C-1

Uncovering the barriers: Why patients don't enroll and participate in cardiac rehabilitation.

Bente Skovsby Toft, Ivy Susanne Modrau

Background

In Denmark, approximately 2700 patients undergo open-heart surgery annually. Post-surgery, they are recommended to participate in a cardiac rehabilitation programme to enhance their health and well-being. The patients' experiences are often overlooked, yet their perspectives are crucial for understanding non-participation and dropout in cardiac rehabilitation and effectiveness of intervention. Little is known about of patients' decisions to participate in cardiac rehabilitation.

The aim of this study is to explore the decision process and underlying reasons for not attending cardiac rehabilitation among patients and their relatives.

Method

The study is a part of a larger study with a qualitative participatory design, based on the framework for developing complex interventions. The Metro Mapping method was used to identify gaps and unmet needs including consultations with key stakeholders at two university hospitals and in selected municipalities in Denmark. Semi-structured interviews are conducted with patients and their relatives. Interview participants were purposively sampled among patients who had undergone surgery, but not participated in cardiac rehabilitation 12 weeks post-operatively. The study is conducted in collaboration with five patient partners.

Results

Data collection is ongoing and continues through the summer of 2024. The empirical material consists of field notes, interview transcripts, and documents. Findings will be presented at the conference in the form of metro maps and preliminary interview themes.

Conclusion

The results will inform the subsequent development, testing, and implementation of a co-designed flexible cardiac rehabilitation program with a focus on patient involvement to differentiate the patient pathways.

C-2

Nurse led discharge information to patients who have undergone CABG-surgery

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[1] Helse Bergen

Abstract

Aim: To explore how nurses can effectively convey discharge information to patients who have undergone CABG-surgery, with the purpose of improving patient self-care

Method: Literature review. Systematic searches were conducted in the MEDLINE (Ovid) and CINAHL databases from July 31, 2023, to October 31, 2023. Keywords such as CABG, open heart surgery, patient education, discharge information and self-care were used. Pertinent books and other academic literature were utilized as supplements to the findings in the articles.

Results: A total of 13 articles published after the year 2013 were included, comprising both qualitative studies and reviews. Findings from several of these studies indicate that both content and method of mediation are crucial factors in the provision of discharge information to patients who have undergone CABG-surgery. Oral information should be complemented with alternative communication methods, such as brochures or audio recordings, and the content should be tailored to the individual needs of each patient.

Conclusion: Individually tailored discharge information for patients who have undergone CABG-surgery has the potential to enhance patient self-care, prevent complications and readmissions, and reduce the occurrence of anxiety and depression in this group of patients.

C-3

Can heat increase the perfusion index and provide a more reliable measurement of oxygen saturation with a pulse oximeter?

Natalie Karlsson[1], Felicia Olsson Lindstrand[2], Carl Sjödin[2], Lotta Johansson[3]
[1] TIVA, [2] CIVA, [3] NIVA

The pulse oximeter is today a standardized measurement method for assessing the patient's peripheral capillary oxygen saturation and considered one of the most important advances in clinical patient monitoring. The value from the pulse oximeter is used as a basis for decisions regarding medical treatment and nursing interventions. Research has shown that a pulse oximeter with low perfusion, which is measured as the perfusion index (PI), can give an incorrect value. To explore whether heat can increase PI and provide a more reliable measurement of oxygen saturation can create better conditions for decisions and treatment for severely critically ill patients cared for in intensive care.

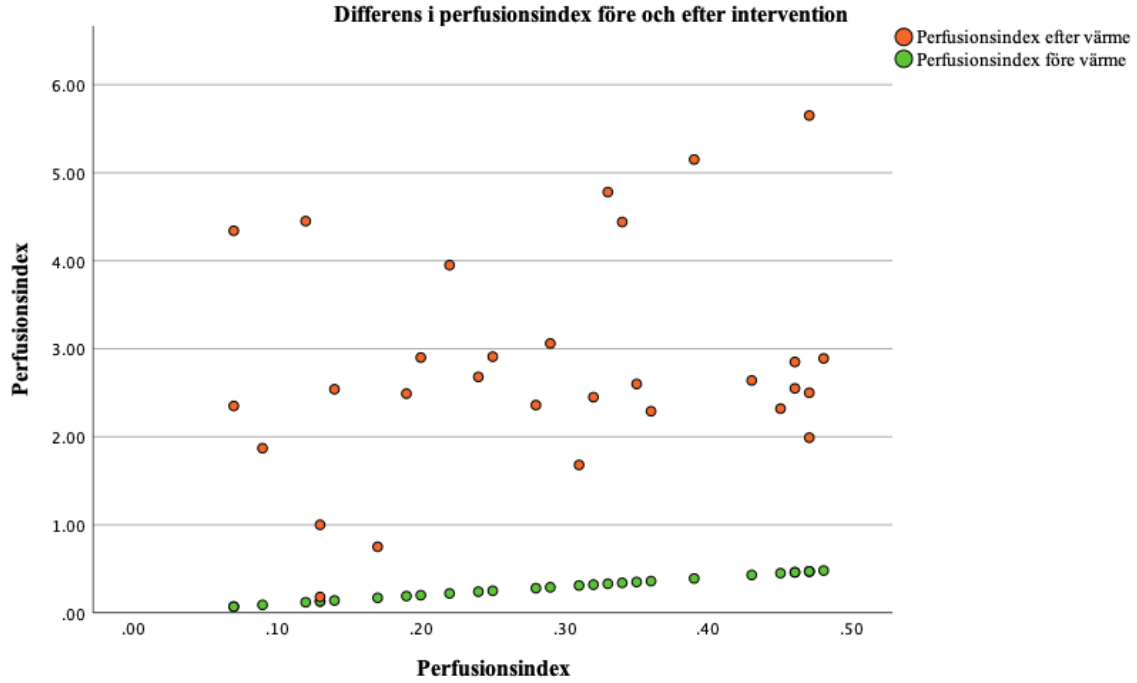
The aim was to explore whether a PI ≤0,5 (finger measure) with the help of heat can be improved and provide a more reliable measurement of the saturation value in patients cared for in the intensive care unit.

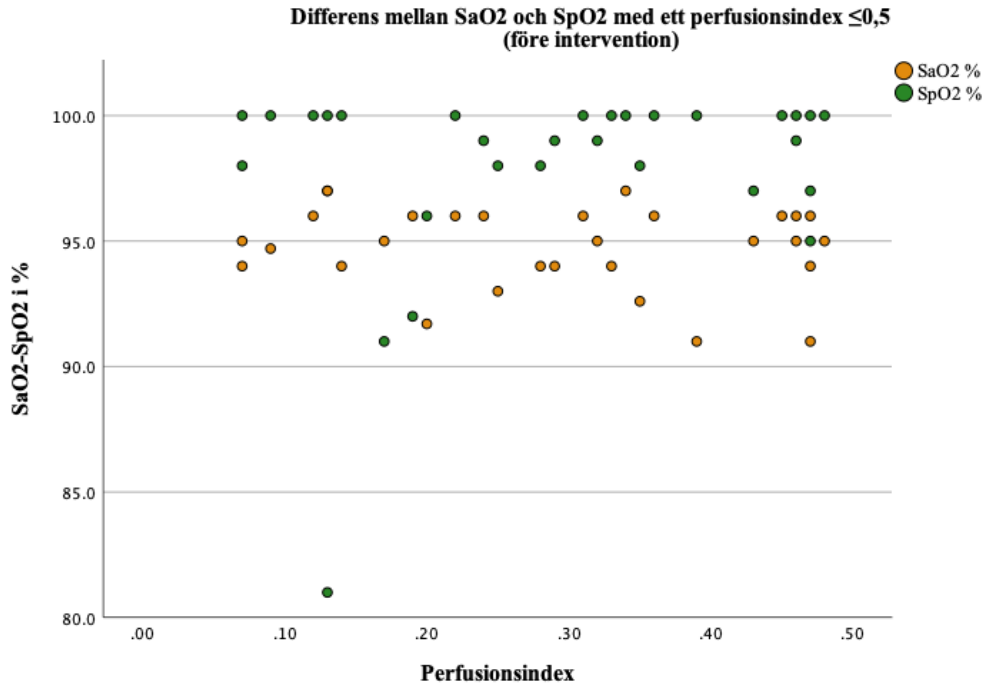
An experimental quasi-method with a pre- and post-test design was conducted. A total of 30 patients were included, each of whom became their own controlgroup. Perfusion index ≤0,5 was identified, heat was applied and SaO2, SpO2, PI, and norepinephrine were documented before and after intervention. Data were analyzed using non-parametric Mann-Whitney's -U test and Wilcoxon-Signed-Rank test. The result shows that heat increases PI (p-value <0,001). With heat, the median value of PI increased from 0,3% to 2,57%. Interestingly, SpO2 and SaO2 became more consistent with a PI ≥ 2,57%.

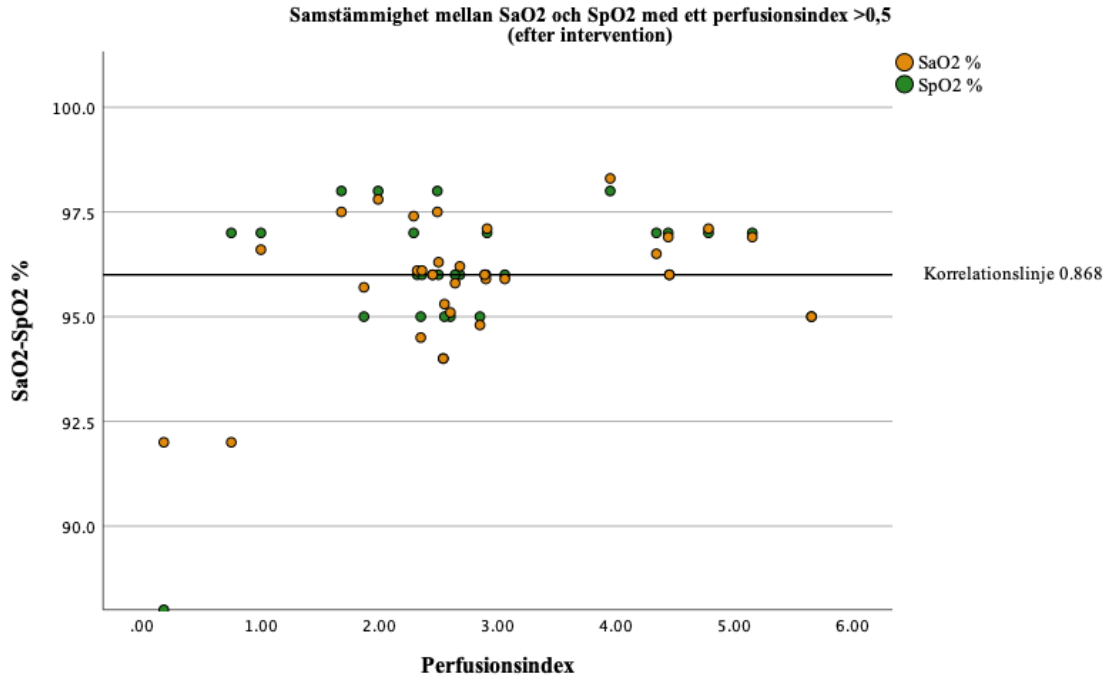
Heat increases the perfusion index by 757%. A perfusion index >2,57% increases the unanimity between SpO2 and SaO2.

	Före värme				Efter värme				Differens medianvärde			
Variabel												
n = 30	Min	Max	Median	Kvartil	Min	Max	Median	Kvartil	Differens	Kvartil	P-värde	NF*
PI %	0,07	0.48	0.3	0.27	0.18	5.65	2.57	0.97	-3	3	<0,004	Nej
SpO2 %	81.0	100	99.5	2.0	88.0	98.0	96	2	1	2.4	<0,003	Nej
SaO2 %	91.0	97.0	95.0	2.0	92.0	98.0	96	1.7	-2.29	0.84	<0,001	Nej
Nor* µg/min/kg	0.0	0.4	0	0.06	0.0	0.4	0.06	0.06	0	0	<0,305	Nej

*Normalfördelning
*Noradrenalin






Samstämmighet mellan SaO2 och SpO2 med ett perfusionsindex >0,5
(efter intervention)
SaO2 %
SpO2 %
100.0
97.5
95.0
92.5
90.0
SaO2-SpO2 %
.00
1.00
2.00
3.00
4.00
5.00
6.00
Perfusionsindex
Korrelationslinje 0.868

C-4

A study of size-selective renal elimination using a novel human model

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[1] Department of Anaesthesia and Intensive Care, Skåne University Hospital, Lund University, Lund, Sweden

Background

The recently discovered selective glomerular hypofiltration syndromes have increased interest in the actual elimination of molecules in the human kidney. In the present study, a novel human model was introduced to directly measure the single-pass renal elimination of molecules of increasing size.

Materials and Methods

Plasma concentrations of urea, creatinine, C-peptide, insulin, pro-BNP, β2-microglobulin, cystatin C, troponin-T, orosomucoid, albumin, and IgG were analysed in arterial and renal venous blood from 45 patients undergoing Transcatheter Aortic Valve Implantation (TAVI). The renal elimination ratio (RER) was calculated as the arteriovenous concentration difference divided by the arterial concentration. Estimated glomerular filtration rate (eGFR) was calculated by the CKD-EPI equations for both creatinine and cystatin C.

Results

Creatinine (0.11 kDa) showed the highest RER (21.0 ± 6.3%). With increasing molecular size, the RER gradually decreased, where the RER of cystatin C (13 kDa) was 14.4 ± 5.3% and troponin-T (36 kDa) was 11.3 ± 4.6%. The renal elimination threshold was found between 36 and 44 kDa as the RER of orosomucoid (44 kDa) was -0.2 ± 4.7%. The RER of creatinine and cystatin C showed a significant and moderate positive linear relationship with eGFR (r = 0.48 and 0.40).

Conclusion

A novel human model was employed to demonstrate a decline in renal elimination with increasing molecular size. Moreover, RERs of creatinine and cystatin C were found to correlate with eGFR, suggesting the potential of this model to study selective glomerular hypofiltration syndromes.

Figure 1

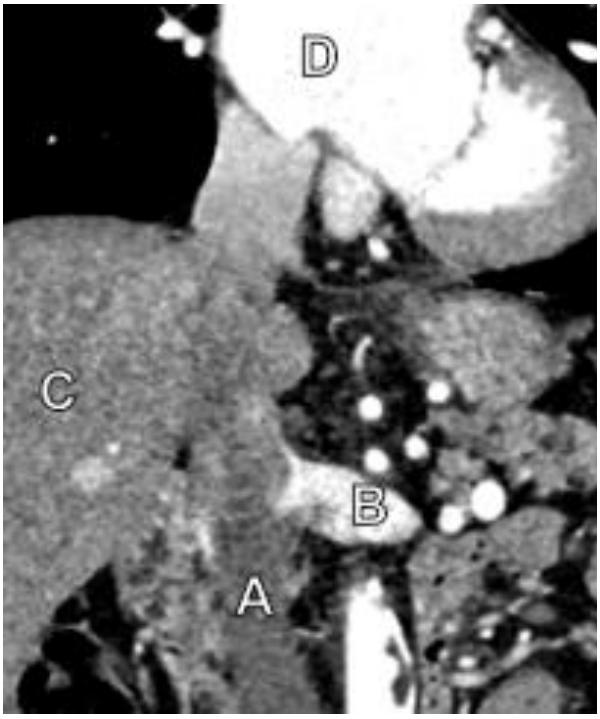
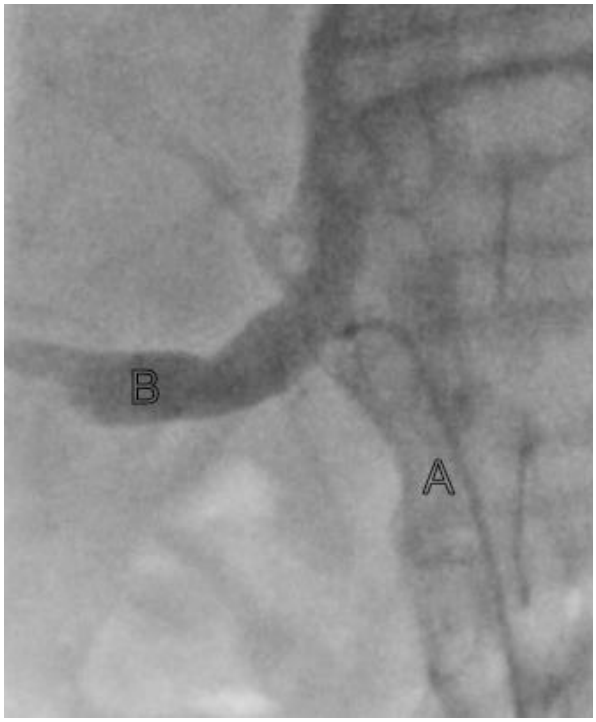


Figure 2



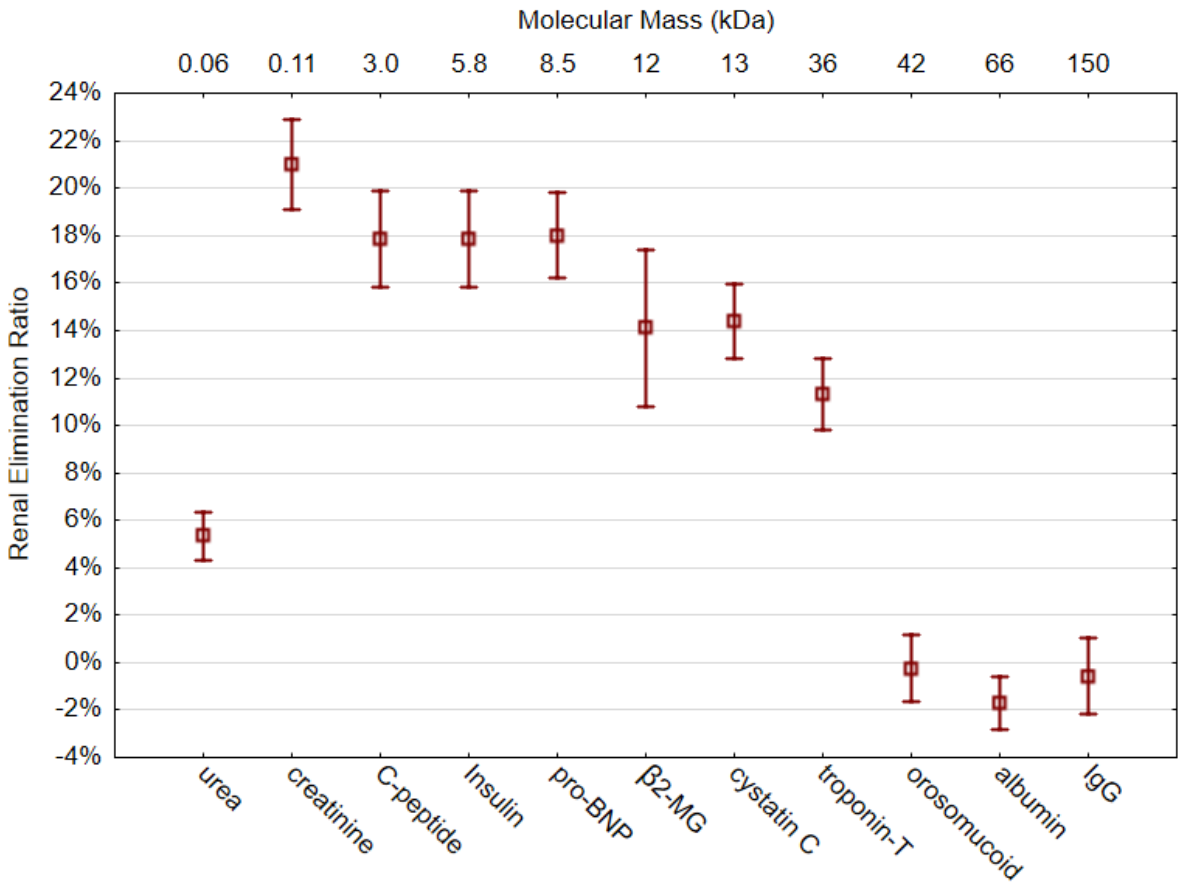

Molecular Mass (kDa)
0.06
0.11
3.0
5.8
8.5
12
13
36
42
66
150
Renal Elimination Ratio
24%
22%
20%
18%
16%
14%
12%
10%
8%
6%
4%
2%
0%
-2%
-4%
urea
creatinine
C-peptide
Insulin
pro-BNP
β2-MG
cystatin C
troponin-T
orosomucoid
albumin
IgG

Figure 3

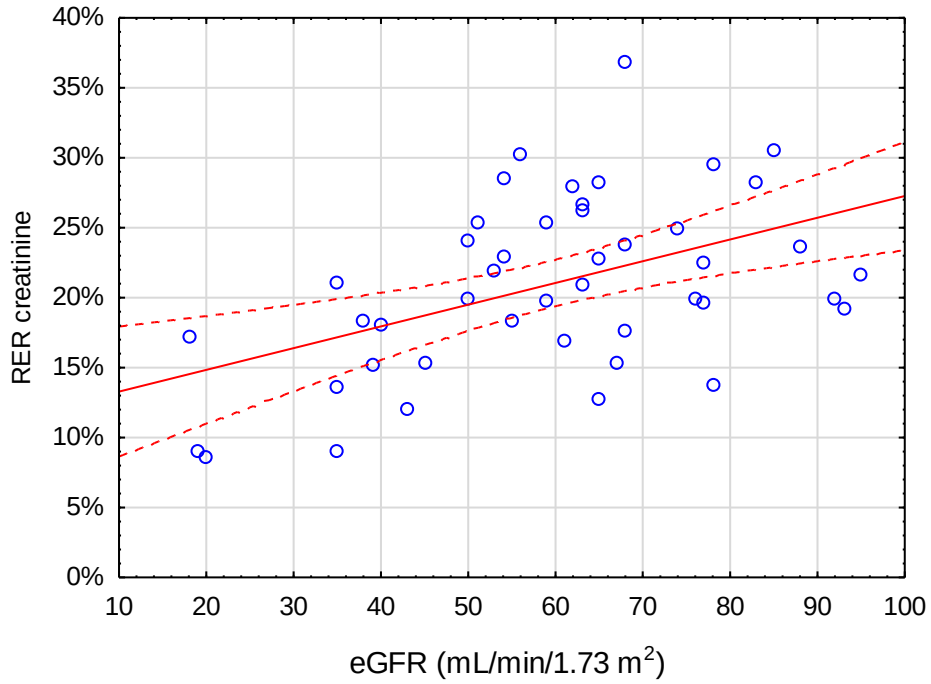

40%
35%
30%
25%
20%
15%
10%
5%
0%
RER creatinine
10
20
30
40
50
60
70
80
90
100
eGFR (mL/min/1.73 m2)

Figure 4

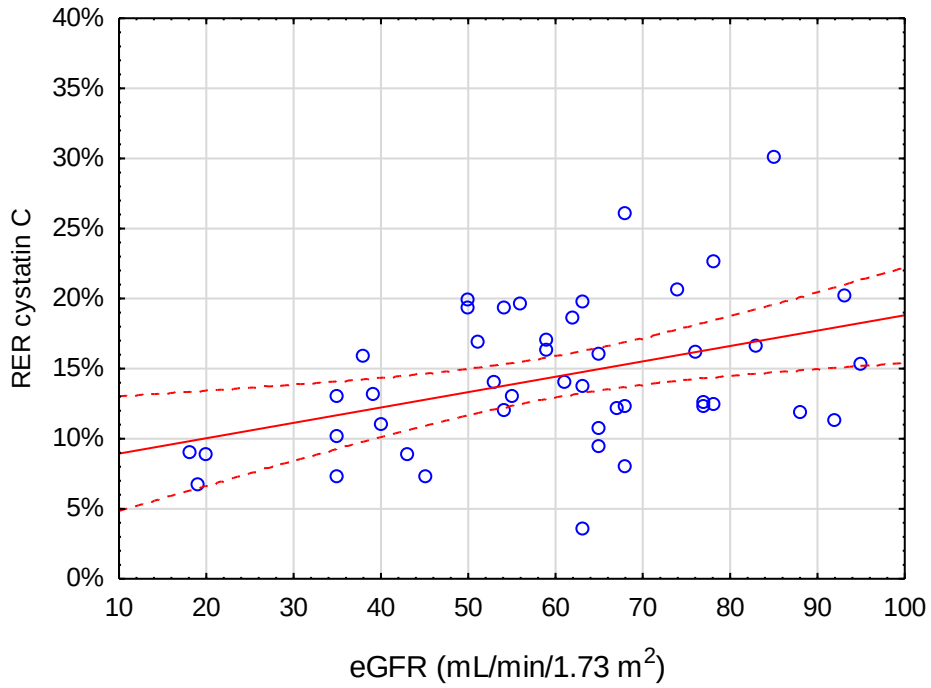

40%
35%
30%
25%
20%
15%
10%
5%
0%
RER cystatin C
10
20
30
40
50
60
70
80
90
100
eGFR (mL/min/1.73 m2)

Figure 5

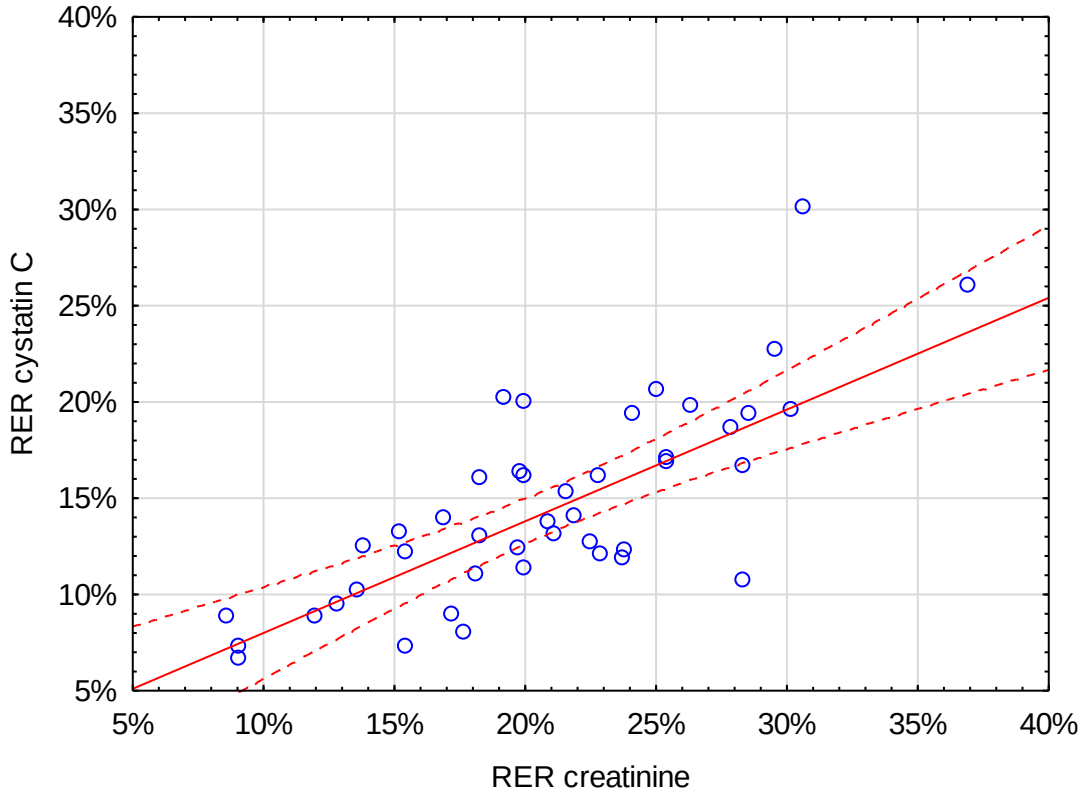


Table 1. Demographics and baseline renal function for the study cohort.

	Mean/no (SD/%)	Range
Male gender	26 (57.8%)	
Age (years)	82.0 (5.5)	70-95
Height (cm)	169.8 (8.5)	153-187
Weight (kg)	76.6 (13.4)	46-110
Hypertension	34 (75.6%)	
Diabetes	10 (22.2%)	
COPD	6 (13.3%)	
Previous stroke	6 (13.3%)	
Peripheral arterial disease	5 (11.1%)	
Atrial fibrillation	18 (40%)	
Pre-op creatinine (µmol/L)	89.6 (38.7)	38-241
Pre-op cystatin C (mg/L)	1.5 (0.6)	0.9-3.5
CKD-EPI eGFR creatinine (mL/min/1.73m^2)	71.5 (20.0)	23-107
CKD-EPI eGFR cystatin C (mL/min/1.73m^2)	47.1 (17.2)	13-89

CKD-EPI eGFR cystatin C/creatinine (mL/min/1.73m^2) 59.6 (19.4) 18-95

SD = Standard deviation. COPD = Chronic Obstructive Pulmonary Disease. CKD-EPI eGFR = estimated glomerular filtration rate according to the Chronic Kidney Disease Epidemiology Collaboration.

Table 2. Measurement results for analytes

Analyte	(N)	Arterial conc. Median (IQR)	p-value*	Venous conc. Median (IQR)	RER Mean ± Std	p-value**
urea (mmol/L)	44	5.9 (5-8)	<0.001	5.6 (5-8)	5.3% ± 3.3%	<0.001
creatinine (µmol/L)	45	78.0 (59-96)	<0.001	60.0 (48-81)	21.0% ± 6.3%	ref
C-peptide (mmol/L)	23	1.0 (0.8-1.2)	<0.001	0.8 (0.6-1.1)	17.8% ± 4.6%	0.009
insulin (mIE/L)	24	6.0 (5-12)	<0.001	5.0 (3-8)	17.8% ± 4.6%	0.010
pro-BNP (ng/L	44	1411 (535-2513)	<0.001	1119 (451-2057)	18.0% ± 6.0%	<0.001
β_2-microglobulin (mg/L)	45	2.6 (2.1-3.3)	<0.001	2.2 (1.9-2.8)	14.1% ± 10.9%	<0.001
cystatin C (mg/L)	45	1.2 (1.0-1.5)	<0.001	1.0 (0.9-1.3)	14.4% ± 5.3%	<0.001
troponin-T (ng/L)	38	23 (18-36)	<0.001	21 (15-33)	11.3% ± 4.6%	<0.001
orosomucoid (g/L)	45	0.7 (0.6-0.9)	0.441	0.7 (0.6-0.9)	-0.2% ± 4.7%	<0.001
albumin (g/L)	45	32 (31-34)	0.042	33 (31-35)	-1.7% ± 3.7%	<0.001
IgG (g/L)	45	9.0 (7-11)	0.495	9.4 (7-11)	-0.6% ± 5.3%	<0.001

Arterial and venous concentrations are presented on the same row. *Comparisons between arterial and venous concentrations **Comparisons with RER for creatinine. RER = Renal Elimination Ratio.

C-5

Management of postoperative atrial fibrillation in the clinical setting – a single centre study

Emilia Johannesson[1], Igor Zindovic[1]
[1] Department of Cardiothoracic Surgery, Lund University, Skåne University Hospital

Background

Postoperative atrial fibrillation (POAF) is observed in 20-50% of patients undergoing cardiac surgery and is associated with increased risk of complications and mortality. We aimed to assess POAF rates after cardiac surgery and analyse the clinical management of POAF including administration of oral anticoagulants (OAC).

Materials and methods

This was a single-centre, retrospective, observational study based on a prospectively included cohort of patients who underwent cardiac surgery between February 2020 and September 2021, at Skåne University Hospital, Lund. All patients undergoing surgery using cardiopulmonary bypass who survived to hospital discharge were included. Patients who underwent redo surgery, transplantation, surgery with circulatory arrest and those with endocarditis were subsequently excluded. POAF data was collected by retrospective chart review.

Results

In total, 1012 patients were included in the study, 432 (43%) of which had at least one episode of POAF. OAC was prescribed to 152 (35%) of POAF patients prior to hospital discharge. Of all POAF patients, 34 (8%) had atrial fibrillation (AF) at discharge, 34 (8%) until 3-month follow-up and 11 (3%) patients had additional documented AF episodes at 1-year follow-up. However, OAC was only terminated in 18 cases by 1-year follow-up. Peak incidence of POAF occurred on postoperative day two, yet 31% of OACs were initiated by cardiothoracic surgeons.

Conclusion

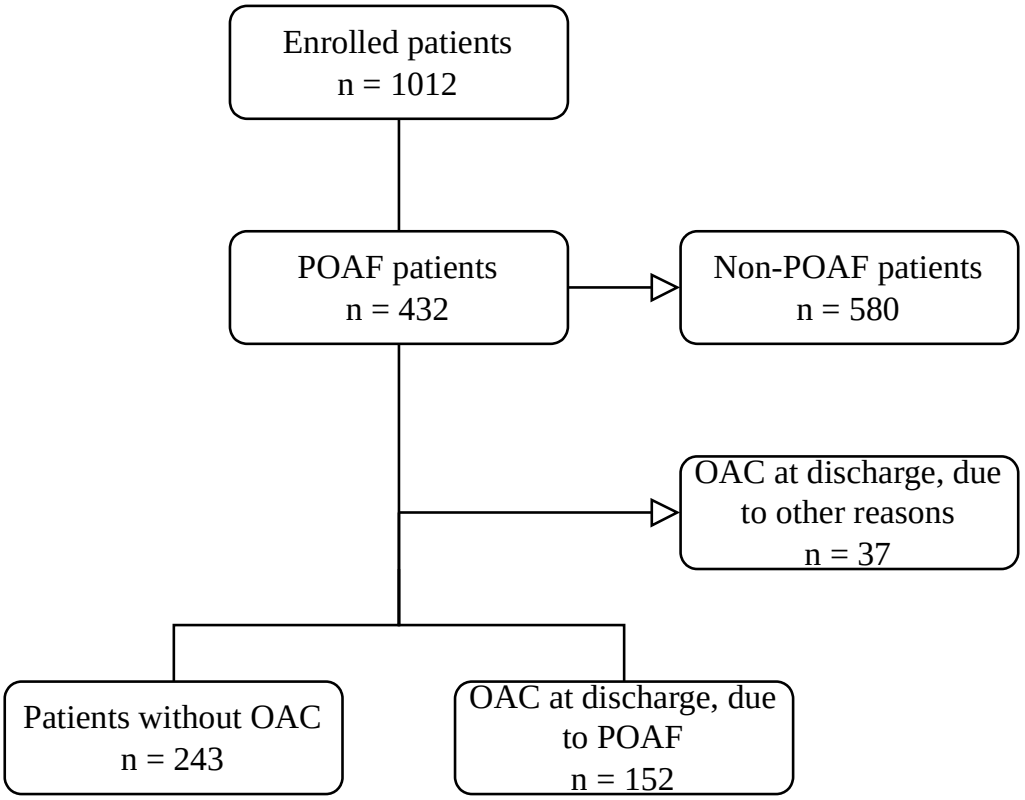
POAF is commonly observed after cardiac surgery. In our cohort, only 3% of patients had evidence of AF between 3 months and 1 year after surgery. However, OACs were rarely discontinued.

Table 1. ***Baseline data of the study population***

Characteristics	**Overall (n = 1012)**	**POAF (n = 432)**	**Non-POAF (n = 580)**	***p***	**Missing**
Age	68 (60-74)	71 (64-76)	65 (57-72)	< 0.001*	0
Female sex	243 (24.0)	92 (21.3)	151 (26.0)	0.081	0
NYHA-class					
I	330 (32.6)	128 (29.6)	202 (34.8)	0.272	0
II	420 (41.5)	182 (42.1)	238 (41.0)		
III	209 (20.7)	96 (22.2)	113 (19.5)		
IV	53 (5.2)	26 (6.0)	27 (4.7)		
Type of procedure					
Isolated CABG	645 (63.7)	244 (56.5)	401 (69.1)	< 0.001	0
Isolated AVR	153 (15.1)	71 (16.4)	82 (14.1)		
CABG + AVR	65 (6.4)	38 (8.8)	27 (4.7)		
Mitral valve repair	53 (5.2)	30 (6.9)	23 (4.0)		
Mitral valve replacement	9 (0.9)	8 (1.9)	1 (0.2)		
Aortic surgery	11 (1.1)	5 (1.2)	6 (1.0)		
Aortic surgery + AVR	39 (3.9)	25 (5.8)	14 (2.4)		
Double valve procedure	8 (0.8)	3 (0.7)	5 (0.9)		
Other procedure	29 (2.8)	8 (1.9)	21 (3.6)		

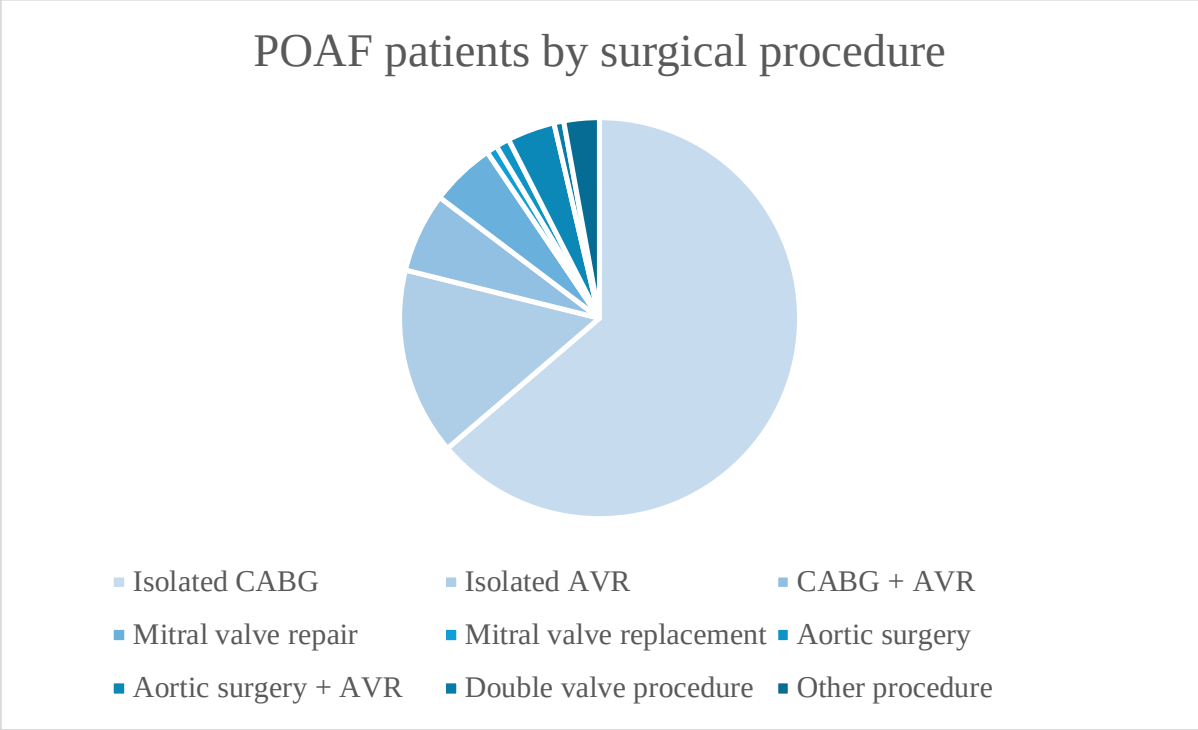
NOTE. *Values are expressed as numbers (%) or median (interquartile range).*
Abbreviations: *NYHA, New York Heart Association; CABG, coronary artery bypass graft; AVR, aortic valve replacement.*
Statistical tests: *Chi-Square test and Mann Whitney U test (*)*

Figure 1. ***A flowchart describing the study design, excluded patients and distribution amongst the sub-groups.***



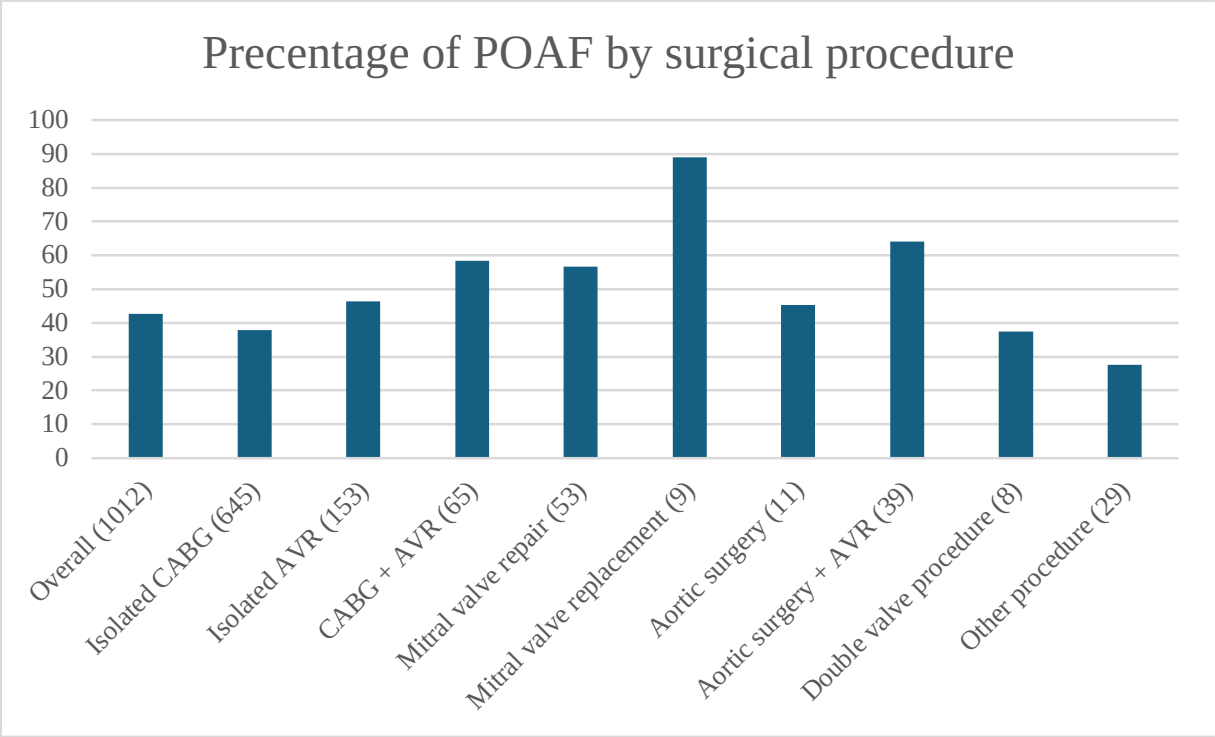
Abbreviations: *POAF, postoperative atrial fibrillation; OAC, oral anticoagulants.*

Figure 2. ***Proportions of the total number of POAF patients (n = 432), demonstrated by different surgical procedures***



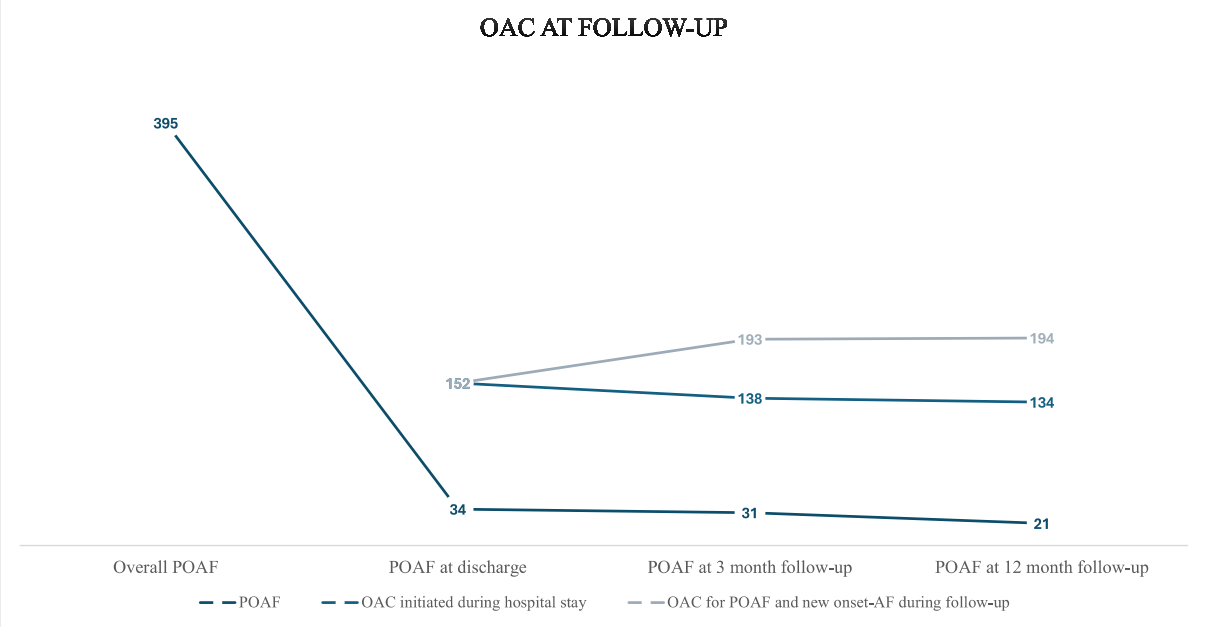
NOTE. *Values are expressed as percentages (%).*
Abbreviations: *CABG, coronary artery bypass graft; AVR, aortic valve replacement.*

Figure 3. ***Incidence of POAF for different surgical procedures***



NOTE. *Values are expressed as percentages (%).*
Abbreviations: *CABG, coronary artery bypass graft; AVR, aortic valve replacement.*

Figure 4. ***Discrepancy between documented persistent AF and OAC prescription during follow-up***



NOTE. *In this figure, all patients with OAC prescription for other reasons than POAF are excluded.*
Abbreviations: *POAF, postoperative atrial fibrillation; OAC, oral anticoagulants.*

C-6

A mediastinal angiomatoid fibrous histiocytoma radically resected with the use of cardiopulmonary bypass and transection of the ascending aorta

Luis Rabelo[1,2], Christine Tolman[1], Vigdís Pétursdottir[1], Brynja Jónsdottir[1], Tómas Guðbjartsson[1,2]
[1] The National University Hospital of Iceland, [2] University of Iceland

Background: Angiomatoid fibrous histiocytoma (AFH) is a rare soft tissue tumor of low malignant potential that occurs most often in children's extremities. AFH can show local invasive growth and up to 15% local recurrence rate. Therefore, the mainstay of management is surgical removal. We report a case of a mediastinal AFH resected utilizing cardiopulmonary bypass and cardioplegic arrest.

Case: A woman in her thirties presented with a five-year history of increasing generalized weakness, night sweats, and periodic fevers, rendering her unable to work. Lab results showed an elevated erythrocyte sedimentation rate (72 mm/hr) and computed tomography (CT) scans revealed a 2,7 x 2,4 cm mass within the deep mediastinum, located posterior to the aortic root and above the left atrium. She underwent surgery through a full median sternotomy. The tumor adhered to the posterior aortic wall and invaded the right pulmonary artery. This necessitated the use of cardiopulmonary bypass and the heart was arrested with cardioplegia. The ascending aorta was transected completely, and the tumor dissected from the aortic wall, left coronary ostium and left main stem. For complete tumor removal, the anterior wall of the right pulmonary artery was resected and then repaired with a 3 x 2 cm bovine patch. Postoperatively pathologic analysis revealed AFH. The patient made a good recovery with symptom relief and normal ESDR five months postoperatively.

Conclusion:

Here we report a rare case of an invasive mediastinal tumor necessitating the assistance of cardiopulmonary bypass and transection of the aorta for a safe radical resection.

C-7

Two cases of severe COVID-19 respiratory failure treated with venovenous extracorporeal membrane oxygenation (VV-ECMO) in Iceland

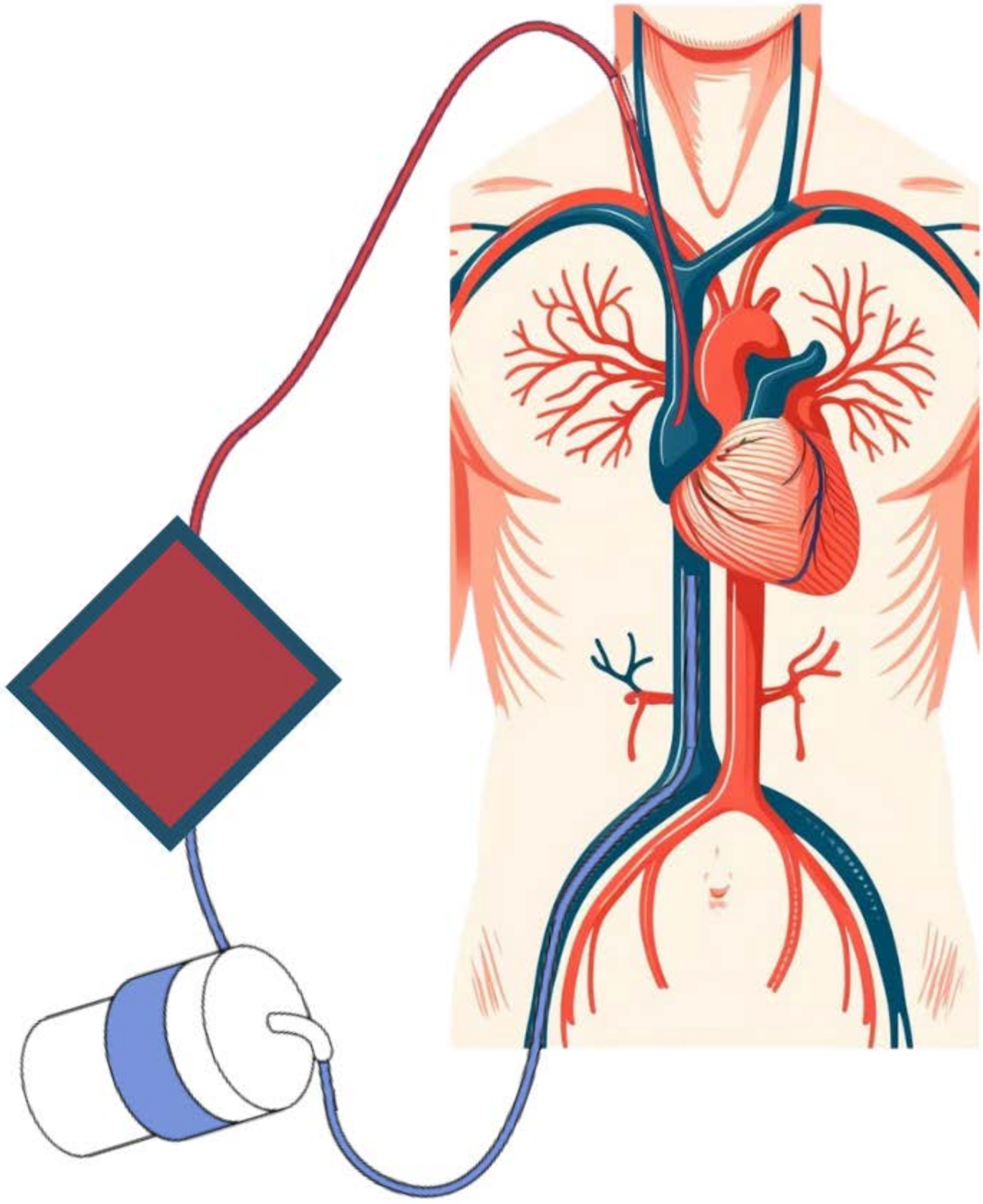
Luis Rabelo[1,2], Sigurður Magnússon[2], Carlos Rabelo[1,2], Bryndís Sigurðardóttir[2], Inga Ingvarsdóttir[2], Tómas Guðbjartsson[1,2]
[1] University of Iceland, [2] The National University Hospital of Iceland

Background: Venovenous extracorporeal membrane oxygenation (VV-ECMO) therapy can be indicated in severe respiratory failure refractory to standard therapy. Managing VV-ECMO is resource-demanding and complex, especially during a pandemic. We report the two VV-ECMO cases during the COVID-19 pandemic in Iceland.

Case 1: An unvaccinated male was admitted to the intensive care unit (ICU) with acute respiratory failure after being found somnolent at his home. He was diagnosed with COVID-19 pneumonia and failed to improve despite treatment including remdesivir, tocilizumab, corticosteroids, and mechanical ventilation with 100% inspired oxygen in the prone position. Persisting severe respiratory acidosis (pH 7.22, PaCO2 75 mmHg) necessitated 9 days of VV-ECMO. He was discharged from the hospital three weeks after VV-ECMO therapy and returned to full-time work 14 months later.

Case 2: A previously healthy, unvaccinated male was treated with invasive mechanical ventilation for 12 days due to COVID-19 acute respiratory failure. Following ICU discharge to the pulmonology ward, he was readmitted due to a bacterial superinfection. Despite treatment on a mechanical ventilator with 100% inspired oxygen and prone positioning, his condition continued to deteriorate (pH 7.01, pCO2 of 127 mmHg) leading to VV-ECMO therapy for 19 days. The patient was discharged to a rehabilitation center approximately two weeks after VV-ECMO therapy and returned to work nine months later in good health.

Conclusion: The successful recovery of both patients underscores the potential of VV-ECMO as a life-saving procedure in severe cases of COVID-19-induced respiratory failure.



C-8

A challenging case of severe bilateral septic arthritis with osteomyelitis of the sternoclavicular joint in a patient with end-stage renal disease.

Chun Yuet Khoo[1], Cynthia Ming Li Chia[1]
[1] National Heart Centre, Singapore

Background

Septic arthritis of the sternoclavicular joint (SCJ) is a rare condition that comprise less than 1% of all joint infections. We report a case of severe bilateral septic arthritis with osteomyelitis of the SCJ in a patient with end-stage renal disease and osteodystrophy on peritoneal dialysis.

Materials and methods

A 44 year-old female with end-stage renal disease and tertiary hyperparathyroidism presented with right SCJ infection one month after recovering from a tenckhoff catheter exit-site infection. She completed six weeks of parenteral antibiotics for presumptive hematogenous seeding despite negative cultures from joint aspiration. However this progressed to bilateral SCJ septic arthritis with osteomyelitis necessitating drainage and excision of bilateral clavicular heads, and multiple surgical debridement with application of negative pressure wound therapy. Cultures grew staphylococcus capitis. Further imaging revealed signs of renal osteodystrophy and superimposed degenerative joint changes resembling calcium pyrophosphate deposition disease.

Results

The patient recovered, eventually underwent pectoralis major flap coverage of bilateral sternal wounds, total parathyroidectomy and retained good shoulder movement.

Conclusions

Severe bilateral septic arthritis with osteomyelitis of the SCJ is challenging to manage, requiring a prolonged course of antibiotics and even repeated surgical drainage. Therefore, prompt assessment in a patient with pain and swelling of the SCJ is necessary to ensure expeditious diagnosis and treatment of this potentially debilitating condition. In patients with predisposing factors such as renal failure, a multidisciplinary team involving thoracic surgery and infectious disease, along with plastic surgery for reconstruction and endocrine surgery for parathyroidectomy is crucial for holistic care.