

## 6.1. Data extraction

**Table 29 Treatment of catheter-related thrombosis: LMWH + VKA and catheter removal**

References Study design Inclusion period	Number of patients included/evaluated Follow-up	Features of included patients	Intervention	Endpoint	Results
[SAVAGE1999] Prospective non-randomized Mar 1996 - Feb 1998	46/46 M/F: 24/22 Symptomatic CVC-VTE 12 weeks Lost to follow up: 1/46 (2.2%)	Cancer: 34 (74%) CVC: 16 (35%) CRT diagnosis Duplex: 44 (96%) MRI: 1(2%) Venography: 1 (2%) DVT: 45/46 PE: 1/46	Dalteparin: 200 IU/kg SC /day for 5-7 days then warfarin 10 mg on Day 1 (INR 2 to 3) Dalteparin alone for 10-90 days (6/46 patients (13%))	Symptomatic recurrence confirmed by Doppler US or phlebography	Recurrent DVT: 1/46 (2.2%); 95%CI [-2.0-6.4] PE: 0
				Major bleeding	1/46 (2.2%); 95%CI: [-2.0-6,4]
				Catheter removal	0
[KOVACS2007] Prospective non-randomized Nov 2002 - Dec 2005	74/64 M/F: 48/26 Symptomatic CVC-VTE 3 months Lost to follow up Death: 7 Patient preference: 2 Major bleeding: 1	Patients with solid tumor PICC: 57 (77%) Portacath: 14 (19%) Hickman CVC: 3 (4%)  Mini-dose warfarin prophylaxis (1 mg/day): 22 (30%)  CRT diagnosis Duplex: 71 (96%) CT venography: 3 (4%)	Dalteparin : 200 IU/kg SC /day for ≥5 days then Warfarin, Day 1 (INR 2 to 3)	Primary Catheter removal due to CRT	CVC removed: 32/74 (43%). Reasons: - End of treatment: 21/74 (28%) - Infection: 2/74 (2.7%) - Other: 9/74 (12.2%) - Recurrence or dysfunction: 0  Rate of success in patients with retained CVC: 42/42
				Secondary CRT recurrence Major bleeding Death	0 3 (4.7%); 95%CI [0.8-11.4] 7 (1 death related to major bleeding)
[FRANK2000] Retrospective study Jan 1992 - Dec 1995	112/103 patients 6 months	Cancer CRT diagnosis by radionuclide phlebography	Primary catheter removal in 58 (52%): Anticoagulation: 22/58 (38%) No anticoagulation: 36/58 (62%) (Anticoagulation = heparin and/or VKA)  Anticoagulation in 59 (53%): without CVC removal: 37 (63%) with CVC removal: 22 (38%)  Urokinase: 2 (2%) Other therapy (antibiotics): 7 (6%) No therapy: 8 (7%)	PE Death Persistent extremity edema	0 5 (due to cancer) 4 (CVC removed in all cases)
[TRAN2010] Retrospective study Apr 2001 - Feb 2006	899 PICC placed in 498 hematologic malignancy patients 39 patients with CRT Median age: 45.5 years; M/F:25/14 No CVC thromboprophylaxis Median follow-up: 601 days	Hematologic malignancy patients CRT diagnosis by Doppler US Time to onset of CRT Median 26 (2-172) days after placement	CVC removal: 28 (72%) Thrombectomy/thrombolysis: 5 (13%) Anticoagulation for 3 months: Heparin: 30 (77%); Warfarin: 9 (23%)	PE Recurrent DVT Bleeding Death	0 0 0 16 (41%)

**Table 30 Treatment of established catheter-related thrombosis: thrombolytics**

References Study design Inclusion period	Number of patients included/evaluated Follow-up	Features of included patients	Intervention	Endpoint	Results
<b>[SCHINDLER1999]</b> Retrospective study Mar 1993 - Jun 1997	51 CRT 18 treated/18 M/F: 2/16 Solid tumor n=14 Hematology malignancy: n=4 Median time to diagnosis from CVC insertion: 46 days (3-180)	Cancer High-dose chemotherapy Diagnosis Doppler US or venography  Hickman CVC: 14/18 (78%) PICC: 4/18 (22%)	Urokinase: IV CP 75 000 - 150 000 UI/h for 24 to 96 hours (median: 48 hours) in a peripheral vein of the upper limb where the CRT was located followed by UFH and warfarin (INR 2 to 3)	Recanalization on phlebography Major bleeding	Clinical response: 18/18 (100%) Complete clinical response: 8/18 (44%) Partial clinical response: 10/18 (56%) Complete radiologic response: 0/18 (0%) Partial radiologic response: 9/18 (50%) Radiologic failure: 9/18 (50%)  Recurrent CVC thrombosis: 4/18 (22%) CVC salvaged: 12/18 (67%)  Bleeding complications: 4/18 (22%) Minor bleeding: 3/18 (17%) Major bleeding: 1/18 (5.6%)
<b>[PUCHEU1996]</b> Retrospective study Jan 1989 - Oct 1994	412 patients with systematic Doppler US  57 CR: 15 partial CRT + 42 complete CRT  32 patients treated by systemic fibrinolysis	Cancer + chemotherapy Totally implantable venous access devices Vena cava syndrome not specified	Arm A (n=32): Streptokinase: 16/32 (50%) Urokinase: 5 rt-PA: 4/32 (12.5%) Streptokinase + urokinase : 7/32 (21.8%) Fibrinolysis followed by enoxaparin for 3 weeks then VKA	Repermeabilization on Doppler US	Arm A: 16/32 (50%) with no difference between the fibrinolytic drugs Arm B: 1/25 (5%) p=0.009
			Arm B (n=25): Enoxaparin for 3 weeks then VKA	PE Death Major bleeding	2/25 without PE confirmation 0/25 death 0/25 major bleeding