
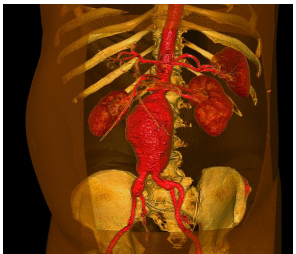


VEITH SYMPOSIUM
Connecting The Vascular Community




Computer Analysis Of CT Factors Determining Wall Weakness In AAAs Predicts Rupture Risk Independent Of Size : The VITAA System



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Disclosure: CMO and Co-Founder



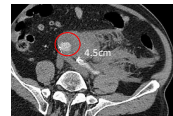

Circulation
Volume 138, Issue 11, 12 March 2018; Pages 1371-1380
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ORIGINAL RESEARCH ARTICLE

Safety of Men With Small and Medium Abdominal Aortic Aneurysms Under Surveillance in the NAAASP

CLINICAL RESEARCH STUDIES | ABDOMINAL AORTIC AND ILIAC ARTERY ANEURYSMS | VOLUME 77, ISSUE 6, P1649-1657, JUNE 2018

Characteristics and 1-year outcomes of patients with rupture of small abdominal aortic aneurysms



For J Vasc Endovasc Surg (2018) 31, 511-516

Rupture of Abdominal Aortic Aneurysms in Patients Under Screening Age and Elective Repair Threshold

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12% of patients have a rupture below size threshold!

Natural History of Large Abdominal Aortic Aneurysms (AAA) in Patients Without Timely Repair

Multicenter retrospective cohort study 3248 patients with large, unrepaired AAAs

3-Year Cumulative Incidence of Rupture

AAA*	AAA	AAA	AAA
5.0-5.4cm	5.5-6.0cm	6.1-7.0cm	>7.0cm
3.4%	2.2%	6.0%	18.4%

Total: 3248 patients
Repaired: 205
Not Repaired: 3033

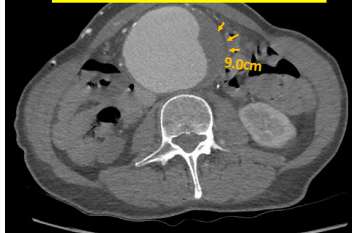
*Women Only

Annual rupture rates of large AAAs were lower than previously reported, with possible increased rupture risk in women.

JVS Journal of Vascular Surgery
Lancaster et al. J Vasc Surg January 2022
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How do we explain the widely varying reports?

Our reliance on AAA size to risk stratify is FUNDAMENTALLY FLAWED:



We need to analyze the aortic wall!

Finite element analysis:

Stress-based indices
(calculated forces on the aortic wall)

Does not take into account
the individual tissue
strength

Cardiovascular Engineering and Technology
<https://doi.org/10.1007/s13239-024-00757-9>
 October 28, 2024

Software engineering
Based on aortic tissue wall strength

Total Aortectomy

Intraop processing by engineering team based on sampling grid

Precision Aortic Assessment

Cardiac-Gated CT Scan

VITAA Cloud

Intraluminal Thrombus analysis

CFD Fluid analysis

Wall deformation (Peak Strain)

AI-based analysis

VITAA RAW Maps™ System
“virtual touch AA”

High RAW Score = Tissue Weakness

The RAW Score™
Regional Aortic
Weakness

Virtually assess the
mechanical
properties of AAA.

Research Use Only.

AAA wall analysis that
includes wall tissue strength
characteristics

4.65cm
diameter

ANT LAO Left LAT LPO RAO Right LAT RPO

RAW Score
10.0
7.50
6.50
5.00
2.50
0.00

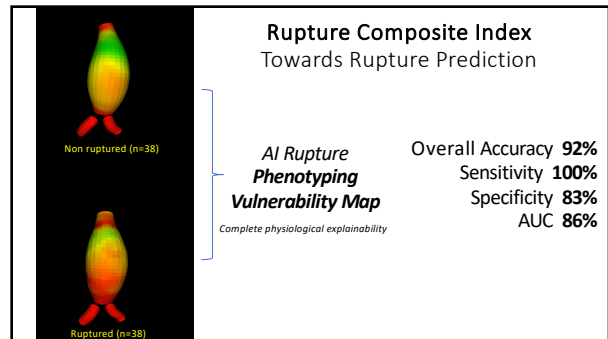
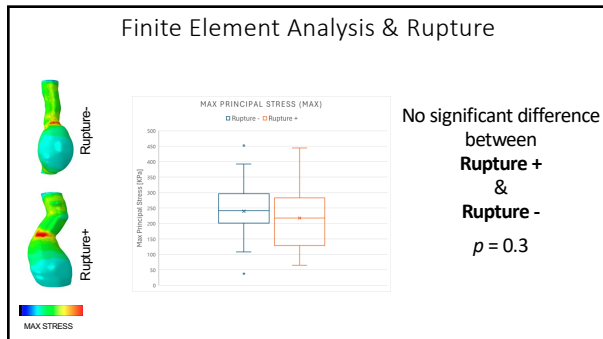
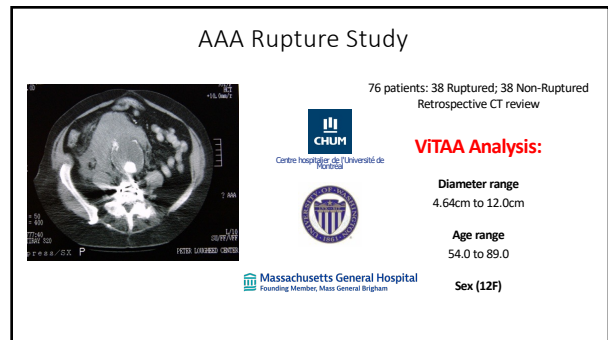
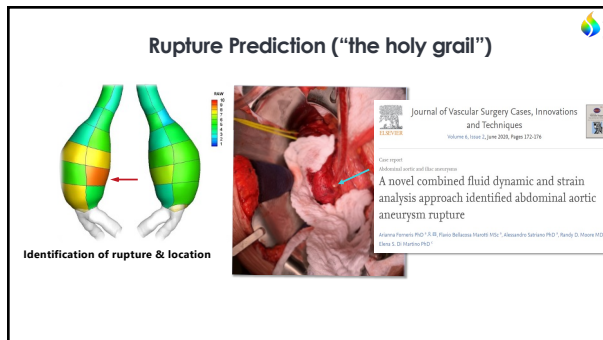
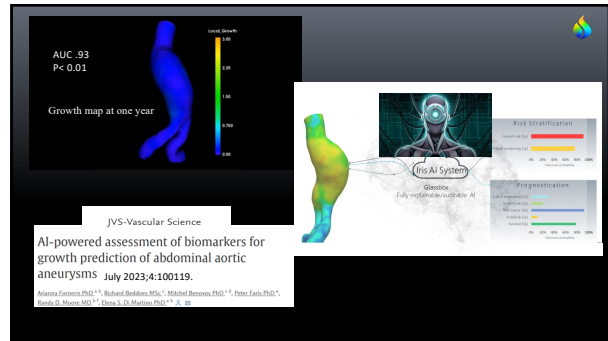
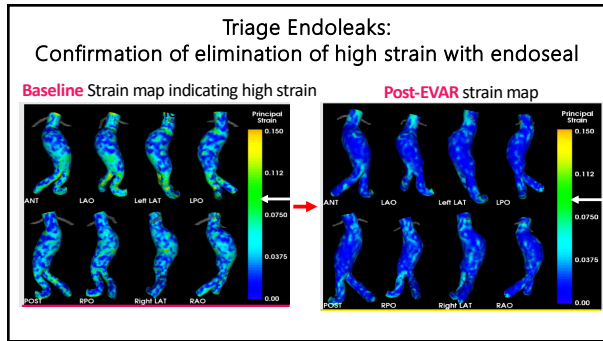
AAA Neck Landing-Zone Analysis

Increased neck RAW/Strain:
Increased Type 1 endoleak
N=16
P<0.05

PRE-OPERATIVE FUNCTIONAL CHARACTERIZATION OF AORTIC NECK IN
ABDOMINAL AORTIC ANEURYSMS AND ITS ASSOCIATION WITH TYPE I
ENDOLEAK FOLLOWING EVAR PROCEDURE

A. Fomaris (1,2), A. Satriano (2), R. A. Beddoes (2), R. D. Moore (1,3), E. S. Di Martino (1,2)

Summer Biomechanics, Bioengineering and Statapult Conference
June 8-9, 2018, CO, USA



Augmented Reality Interface with haptics to virtually "touch" the aorta

Centre universitaire de santé McGill
Institut de recherche

McGill University Health Centre
Research Institute



The image shows a person in a blue lab coat wearing a VR headset and haptic gloves. They are interacting with a laptop that displays a 3D model of an aorta. The person is holding a haptic device that provides tactile feedback. The background shows a clinical or laboratory setting.

Conclusions:

AAA wall analysis based on tissue strength allows for patient-specific wall maps.

Rupture prediction algorithms that will enhance patient selection for repair

No longer exclusively reliant on aortic size to determine care.



The image shows two surgeons in an operating room. They are wearing AR headsets and are looking at a patient's aorta. The AR overlay shows a 3D model of the aorta with a color-coded wall analysis. The logo for VITAA (Vascular Intelligence Through Augmented Reality) is visible at the bottom of the image.

VITAA
Vascular Intelligence Through Augmented Reality
Research Use Only