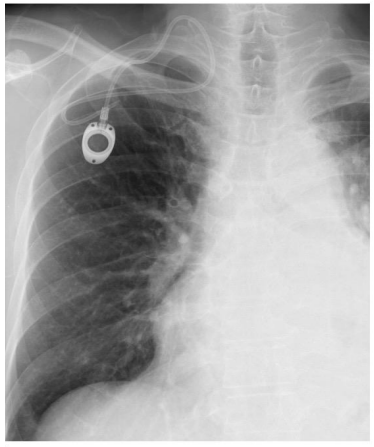
Come diagnosticare e trattare le malposizioni secondarie

Bologna 3 dicembre 2025



Sonia D'Arrigo
Istituto di Anestesia e Rianimazione
Fondazione Policlinico Universitario Agostino Gemelli-IRCCS

Malposizioni secondarie- Complicanze tardive

Infezioni

Trombosi

Malposizioni secondarie

Migrazione del tratto intravascolare del catetere, con punta che si posiziona in sede impropria, dopo un certo lasso di tempo dall'impianto.

Infusion Therapy Standards of Practice

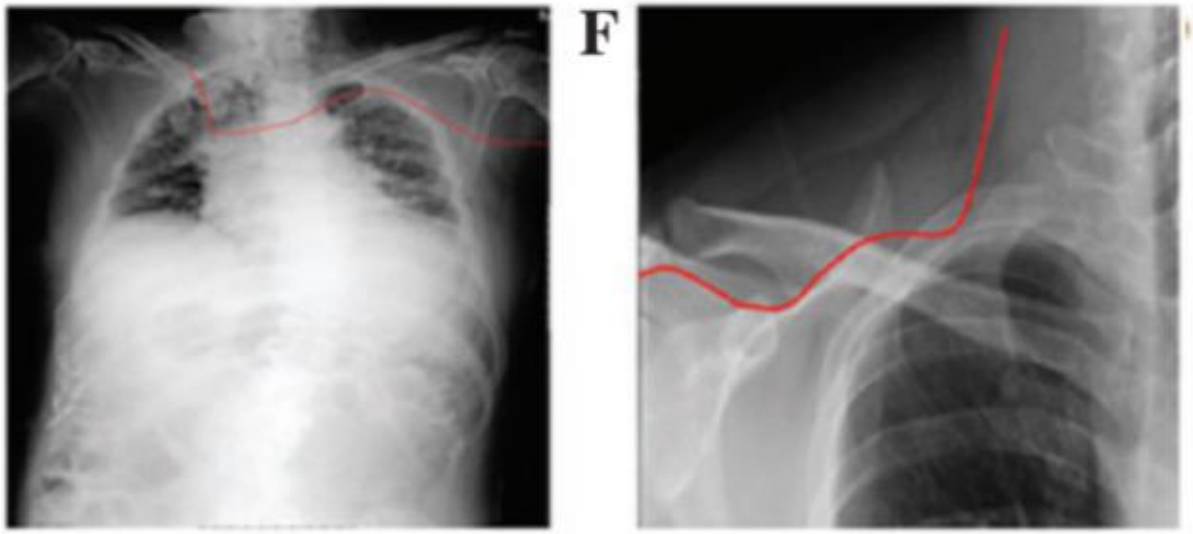
Fattori di rischio

stenosis, and malignant or benign lesions compressing the vein.[1-7] (IV)

2. Secondary intravascular malposition of CVADs, also known as tip migration, occurs any time during the dwell and is related to sporadic changes in intrathoracic pressure (eg, coughing, vomiting); original tip located high in the SVC; DVT; congestive heart failure; neck or arm movement; and positive pressure ventilation.[4,8-10] (IV)
3. Primary and secondary extravascular CVAD malposition includes location in the:
   a. Mediastinum producing infiltration/extravasation.
   b. Thoracic duct producing chylothorax.

Possibili sedi di malposizione secondaria

- **Vena giugulare interna**
- **Vena anonima**
- **Vena ascellare/succlavia**
- **Atrio destro o ventricolo destro** (rischio di aritmie se troppo in profondità)
- **Vena azygos**
- **Vene periferiche**



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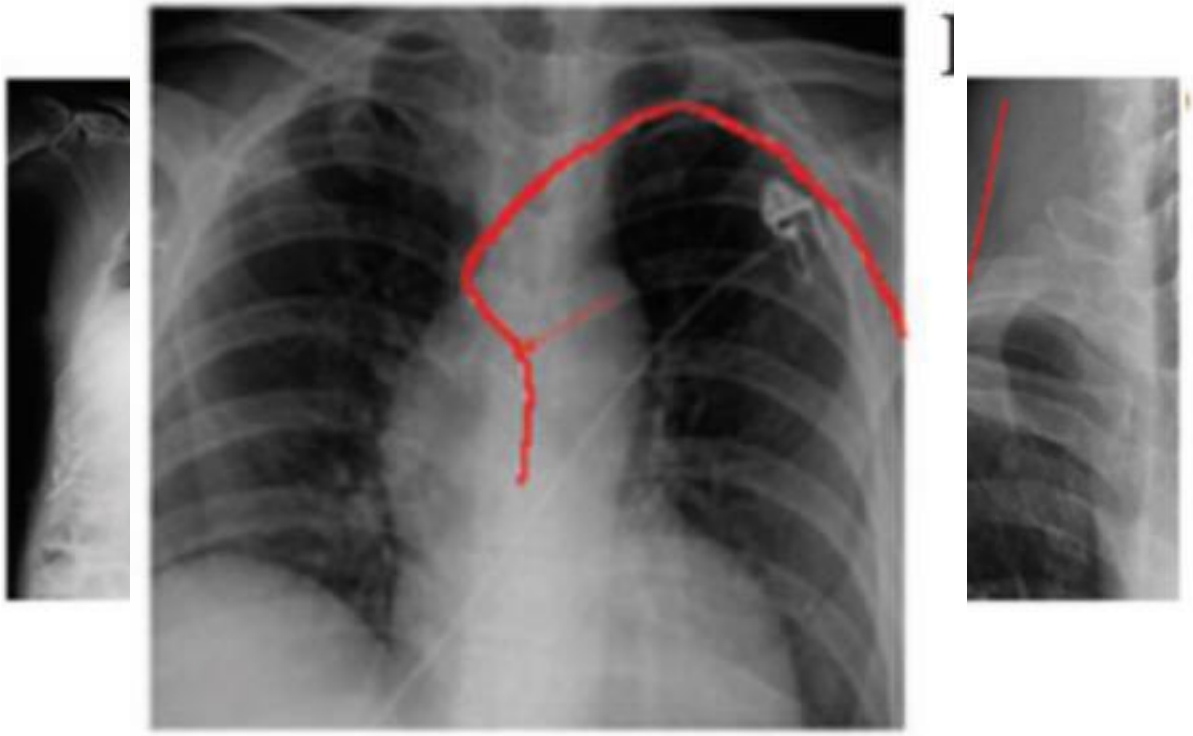

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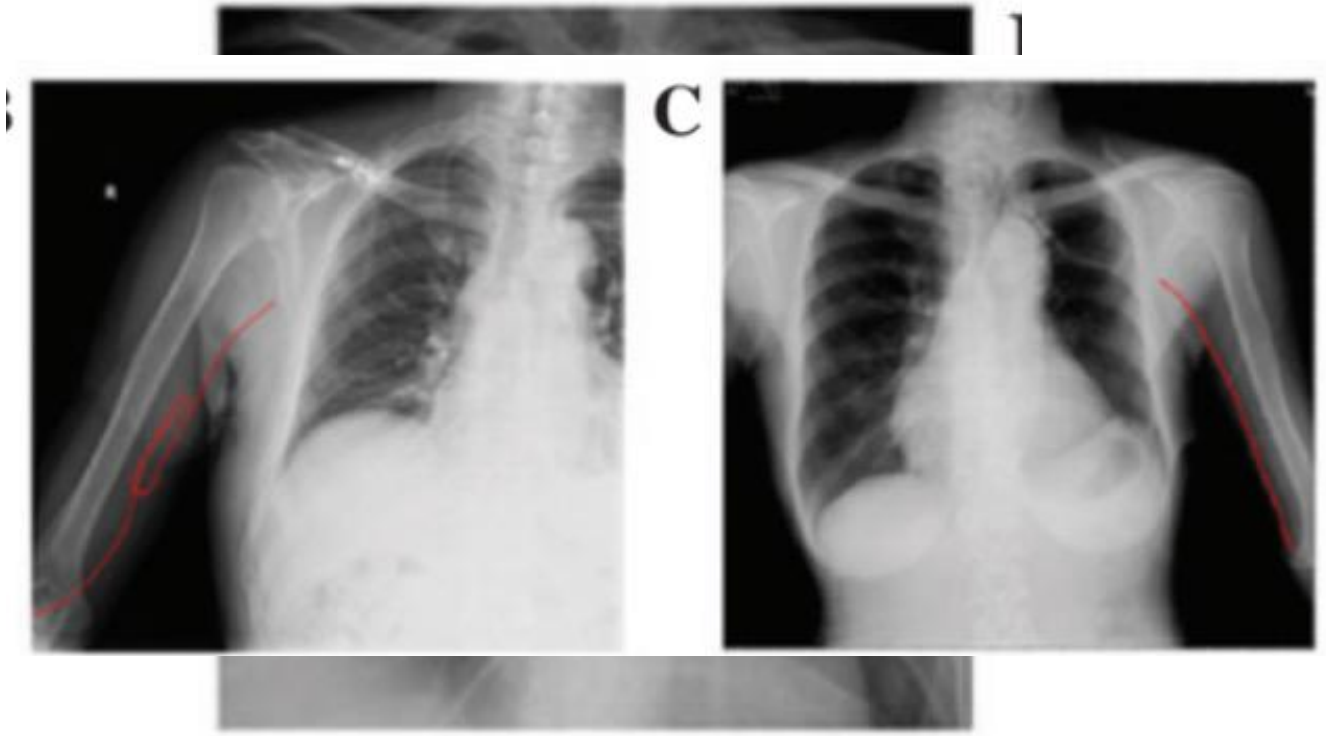


Infusion Therapy Standards of Practice

Segni, sintomi e gestione

3. Management may require an exchange over a guidewire or removal and insertion at a new site.[21,23] (V)

I. Assess the patient and the CVAD for signs and symptoms of catheter dysfunction and associated complications before each CVAD infusion as these factors will be the first indication of malposition:
   1. Absence of blood return from all catheter lumens.
   2. Changes in blood color and pulsatility of the blood return from all catheter lumens.
   3. Difficulty or inability to flush the CVAD.
   4. Arterial vs venous waveform from an attached pressure transducer.
   5. Atrial and ventricular dysrhythmias.
   6. Changes in blood pressure and/or heart rate.
   7. Shoulder, chest, or back pain during insertion or dwell time.
   8. Edema in the neck or shoulder.
   9. Changes in respiration.
   10. Complaints of hearing gurgling or flow stream sounds on the ipsilateral side.
   11. Paresthesia and neurological effects due to retrograde infusion into the intracranial venous sinuses.[4,23-27] (IV)

J. Withhold infusion through a malpositioned catheter until proper tip position has been established. Assess the prescribed infusion therapy and, if possible, insert a short PIVC to continue therapy. If the infusion therapy is not possible through a peripheral vein, assess the potential risk for discontinuing therapy and consult with the provider regarding changing the infusion therapy until the proper CVAD tip location can be reestablished.[27] (V)

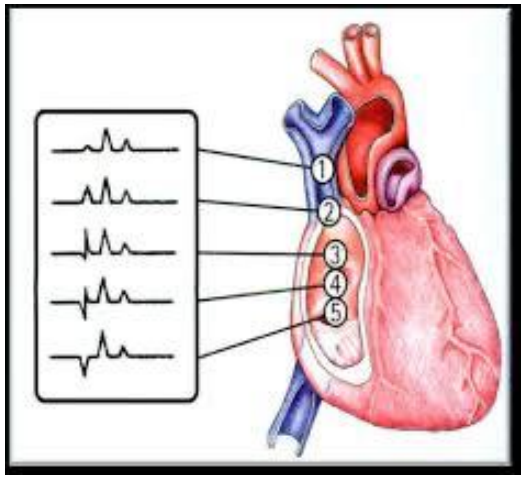
K. Obtain diagnostic tests including chest radiograph with or without contrast injection, fluoroscopy, echocardiogram, CT scan, and/or magnetic resonance imaging (MRI) to diagnose CVAD malposition based on clinical signs and symptoms and problems with catheter function.
   1. Provide the radiology department with clinical informa-

Segni clinici possibili

- Resistenza all’infusione di liquidi
- Reflusso assente o ridotto
- Dolore o fastidio lungo il decorso venoso
- Gonfiore o arrossamento nel sito di inserzione
- Comparsa di aritmie o battiti ectopici (se punta in atrio)
- Allarmi su pompe infusionali

Diagnosi

- **ECG intracavitario** (per confermare la posizione della punta)
- **Ecografia** (per valutare il decorso venoso e sede del catetere)
- **Rx torace** (standard per valutare la migrazione)
- TC nei casi complessi



JVA
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J Vasc Access 2015; 16 (3): 178-182
DOI: 10.5301/jva.5000337

REVIEW

Contributing factors for a late spontaneous peripherally inserted central catheter migration: a case report and review of literature

2015

Paolo Beccaria[1], Simona Silvetti[1], Milena Mucci[1], Ivana Battini[2], Paola Brambilla[2], Alberto Zangrillo[1]

[1] Department of Anaesthesia and Intensive Care, San Raffaele Scientific Institute, Milan - Italy
[2] PiCC-Team Nurse, San Raffaele Scientific Institute, Milan - Italy

TABLE I - Article information

Author	Year	Journal	Manuscript type	N	Site of misplacement
Qiu XX (5)	2013	Int J Nurs Stud	Prospective study	21	12 IJV, 5 BCV, 3 SV, 1 AV
Cronen P (6)	2012	Am Surg	Case report	2	1 IJV, 1 AV
Lambeth L (7)	2012	J Vasc Interv Radiol	Case report	4	3 IJV, 1 BCV; than 1 azygus vein
Lozano LA (8)	2012	J Comput Assist Tomogr	Prospective study	12	7 ANV, 2 IJV, 1 SV, 2 SVC cephalad
Zhang Y (9)	2011	J Anesth	Case report	1	1 SV

IJV = Internal jugular vein; BCV = Brachiocephalic vein; SV = Subclavian vein; AV = Axillary vein; ANV = Anonym vein; SVC = Superior vein cava.

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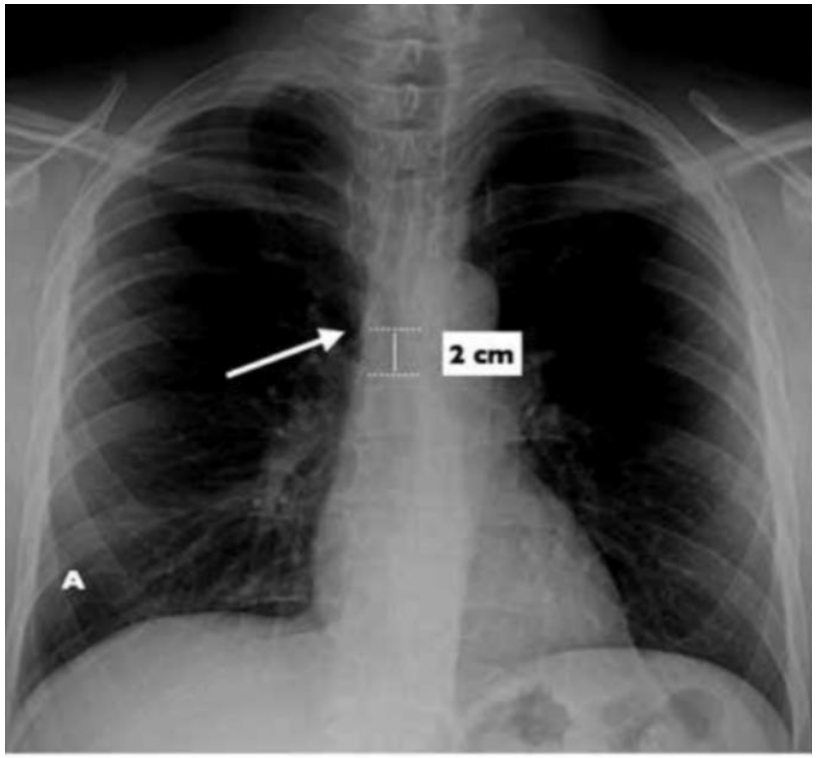

- PICC inserito da sin per CHT
- Punta alta in SVC
- Dopo 5 mesi il catetere dava problemi di withdrawal

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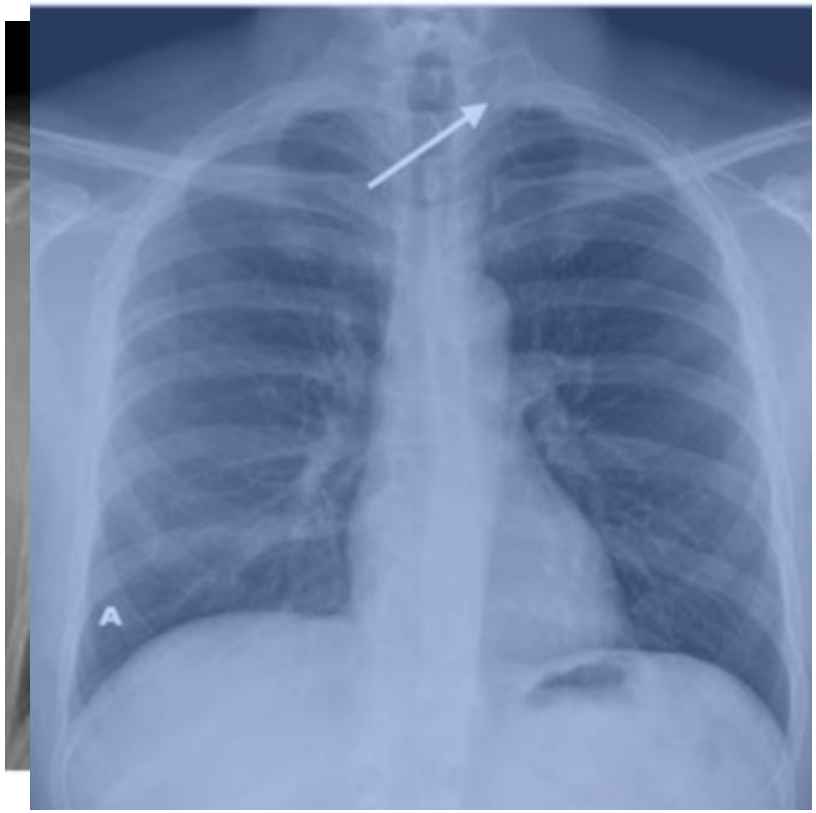

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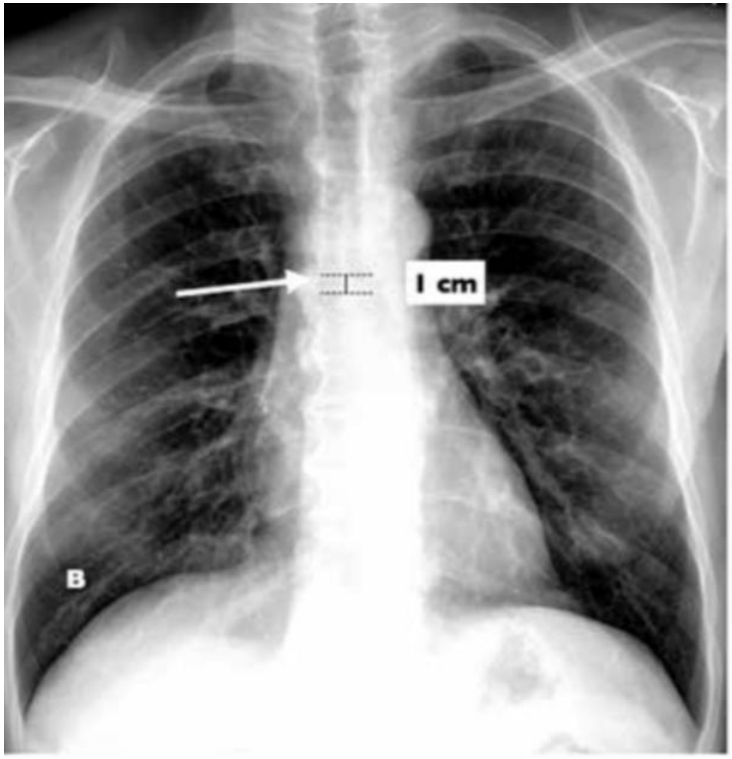

- PICC inserito da destra per CHT
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- Dopo 2 mesi problemi di withdrawal

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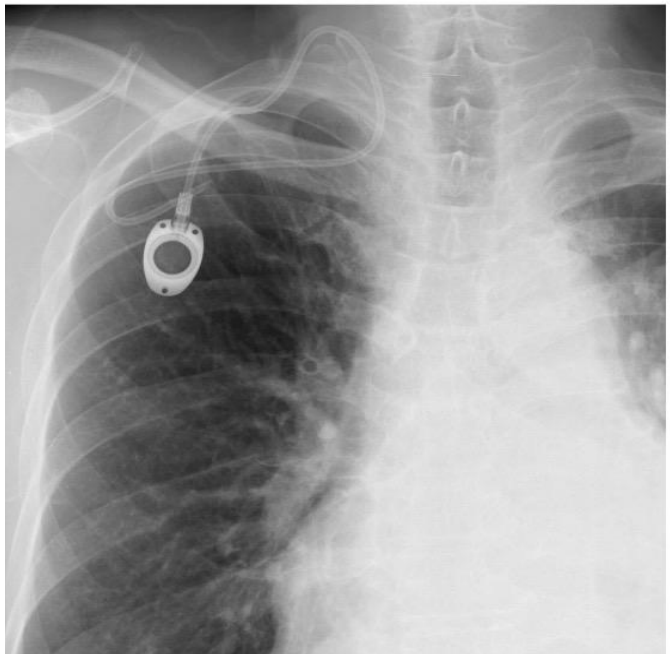
- Dopo 2 mesi problemi di withdrawal

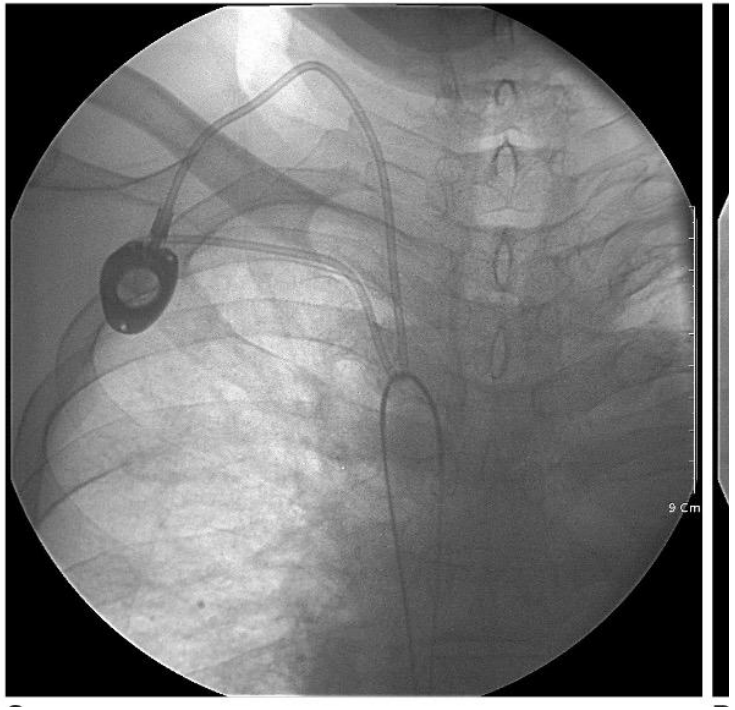
Spontaneously Migrated Tip of an Implantable Port Catheter into the Axillary Vein in a Patient with Severe Cough and the Subsequent Intervention to Reposition It

Kyung-Sik Ahn, MD
Kweon Yoo, MD
In Ho Cha, MD
Tae-Seok Seo, MD

Migration of an implantable port catheter tip is one of the well-known complications of this procedure, but the etiology of this problem is not clear. We describe here a case of migration of the tip of a port catheter from the right atrium to the right axillary vein in a patient with severe cough. Coughing was suggested for this case as the cause of the catheter tip migration. We corrected the position of the catheter tip via transfemoral snaring.

2008 Case report





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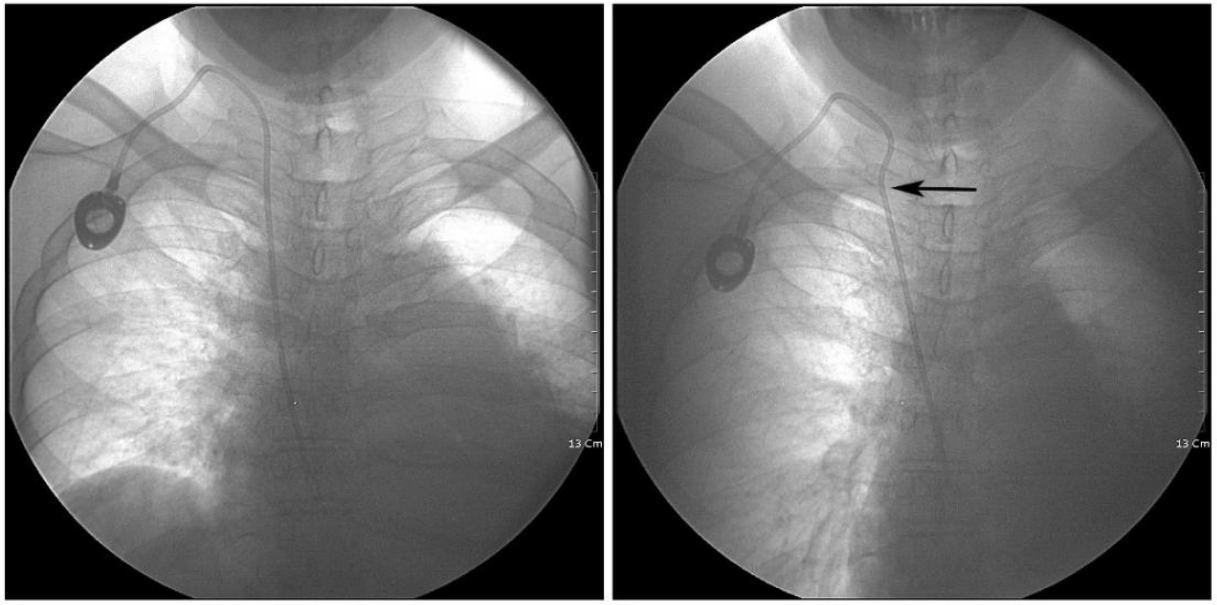


E F

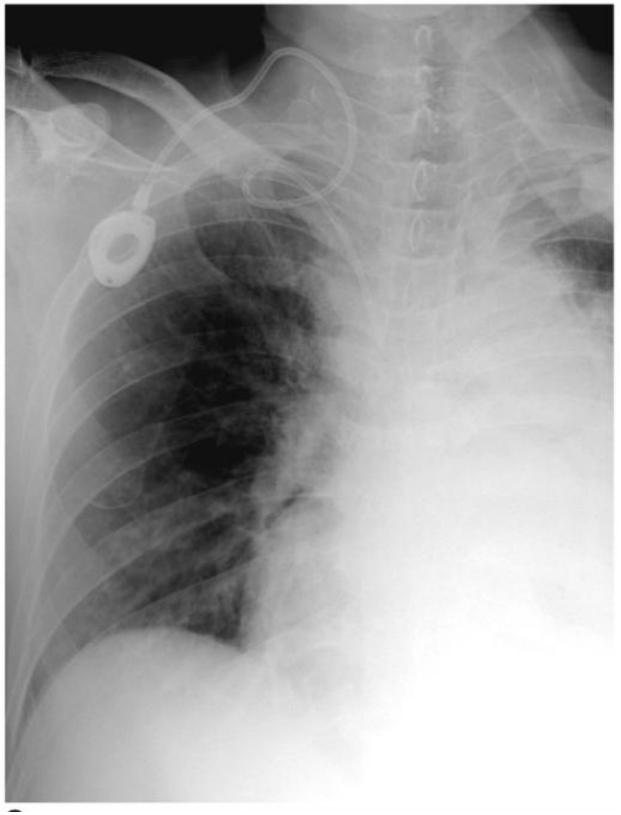


Fig. 1. Migration of implantable port catheter in 64-year-old man.
E, F. After repositioning (**E**), catheter shows normal position and curve. However, when we induced patient to cough (**F**), bending of catheter toward subclavian vein (arrow) was found on fluoroscopy.
G. Two days later, recurrent catheter migration was found on chest radiograph. Coiling is noted in middle of catheter, but catheter tip is still located in superior vena cava.

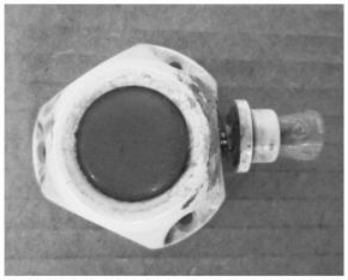
G Chir Vol. 37 - n. 5 - pp. 211-215
September-October 2016

2016

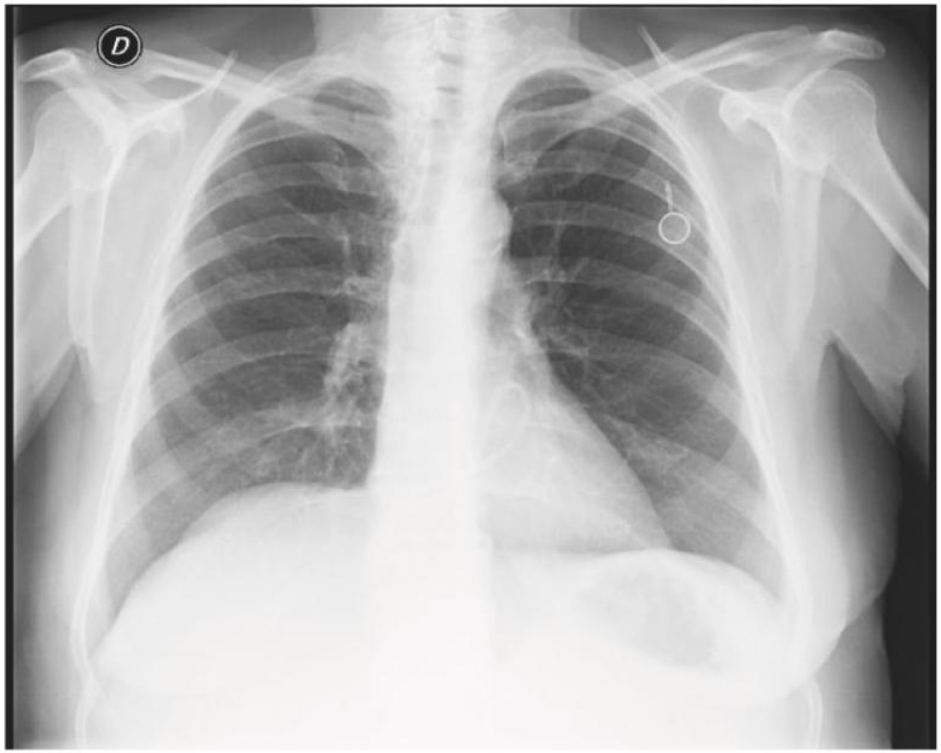
clinical practice

Totally implantable catheter migration and its percutaneous retrieval: case report and review of the literature

E. INTAGLIATA, F. BASILE, R. VECCHIO



Figures 1 and 2 - Catheter ruptured at the anastomosis with the reservoir.



Figures 3 and 4 - Catheter dislocation diagnosed by means of a chest X-ray.

RESEARCH Open Access

Risk factors for venous port migration in a single institute in Taiwan

Wen-Chieh Fan[1†], Cheng-Han Wu[2†], Ming-Ju Tsai[3], Ying-Ming Tsai[2], Hsu-Liang Chang[2], Jen-Yu Hung[3,4], Pei-Huan Chen[1] and Chih-Jen Yang[2,4*]

Abstract

Background: An implantable port device provides an easily accessible central route for long-term chemotherapy. Venous catheter migration is one of the rare complications of venous port implantation. It can lead to side effects such as pain in the neck, shoulder, or ear, venous thrombosis, and even life-threatening neurologic problems. To date, there are few published studies that discuss such complications.

Methods: This retrospective study of venous port implantation in a single center, a Taiwan hospital, was conducted from January 2011 to March 2013. Venous port migration was recorded along with demographic and characteristics of the patients.

Results: Of 298 patients with an implantable import device, venous port migration had occurred in seven, an incidence rate of 2.3%. All seven were male and had received the Bard port Fr 6.6 which had smaller size than TYCO port Fr 7.5 and is made of silicon. Significantly, migration occurred in male patients ($P = 0.0006$) and in those with lung cancer ($P = 0.004$). Multivariable logistic regression analysis revealed that lung cancer was a significant risk factor for port migration (odds ratio: 11.59; $P = 0.0059$). The migration rate of the Bard port Fr 6.6 was 6.7%. The median time between initial venous port implantation and port migration was 35.4 days (range, 7 to 135 days) and 71.4% (5/7) of patients had port migration within 30 days after initial port implantation.

Conclusions: Male sex and lung cancer are risk factors for venous port migration. The type of venous port is also an important risk factor.

Keywords: Venous port, Migration

2014

INCIDENZA 2.3% (7/298)

- Tutti maschi
- Tutti con tumore polmonare
- Catetere di diametro più piccolo
- In silicone

European Journal of Vascular and Endovascular Surgery 44 (2012) 82–87

Contents lists available at SciVerse ScienceDirect

European Journal of Vascular and Endovascular Surgery

journal homepage: www.ejves.com

Risk Factors and Possible Mechanisms of Intravenous Port Catheter Migration

C.-Y. Wu [a], J.-Y. Fu [b,c], P.-H. Feng [b], Y.-H. Liu [a], C.-F. Wu [a], T.-C. Kao [a], S.-Y. Yu [a], P.-J. Ko [a,*], H.-C. Hsieh [a]

[a] Division of Thoracic and Cardiovascular Surgery, Department of Surgery, Chang Gung Memorial Hospital, Chang Gung University, 5 Fu-Shing Street, Kweishan, Taoyuan 333, Taiwan
[b] Division of Pulmonology/Chest, Department of Internal Medicine, Chang Gung Memorial Hospital, Chang Gung University, Taiwan
[c] Division of Pneumonology and Critical Care, Department of Internal Medicine, Saint Paul Hospital, 123 Jian-Xin Street, Taoyuan, Taiwan

WHAT THIS PAPER ADDS

- In a multivariate logistic regression analysis, shallow tip location (relative to the carina) and the presence of lung cancer were statistically significantly associated with catheter-tip migration.
- Results recommend that shallow tip location should be avoid during implantation and that closer surveillance should be undertaken among patients with lung cancer.

Catetere ‘corto’ e tumore del polmone sono significativamente associati a tip migration.

2012

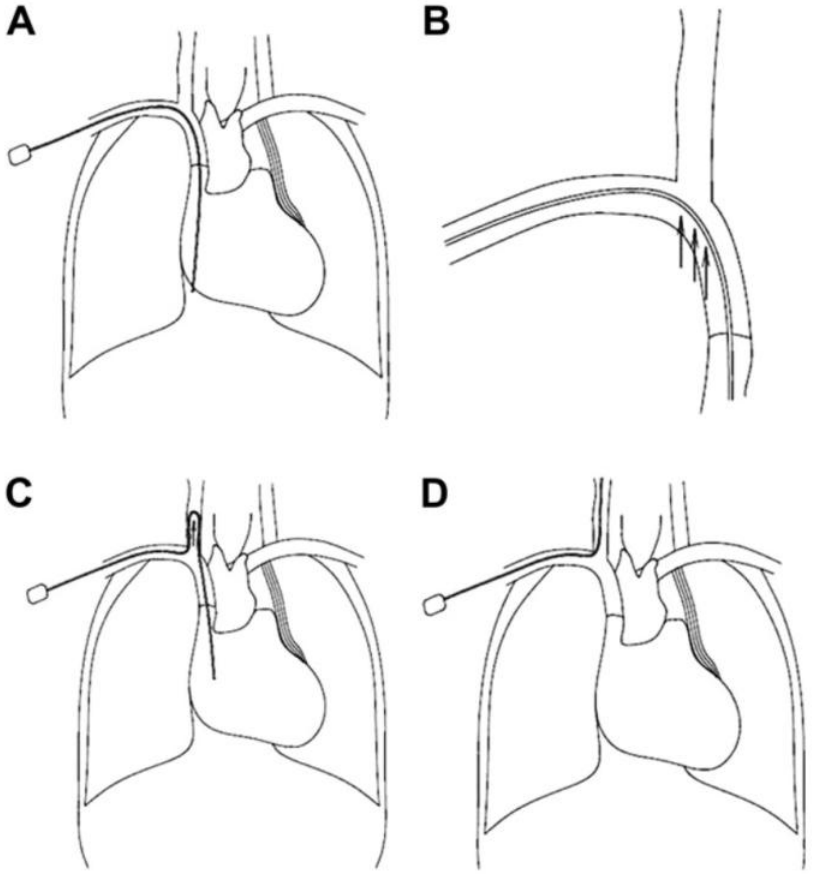


Figure 3. Schematics of the effects of increased intra-thoracic pressure on the catheter. (A) Catheter status prior to intra-thoracic pressure increase (B) Black arrows show how the increased intra-thoracic pressure worked on intravenous catheter (C) Catheter migrated and formed a loop in internal jugular vein because of increased intra-thoracic pressure (D) Catheter migrated to internal jugular vein under persistent increased intra-thoracic pressure.

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Case Report

Spontaneous migration of a peripherally inserted central catheter into the azygos vein and accidental transection during thoracic surgery: A case report

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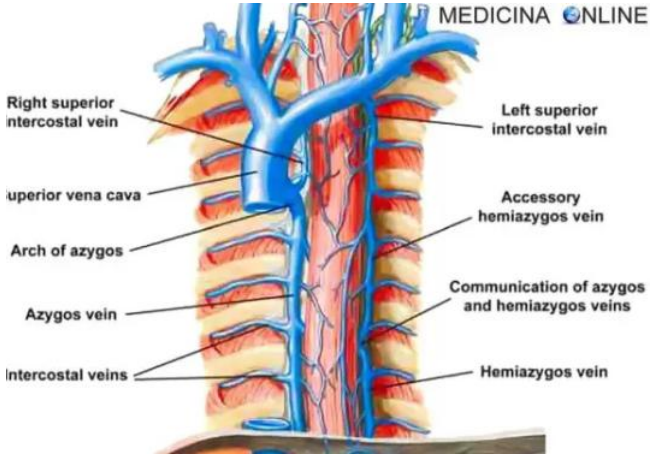
[a] Jiangsu Cancer Hospital, Nanjing Medical University Affiliated Cancer Hospital, Nanjing, China
[b] School of Medicine, Jiangsu University, Zhenjiang, China



ARTICLE INFO

Keywords:
Peripherally inserted central catheter
Spontaneous migration
Azygos vein
Esophageal cancer
Thoracic surgery

ABSTRACT

This case report presents an incident of spontaneous migration of a peripherally inserted central catheter (PICC) into the azygos vein, leading to accidental transection during surgery. A patient with esophageal cancer had a PICC placed in the left upper arm one day prior to surgery, with the catheter tip confirmed by intracavitary electrocardiogram (IC-ECG) and anterior/lateral chest X-ray imaging. However, during the surgery, the PICC was unintentionally cut when the surgeon isolated and clamped the azygos vein. The surgical team removed the catheter and re-sutured the azygos vein remnant, introducing avoidable risks. This report analyzes the spontaneous migration of the PICC to the azygos vein and explores possible contributing factors to this incident.

Case Report

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Changmin Mao [a,#], Yuying Shi [a,b,#], Meixiang Wang [a], Qian Zhao [a], Min Ding [a], Ping Zhu [a],

any postural changes occur between PICC placement and surgery.

On January 3, the patient underwent cervical-thoracic-abdominal triple-incision radical esophageal cancer surgery at 09:30 am. Catheter function was evaluated with no abnormalities, and fluids were infused via the PICC. The patient was successfully anesthetized before being placed in the left lateral decubitus position, and the procedure was performed as planned. At 11:30 am, the anesthesiologist and nurse observed a halt in the PICC infusion during the surgical step of isolating and clipping the azygos vein. Further examination revealed that the catheter was completely obstructed, and prompt measures were taken to establish alternate access through the peripheral vein to resume infusion. Given the timing of the infusion disruption and clipping of the azygos vein, we suspected that the PICC had been ligated and severed. The PICC nurse was summoned to the operating room. After reviewing the anterior and lateral chest radiograph that had initially confirmed the correct placement of the catheter, it was determined that the PICC had later migrated into the azygos vein and was subsequently ligated and severed during surgery. The ligature was loosened and the catheter segments were removed. By rejoining and inspecting the catheter scale and comparing it with the original insertion length, we confirmed that the entire catheter was fully extracted from the body. Surgery proceeded to the next stage (Fig. 2).

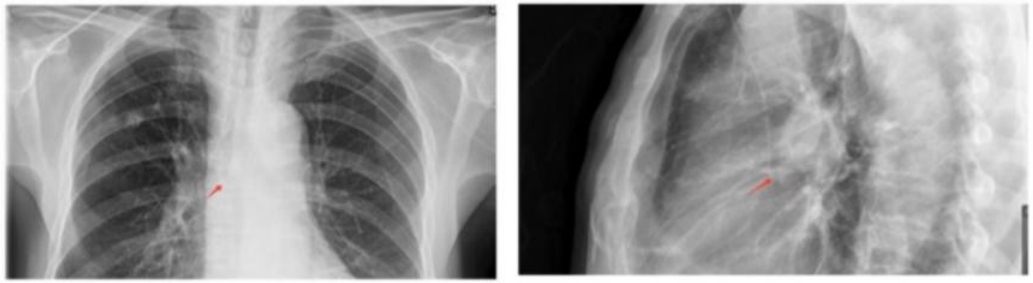


Fig. 1. Anterior/lateral chest X-ray showing the tip of the catheter was correctly positioned in the superior vena cava (SVC

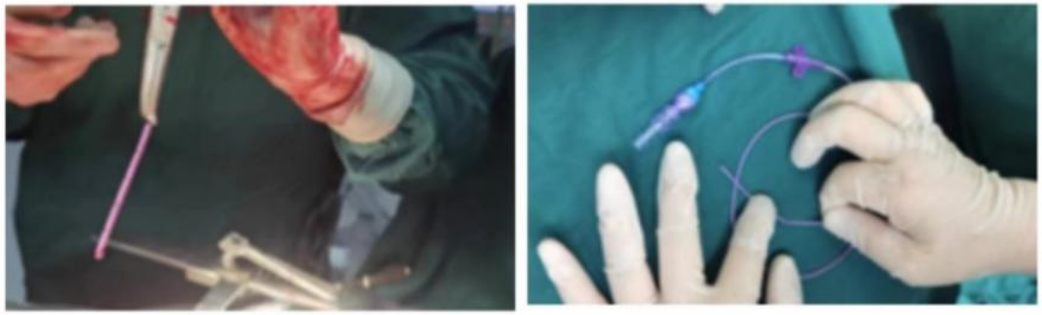


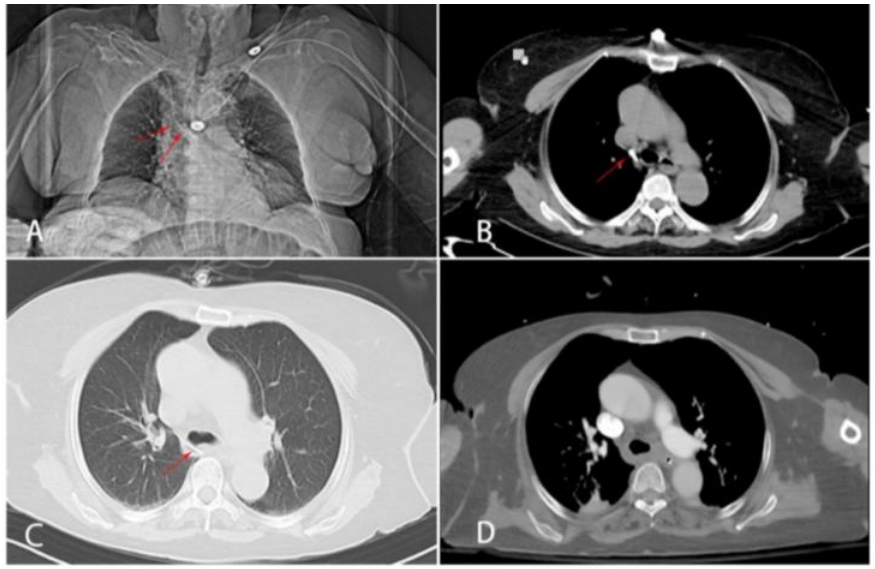
Fig. 2. Catheter removal was verified by comparing its length to the insertion length after rejoining segments.

Feng *et al. Journal of Cardiothoracic Surgery* (2024) 19:259
https://doi.org/10.1186/s13019-024-02708-9

Journal of Cardiothoracic Surgery

CASE REPORT **Open Access**

On the way to the azygos vein: a road of return rather than ruined



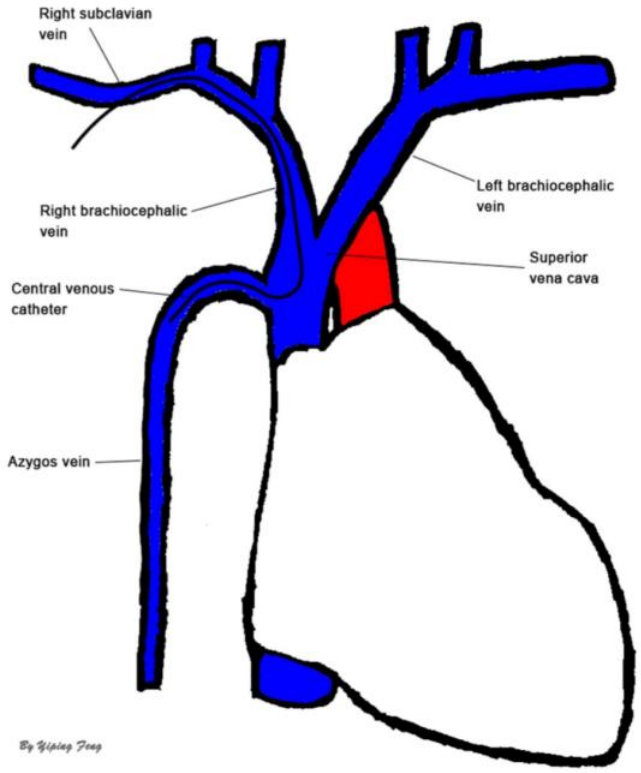


Fig. 1 (**A**) Chest radiograph showing a central venous catheter inserted via the right subclavian vein and the catheter kinking at the right tracheobronchial angle (red arrows); (**B**) Axial slice from the chest CT scan shows the catheter tip projecting from the posterior wall of the superior vena cava (red arrow); (**C**) The CVC deviated anteriorly towards the thoracic vertebrae (red arrow); (**D**) Post-operative contrast-enhanced chest CT revealed no pleural effusion or mediastinal fluid accumulation

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International Journal of Nursing Studies

journal homepage: www.elsevier.com/locate/ijns

2018

Handgrip exercise reduces peripherally-inserted central catheter-related venous thrombosis in patients with solid cancers: A randomized controlled trial

Kouying Liu[a,b,1], Ye Zhou[b,c,1], Weiping Xie[a], Zejuan Gu[d], Yu Jin[a], Xinhua Ye[e], Xuesong Chen[a], Boqiang Fan[f], Hong Wang[a,*], Yan Cui[b,**]

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[b] School of Nursing, Nanjing Medical University, Nanjing, China
[c] Chinese Nursing Association, Beijing, China
[d] Department of Nursing, The First Affiliated Hospital of Nanjing Medical University, Nanjing, China
[e] Department of Ultrasonography, The First Affiliated Hospital of Nanjing Medical University, Nanjing, China
[f] Department of Oncology Medicine, The First Affiliated Hospital of Nanjing Medical University, Nanjing, China

Objectives: To examine the effectiveness of handgrip exercise using an elastic ball to prevent peripherally-inserted central catheter-related venous thrombosis in patients with solid cancers.
Design: A randomized controlled trial.
Settings: One teaching hospital in Nanjing, China.
Participants: In total, 120 subjects with solid cancers were eligible; each had a new peripherally-inserted central catheter. They were recruited and randomly assigned into two exercise groups and one control group.
Methods: Subjects from exercise groups 1 and 2 performed a 3-week, 25-repetition handgrip exercise, 3 and 6 times daily, respectively. The control group subjects performed a gentle limb exercise with no frequency and intensity requirements. Ultrasound was used to detect venous thrombosis development and examine axillary vein blood flow over the three points.
Results: There were 32 cases of peripherally-inserted central catheter-related venous thrombosis detected. Two venous thrombosis cases in the control group were symptomatic, but all venous thrombosis cases in the exercise groups were asymptomatic. All venous thromboses were partial. There were significant differences in the incidence of venous thrombosis among the three groups ($\chi^2 = 12.813$, $p = 0.002$; $\chi^2 = 9.340$, $p = 0.009$; $\chi^2 = 11.480$, $p = 0.003$; and $\chi^2 = 10.534$, $p = 0.005$, respectively) at days 2, 3 and 21. The incidence of venous thrombosis in the two exercise groups was lower than that in the control group over the 3 time points (all, $p < 0.05$). The between-group effects and interaction effect in vein maximum velocity and time-mean flow velocity showed significant differences ($F = 4.180$, $p = 0.025$; $F = 4.010$, $p = 0.045$; and $F = 2.928$, $p = 0.025$) at days 2, 3, and 21, respectively. The axillary vein blood flow parameters in the control group were lower than those in the two exercise groups at day 21 (all, $p < 0.05$). However, no significant differences occurred in the incidence of venous thrombosis and axillary vein blood flow parameters between the two exercise groups.
Conclusion: Handgrip exercise using an elastic ball daily for three weeks could decrease the incidence of

120 pazienti randomizzati in 3 gruppi

- Group 1 : 25 handgrip exercises 3 volte/die
- Group 2: 25 handgrip exercises 6 volte/die
- Control group

Doppler a 2, 3 e 21 giorni.

Aumentate velocità in vena ascellare nei gruppi sottoposti ad esercizio

Table 3
Comparisons of axillary vein maximum velocities by group over the four time points.

Group	axillary vein maximum velocity[cm/s, M ± SD]				Between groups F (*p*-value)	Within groups F (*p*-value)	Interaction effect F (*p*-value)
	Baseline	Day 2	Day 3	Day 21			
Control group	12.63 ± 4.59	11.50 ± 6.81	14.05 ± 7.61	8.11 ± 8.92	4.180 (0.025*)	1.317 (0.274)	2.928 (0.0 25*)
Exercise group 1	16.36 ± 9.31	19.12 ± 9.69	17.59 ± 10.67	20.80 ± 9.94*			
Exercise group 2	15.05 ± 7.12	17.67 ± 4.56	18.25 ± 9.16	25.68 ± 15.50*			
F	0.973	3.438	0.659	7.819			
[A, B, C]	[3.731, 2.417, 1.314]	[7.621, 6.174, 1.446]	[3.550, 4 .200, 0.660]	[12.693, 17.586, 4.875]			
p-value	0.390	0.045*	0.525	0.002*			
[A, B, C]	[0.176, 0.558, 0.751]	[0.016*, 0.182, 0.753]	[0.311, 0.420, 0.901]	[0.002*, 0.005*, 0.406]			

M = mean; SD = standard deviation; * Compared with control group at the same time point $p < 0.05$.
A, control group vs. exercise group 1; B, control group vs. exercise group 2; C, exercise group 1 vs. exercise group 2.

2018

Durata e frequenza

Original Article

Effects of tai chi on catheter management and quality of life in tumor patients with PICC at the intermission of chemotherapy: a non-inferiority randomized controlled trial

Yuehua Ding[1#], Lijun Ji[2#], Yue Hu[3]

2020

Background: Peripherally inserted central catheter (PICC) is widely used in chemotherapy due to its minimal complications and simple wound care. This study explored the effects of tai chi on catheter-related complications, catheter management ability, and quality of life in tumor patients with PICC at the intermission of chemotherapy.

Methods: This study was an open parallel trial. A total of 98 patients with malignant tumors who underwent long-term chemotherapy with PICC were randomly divided into an observation group (49 cases) and a control group (49 cases). The control group received grip strength exercise for 3 months, while the observation group received 24 simplified tai chi exercises. The coagulation function, thrombosis rate, self-management ability, and quality of life were compared between the two groups before and after the intervention.

Results: After the intervention, the activated partial thromboplastin time (APTT) and prothrombin time (PT) in the observation group were longer than those in the control group, while fibrinogen (FIB) was lower than that in the control group (all $P<0.05$). After the intervention, the total score of self-management ability of the observation group was higher than that of the control group ($t=2.038$, $P=0.047$), and the scores of exercises ability and quality of daily life with catheters were significantly increased (all $P<0.05$). In terms of quality of life, scores of role-physical (RP), social functioning (SF), mental health (MH) and role-emotional (RE) in the observation group were higher than those in the control group (all $P<0.05$), while there was no statistical difference between the bodily pain (BP) scores of the observation group and the control group ($P>0.05$). The incidence of venous thrombosis in the observation group was lower than that in the control group, the difference was statistically significant ($\chi^2=4.439$, $P=0.035$).

Conclusions: Tai chi can prevent PICC thrombosis, reduce PICC-related complications, improve self-management ability, and improve quality of life in at-home patients with long-term PICC.

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2021

ORIGINAL ARTICLE

Is it safe to exercise during oncological treatment? A study of adverse events during endurance and resistance training – data from the Phys-Can study

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ABSTRACT

Introduction: Few studies have systematically evaluated the risk of adverse events (AEs) among persons exercising during oncological treatment. We aimed to describe incidence and types of AEs during exercise for persons undergoing oncological treatment, and associations to exercise intensity, exercise adherence, chemotherapy treatment, initial aerobic fitness. A second aim was to compare incidence of lymphedema, periphery inserted central catheter (PICC) complications, and other new medical conditions (any illness or injury occurred during the exercise trial) between high-intensity vs low-to-moderate exercise and usual care (UC).

Methods: This descriptive, comparative study was based on data from an observational study including patients in an UC setting ($n = 90$) and a randomized exercise trial ($n = 577$) in which participants exercised at high-intensity (HI) or low-moderate intensity (LMI). Persons with breast, prostate, or colorectal cancer undergoing neo/adjuvant treatment were included. AEs were reported by exercise coaches, participants, and identified in medical records, as were lymphedema, PICC-complications, and new medical conditions.

Results: Coaches reported AEs for 20% of the participants, while 28% of participants self-reported AEs. The most common coach- and participant reported AEs were musculoskeletal and the majority (97%) were considered minor. HI had higher likelihood of AEs than LMI, according to both coaches (OR: 1.9 [95%CI 1.16–3.21], p=.011) and participants (OR: 3.36 [95%CI 2.00–5.62], <.001). Lymphedema rates were low (4-9%) and PICC complications ranged from 15% in LMI to 23% in UC and there were no statistically significant differences between HI, LMI, and UC. There were no statistically significant differences between HI and LMI regarding new medical conditions.

Conclusions: Exercise during treatment is safe for these patient groups in this setting, even HI exercise can be recommended if no medical contraindications are present. Similar to healthy populations, a higher risk of having minor AEs when exercising at HI in comparison to LMI may exist.

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KEYWORDS
Physical exercise; adverse events; oncology; peripherally inserted central catheter; lymphedema

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ORIGINAL ARTICLE

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2021

Is it safe to exercise during oncological treatment? A study of adverse events during endurance and resistance training – data from the Phys-Can study

Anna Henriksson[a], Birgitta Johansson[b], Calin Radu[b], Sveinung Berntsen[a,c], Helena Igelström[d] and Karin Nordin[a]

Incidence of lymphedema	Total	Care as usual	HI	LMI
	N = 443	*N* = 50	*N* = 198	*N* = 198
Participants with lymphedema[f] n (%)	30 (6.8)	2 (4.0)	17 (8.6)	11 (5.6)
Missing n (%)	52 (10.5)	13 (18.6)	15 (7.0)	18 (8.5)
Participants with PICC[g]	*N* = 303	*N* = 30	*N* = 132	*N* = 141
Participants with PICC comp. n (%)	51 (16.5)	7 (23.3)	23 (17.4)	21 (14.9)
Missing n (%)	34 (11.2)	5 (20.0)	19 (14.4)	10 (7.0)
Type of complication				
Thrombosis, n (%)	11 (19.6)	2 (28.6)	4 (15.4)	6 (24.0)
Infection, n (%)	13 (23.2)	1 (14.3)	6 (23.0)	6 (24.0)
Dislocation, n (%)	9 (16.0)	0 (0.0)	6 (23.0)	3 (12.0)
Thrombophlebitis, n (%)	4 (7.1)	0 (0.0)	2 (7.7)	2 (8.0)
Other[h], n (%)	19 (33.9)	3 (42.8)	8 (30.8)	8 (32.0)
Missing, n (%)	3 (0.9)	1 (14.3)	2 (1.5)	0 (0.0)
Other new medical conditions	*N* = 475		*N* = 233	*N* = 242
Participants with new conditions, n (%)	61 (11.6)		33 (12.6)	26 (9.9)
Type of new condition[i]				
Musculoskeletal and connective tissue[j], n (%)	24 (4.6)		14 (5.5)	10 (3.8)
Accidents/injuries[k], n (%)	5 (0.1)		3 (1.1)	2 (0.8)
Pulmonary symptoms/conditions[l], n (%)	3 (0.5)		1 (0.4)	2 (0.8)
Cardiovascular symptoms/conditions[m], n (%)	9 (1.7)		4 (1.5)	5 (1.9)
Other[n], n (%)	23 (4.4)		12 (4.5)	10 (3.8)
Missing total, n (%)	102 (17.7)		55 (19.1)	47 (16.3)

PICC port

Case report

JVA The Journal of Vascular Access

2021

Secondary malposition of a PICC-port due to heavy physical exercise: A case report

The Journal of Vascular Access
1–4

DOI: 10.1177/11297298211039445
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SAGE

Sonia D'Arrigo[1], Maria Giuseppina Annetta[1], Andrea Musarò[2], Mariagrazia Distefano[2] and Mauro Pittiruti[3]

Abstract

Physical exercise is often encouraged in cancer patients, mainly for the purpose of rehabilitation and for its psychological benefit. Some authors also suggest that exercise—specially in patient with peripherally inserted central venous access devices—may contribute to reduce the risk of catheter-related thrombosis. Still, the impact of physical exercise on the risk of device-related complications is not yet defined.

We report a case of secondary migration of the tip of an arm port, caused by high-intensity exercise in a woman undergoing chemotherapy because of ovarian cancer. Tip migration was suspected because of malfunction (persistent withdrawal occlusion) and diagnosis established after ultrasound examination and chest x-ray.

Even if exercise may yield benefit in the cancer patient on chemotherapy, the risk of mechanical complication of the venous access device—such as tip migration—should be considered in the case of high-intensity exercise.

Techniques in vascular access

JVA The Journal of Vascular Access

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1–5

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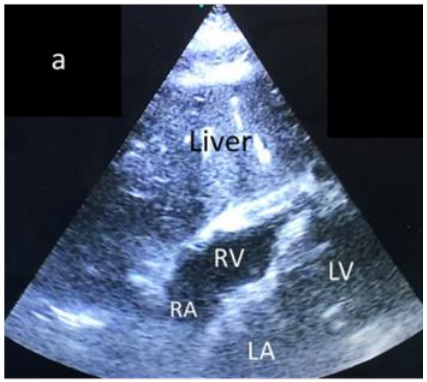
SAGE

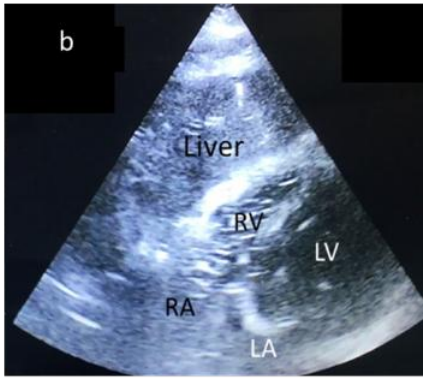
An ultrasound-based technique in the management of totally implantable venous access devices with persistent withdrawal occlusion

Sonia D'Arrigo[1], Maria Giuseppina Annetta[1] and Mauro Pittiruti[2]

Table 1. Patients characteristics

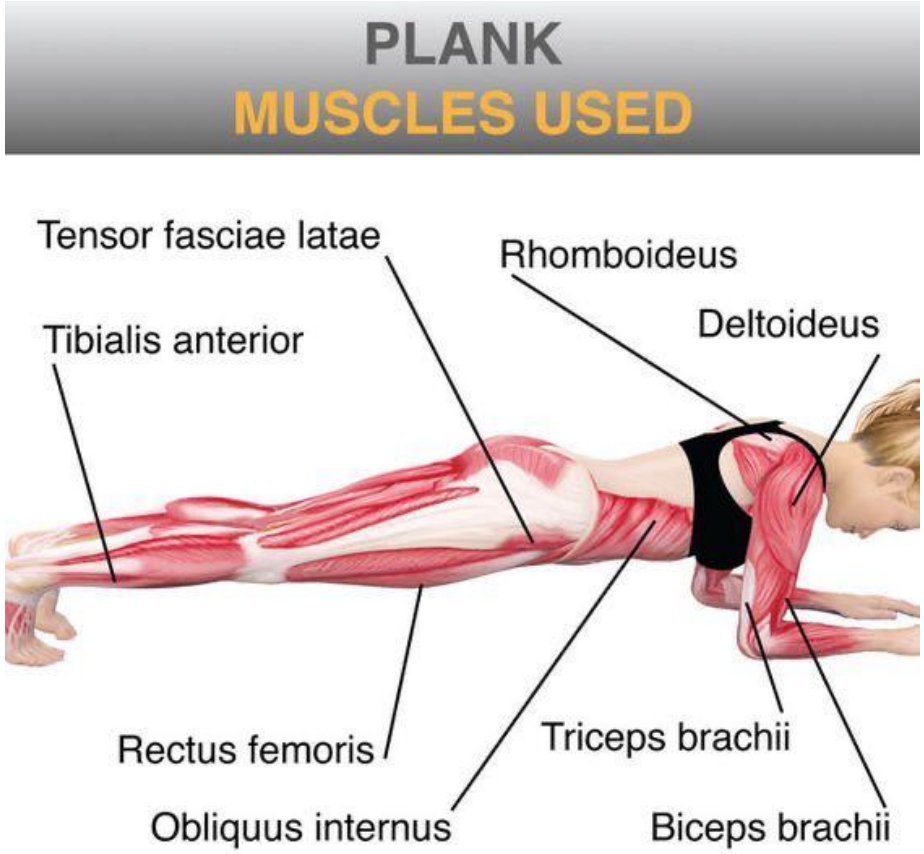
Patients (n°)	Age (years)	Gender	Site of TIVAD	Oncological disease	Problem	Mean time for BT (sec)	X-ray confirmation
1	49	F	Right basilic vein	Ovaric cancer in neoadjuvant chemotherapy	PWO	45	Yes
2	51	F	Right axillary vein	Ovaric cancer post surgery, in chemotherapy	PWO	50	Yes
3	65	M	Left basilic vein	Intestinal cancer post surgery, in chemotherapy	PWO	60	Yes
4	34	F	Left basilic vein	Breast cancer post surgery, in chemotherapy	PWO	40	Yes
5	37	F	Right basilic vein	Breast cancer in neoadjuvant chemotherapy	PWO	30	Yes
6	25	F	Right basilic vein	Ovaric cancer post surgery, in chemotherapy	PWO	45	Yes
7	68	F	Right axillary vein	Uterus cancer post surgery, in chemotherapy	PWO	40	Yes
8	69	M	Right axillary vein	Liver cancer in neoadjuvant chemotherapy	PWO	50	Yes
9	56	F	Right brachial vein	Ovaric cancer post surgery, in chemotherapy	PWO	55	Yes





Nella nostra paziente bubble test negativo…

Non comparsa immediata delle microbolle in atrio e ventricolo destro…



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Sonia D'Arrigo[1], Maria Giuseppina Annetta[1], Andrea Musarò[2], Mariagrazia Distefano[2] and Mauro Pittiruti[3]

Nel nostro caso clinico la migrazione della punta è stata peculiare perché lo sforzo fisico è stato così intenso che il catetere è rientrato completamente nelle vene del braccio.

Inoltre, la natura dello sforzo fisico (esercizi con il plank) era piuttosto insolita.

Take-home messages

- Prima di iniziare l'infusione antiblastica verificare il corretto funzionamento del catetere (prelievo e facile infusione salina)
- In caso di PWO, l'infusione antiblastica non può essere somministrata e deve essere esclusa una posizione anomala della punta del catetere o altri problemi meccanici
- controllare la posizione della punta tramite un'ecocardiografia transtoracica con "bubble test"
- eseguire una valutazione ecografica di tutta l'area cervico-toracica cercando di visualizzare il catetere
- se tali manovre non forniscono informazioni sufficienti, eseguire una radiografia del torace

Conclusioni - Cause principali

- **Movimenti del paziente** (flessioni/estensioni del braccio, movimenti del collo e del torace)
- **Aumenti di pressione intratoracica** (tosse violenta, vomito, starnuti, sollevamento pesi)
- **Fattori anatomici/fisiologici** (es. aritmie, stenosi o trombosi venose)
- **Dispositivo** (lunghezza non adeguata (**catetere 'corto'**), materiale troppo morbido)
- **Tecniche di gestione non corrette** (lavaggi con pressione eccessiva, pressione negativa durante il prelievo con siringhe piccole, eccessiva trazione o spinta del catetere, errata manipolazione durante il cambio linee/medicazioni)
- **Problemi di fissaggio** (stabilizzazione non corretta)

Conclusioni - prevenzione

- Cateteri in poliuretano
- Tip location accurata mediante ECG intracavitario
- Adeguata tecnica di impianto
- Gestione corretta
- Fissaggio stabile
- Sconsigliare esercizi fisici estremi

GAVeCeLT
Gli Accessi Venosi Centrali a Lungo Termine

Gemelli

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Università Cattolica del Sacro Cuore