Cancer Is Associated With AAAs: It's A Chicken And Egg Paradox; Which Came First, The Aneurysm Or The Cancer: Is It Related To Diagnostic And Therapeutic Radiation

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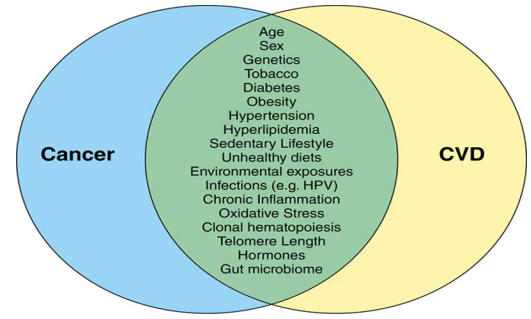
VEITH SYMPOSIUM Connecting The Vascular Community

Disclosures

European Community Fighting Aneurysmal Diseases (FAD) project (FP-7,HEALTH F2-2008 – 200647)

National Heart , Lung and Blood Institute, National Institutes of Health (HL045996)

Fonds pour la chirurgie Cardiaque, Belgium



Synergistic Opportunities in the Interplay Between Cancer Screening and Cardiovascular Disease Risk Assessment, Volume: 138, Issue: 7, Pages: 727-734, DOI: (10.1161/CIRCULATIONAHA.118.035516)

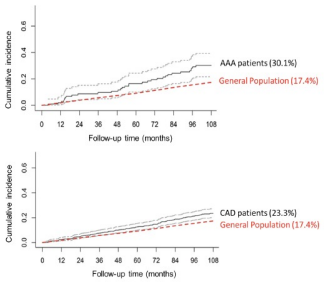
Material & Methods

252 AAA patients with mean age of 73 years old (52 to 92).
(231 males and 21 females)

252 PET-CT
54 (21,4%) patients with (+) history of cancer
(44 Patients with concurrent AAAs And new Cancer)
98/252 (39%)CANCER

Diagnosis of unknown Cancer by PET-CT for AAA

Cumulative risk of developing neoplasia after adjusting for death



Cumulative incidence of neoplasia in AAA and CAD patients (with 95% confidence bands) compared to the expected curve of the Walloon population (competing risk modelling)

INCIDENCE OF THE AAA IN THE 400 PATIENTS* WITH CANCER (identified during PET/CT)

Neoplasia	AAA total	Total neo	%	Mean Diam
Lung	34	155	22%	38,6
Digestif	26	135	19%	37,1
Uro-genital	4	39	10%	42,7
ORL	9	39	23%	36,8
Others	9	37	24%	40,5
	82	405	**20%**	

*Males, Age >65 years.

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Association between PET/CT Scan Findings, Treatment, and Cancer Incidence in a Cohort of AAA Patients

Natzi Sakalihasan [1,2], Samuel Beuls [1], Roland Hustinx [3], Vincent Tchana-Sato [3], Sarah Sakalihasan [4], Rebecka Hultgren [5], Nicos Labropoulos [6], Alain Colige [7], Rodolphe Durieux [1], Pierre Drion [2], Adelin Albert [4], Jean-Olivier Defraigne [1] and Lucia Musumeci [1,2,*]

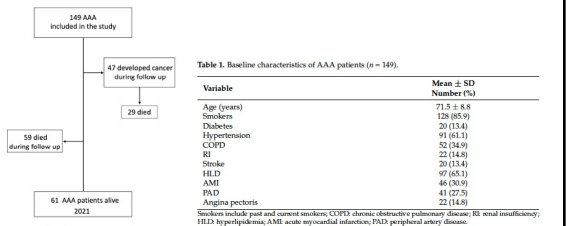

Figure 1. Flowchart of patient selection.

Table 1. Baseline characteristics of AAA patients ($n = 149$).

Variable	Mean ± SD Number (%)
Age (years)	71.5 ± 8.8
Smokers	128 (85.9)
Diabetes	20 (13.4)
Hypertension	91 (61.1)
COPD	52 (34.9)
RI	22 (14.8)
Stroke	20 (13.4)
HLD	97 (65.1)
AMI	46 (30.9)
PAD	41 (27.5)
Angina pectoris	22 (14.8)

Smokers include past and current smokers; COPD: chronic obstructive pulmonary disease; RI: renal insufficiency; HLD: hyperlipidemia; AMI: acute myocardial infarction; PAD: peripheral artery disease.

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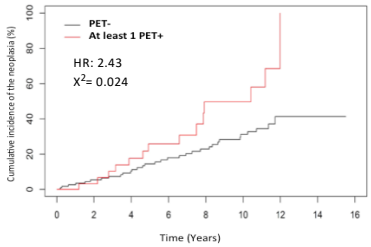
32
At least 1PET +

117
Always PET -



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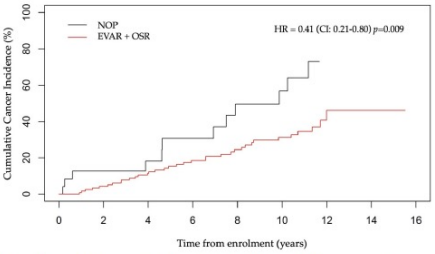

Figure 3. Cumulative cancer incidence in EVAR + OSR vs. NOP group of patients.

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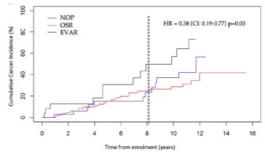
24
Un Operated
12 Neo - (50%)
12 Neo + (50%)

90
OS
67 Neo - (74%)
23 Neo + (26%)

35
EVAR
23 Neo - (66%)
12 Neo + (34%)

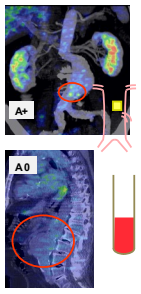


Supplemental Figure S2. Cumulative cancer incidence in NOP, OSR and EVAR group of patients. Comparison of two groups, OSR vs NOP (a) or EVAR vs NOP (b) or three groups OSR vs EVAR vs NOP

Open surgery is protective for cancer after 8 years

Results			
	Cancer (+)	Cancer (-)	*Marginal Row Totals*
Open Repair	23	67	90
EVAR	12	23	35
Marginal Column Totals	35	90	125 (Grand Total)

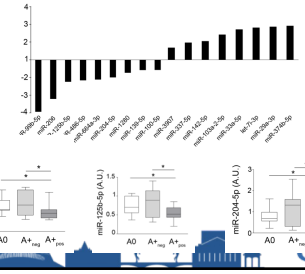
The Fisher exact test statistic value is 0.3772. The result is *not* significant at $p < .05$.



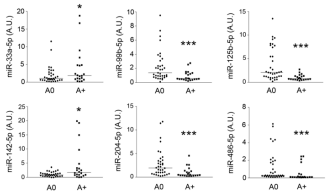
Circulating microRNAs signature correlates with positive [18F]fluorodeoxyglucose-positron emission tomography in patients with abdominal aortic aneurysm

Audrey Courtois, MSc, PhD,[a,b] Betty Nusgens, PhD,[c] Nancy Garbacki, PhD,[c] Roland Hustinx, MD, PhD,[d] Pierre Gomez, MD,[e] Jean-Olivier Defraigne, MD, PhD,[a] Alain C. Colige, PhD,[c] and Natzi Sakalihasan, MD, PhD.[a,b] *Liège, Belgium*

J Vasc Surg. 2017 Apr 18. pii: S0741-5214(17)30103-9. doi: 10.1016/j.jvs.



Results:
6 miRNA were significantly modulated in A+ patients as compared to A0 patients



	SUV max AAA		rSUV AAA/liver		Diameter	
miR-33a-5p	r= +0.313	p=0.01*	r= +0.258	p=0.03*	r= +0.173	p=0.105
miR-99b-5p	r= -0.267	p=0.022*	r= -0.251	p=0.03*	r= -0.118	p=0.19
miR-125b-5p	r= -0.392	p=0.002**	r= -0.365	p=0.003**	r= -0.278	p=0.018*
miR-142-5p	r= +0.179	p=0.091	r= +0.242	p=0.035*	r= -0.138	p=0.153
miR-204-5p	r= -0.277	p=0.018*	r= -0.279	p=0.018*	r= -0.22	p=0.05
miR-486-5p	r= -0.336	p=0.006**	r= -0.29	p=0.015*	r= -0.269	p=0.023*

Review > Nat Rev Genet. 2016 Dec;17(12):719-732. doi: 10.1038/nrg.2016.134. Epub 2016 Oct 31.

A network-biology perspective of microRNA function and dysfunction in cancer

Cameron P Bracken [1 2], Hamish S Scott [1 2], Gregory J Goodall [1 2]

"Many human miRNAs seems to be situated in cancer-associated genomic regions or in fragile locations that are subject to mutation, deletion, amplification or translocation in cancer."

The list of 10 miRNAs found to be involved in both diseases, according to ChatGpt
(Common miRNAs on AAA and Cancer)

miR-21
Known to play a role in promoting cell survival, proliferation, and inflammation.
Overexpressed in various cancers (lung, breast, gastric) and is associated with the inflammatory processes in AAA.

miR-126
Important in vascular integrity and angiogenesis.
Found to be dysregulated in AAA and various cancers, particularly in its role in endothelial cell function.

miR-155
Involved in inflammatory responses and immune modulation.
Upregulated in AAA and several cancers (lymphomas, breast, liver) due to its role in inflammation and immune cell regulation.

miR-221/222
This miRNA cluster is known for regulating vascular smooth muscle cells.
Overexpressed in several cancers (breast, prostate, thyroid) and found to play a role in vascular remodeling in AAA.

miR-29 family (miR-29a/b/c)
Associated with extracellular matrix degradation, which is crucial in both aneurysm formation and cancer progression.
Found to regulate the production of collagen and matrix metalloproteinases, contributing to both AAA and tumor invasion.

miR-92a
Plays a role in endothelial cell function and inflammation.
Altered expression in AAA as well as cancers, where it influences angiogenesis and metastasis.

miR-146a
Known for its anti-inflammatory effects by targeting NF-κB pathway components.
Dysregulated in AAA, as well as in cancers, particularly as it modulates inflammation and immune responses.

miR-15a/16
These miRNAs are involved in apoptosis regulation.
Downregulated in some cancers (such as leukemia) and associated with apoptosis and smooth muscle cell function in AAA.

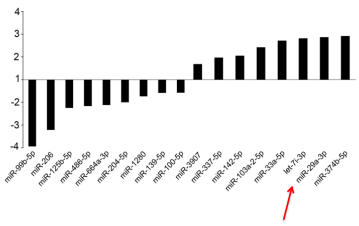
miR-34a
Known for its tumor-suppressor functions.
Involved in regulating cell proliferation and apoptosis in cancer and linked to cell death and smooth muscle function in AAA.

miR-27a/b
These miRNAs influence inflammation and vascular smooth muscle cell function.
Found in AAA and in various cancers, playing roles in cell proliferation and migration.

Circulating microRNAs signature correlates with positive [18F]fluorodeoxyglucose-positron emission tomography in patients with abdominal aortic aneurysm

Audrey Courtois, MSc, PhD,[1,2] Betty Nusgens, PhD,[1] Nancy Garbacki, PhD,[1] Roland Hustinx, MD, PhD,[3] Pierre Gomez, MD,[4] Jean-Olivier Defraigne, MD, PhD,[5] Alain C. Colige, PhD,[1] and Natzi Sakalihasan, MD, PhD,[1,2] Liège, Belgium

miR-21
miR-126
miR-155
miR-221/222
miR-29 family (miR-29a/b/c)
miR-92a
miR-146a
miR-15a/16
miR-34a
miR-27a/b



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Circulation
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Heart Disease and Cancer
Are the Two Killers Colluding?

Circulation
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Heart Failure Stimulates Tumor Growth by Circulating Factors

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EDITORIAL
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Jack of All Trades, or Master of None?

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Synergistic Opportunities in the Interplay Between Cancer Screening and Cardiovascular Disease Risk Assessment
Together We Are Stronger

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Linking Heart Failure to Cancer
Background Evidence and Research Perspectives

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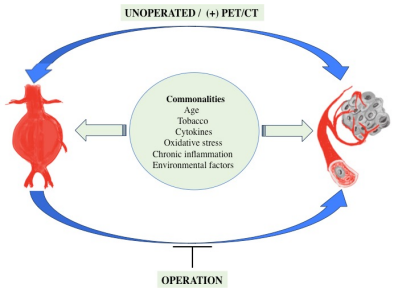
ORIGINAL RESEARCH ARTICLE
Risk and Prognosis of Cancer After Lower Limb Arterial Thrombosis

Take home message



- We have shown that PET positivity of AAA, reflecting local aortic inflammation, is associated with an increased cancer risk.
- Our data also indicate that the open surgery for AAA, which reduces inflammation, is associated with lower cancer occurrence.

Take home message

These findings will need to be supported by larger studies and the inclusion of translational explorations.

Despite the limitations, we are convinced that our data could:
- guide physicians in the long-term treatment of AAA patients;
- make them aware that cancer and AAA, two diseases involving inflammatory processes, have probably common pathogenic mechanisms.