Sabbag OD, Abdel MP, Amundson AW, Larson DR, Pagnano MW. Tranexamic Acid Was Safe in Arthroplasty Patients With a History of Venous Thromboembolism: A Matched Outcome Study. J Arthroplasty. 2017 Sep;32(9S):S246-S250. doi: 10.1016/j.arth.2017.02.008. Epub 2017 Feb 14. PMID: 28262452.

Prevention

Non-pharmacological (mechanical)

- Early mobilization
- Graduated Compression Stockings (GCS)
- Intermittent Pneumatic Compression (IPC), Venous Foot Pumps (VFP)
 - o Mechanical and biochemical effects (preferred to GCS)
Comerota AJ, Chouhan V, Harada RN, Sun L, Hosking J, Veermansunemi R, Comerota AJ Jr, Schlappy D, Rao AK. The fibrinolytic effects of intermittent pneumatic compression: mechanism of enhanced fibrinolysis. Ann Surg. 1997 Sep;226(3):306-13; discussion 313-4. doi: 10.1097/0000658-199709000-00010. PMID: 9339937; PMCID: PMC1191029.
- Inferior Vena Cava (IVC) Filter (pre-emptive investigation + high risk patients)

Timing: immediate post-op for elective arthroplasties, pre-op for fracture patients

Pharmacological Prophylaxis

Enoxaparin 40 mg (LMWH) – Gold standard, parenteral admin (reversal – protamine)

DOACs (apixaban, rivaroxaban, dabigatran)

Unfractionated heparin (UFH)

Aspirin – most cost-effective with lowest complication rates

Vitamin K antagonists (warfarin) - historical

Considerations

		VTE risk	
		Standard	Elevated
Bleeding risk	No	Mech ± pharm	Mech + pharm
	Yes	Mech alone	Mech ± aspirin

Duration:

Single TKA 2/52, bilateral TKA 4/52, THA 6/52

Warwick D, Friedman RJ, Agnelli G, Gil-Garay E, Johnson K, FitzGerald G, Turibio FM. Insufficient duration of venous thromboembolism prophylaxis after total hip or knee replacement when compared with the time course of thromboembolic events: findings from the Global Orthopaedic Registry. J Bone Joint Surg Br. 2007 Jun;89(6):799-807. doi: 10.1302/0301-620X.89B6.18844. PMID: 17613508.

Diagnosis

S & S of PE: tachycardia, sudden dyspnoea, pleuritic chest pain, hypoxia

Investigation:

D-dimer – serum biomarker of fibrin formation

USG doppler – visualize flow and compressibility of limb venous system

CTPA – diagnose PE

*** V/Q scan – historical investigation, largely superseded by CTPA, venogram – invasive, mostly used for research

Further readings:

ICMphilly <https://icmphilly.com/vte-icm-pre-print-questions-answers/>

Asia-Pacific venous thromboembolism consensus in knee and hip arthroplasty and hip fracture surgery

Part 1: <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC8214263/>

Part 2: <https://pubmed.ncbi.nlm.nih.gov/34193307/>

Part 3: <https://pubmed.ncbi.nlm.nih.gov/34384504/>